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A nudge in the right direction? Gender-informed support by female business-incubation managers for female STEM-entrepreneurs

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ABSTRACT

This article critically analyzes the influence of gendered ascriptions and assumptions upon support offered by female business incubation (BI) managers to female STEM entrepreneurs. We draw upon the concept of nudges to illustrate how female managers guide female clients to behave, so as to navigate gendered challenges during the investment-readiness (IR) process. Using an interpretive ontology and social constructionist feminist epistemology, we draw upon in-depth, semi-structured interviews with female BI managers and female STEM entrepreneur clients. The findings illustrate that the gendered BI context encourages gender-aware managers to nudge clients towards behaviours congruent with prevailing masculinized norms, navigating rather than challenging gender-bias, to secure investment.

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SUSTAINABLE DEVELOPMENT GOALS

SDG 5: Gender equality

Introduction

Women entrepreneurs are under-represented in STEM sectors due to the masculinized contexts of STEM disciplines and entrepreneurship which, together, generate a hostile culture of 'double masculinity' (Kuschel et al. 2020, 1). This under-representation is mirrored within business incubation (BI) environments which, while contributing to venture success and regional development, are dominated by men as managers, advisors, investors and client entrepreneurs (Ozkazanc-Pan and Clark Muntean 2018). Yet contemporary analyses, recognizing BI's critical role in the survival and growth of fledgling-ventures, largely rest upon gender-blind assumptions regarding the context in which support is delivered and adopted (Marlow and McAdam 2015). Where masculinity is ubiquitous, it becomes normative and its impact, invisible.

Female STEM entrepreneur BI clients disrupt such normative relationships; gender becomes salient given their 'outsider' status whilst the nature of support offered reflects a gendered landscape (MacNeil, Schoonmaker, and McAdam 2022; Marlow and McAdam 2015). Emerging literature exploring this dynamic, focusses upon gendered relations between male incubation managers and female clients highlighting traditional gender power-relations are reproduced with women clients encouraged to behave as 'honorary men' to gain legitimacy (Marlow and McAdam 2012, 666). Subsequent studies confirm a normative gendered status quo is enacted and reproduced by male managers (Brush et al. 2019; Ozkazanc-Pan and Clark Muntean 2018); however, the approach of female managers requires

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investigation (Marlow and McAdam 2015). Gender norms and stereotypes also influence how entrepreneurs are guided when preparing for investment pitches, with similar performances regardless of sex, but the 'how' of this process is underexplored (Khurana and Lee 2023). This paper advances knowledge by focusing upon how female BI managers support female clients towards investment readiness (IR), crucial for venture survival and scalability.

First, we contribute to literature exploring the influence of gender upon entrepreneurship and innovation by offering a novel analysis of how gender informs the preparation of female BI clients towards IR by female BI managers in this gendered context. We explore the possible assumption that female BI managers may be more attuned to gender biases and work with female clients to either challenge bias or better equip them to successfully navigate (operate within) this gendered context. However, prevailing evidence suggests that women seeking advancement within masculinized careers typically deny or discount the impact of gender, even where evidence of bias is overt (Treanor, Marlow, and Swail 2021). Thus, female BI managers, in a similar amorphous position to other women in senior organizational roles who experienced gendered assumptions and ascriptions navigating gendered terrains, may accept or be blind to the gendered context within which they operate.

Our second contribution relates to a new theoretical understanding of how BI managers and advisors support clients towards IR, so they conform to gendered investor expectations while pitching. We explore how female BI managers actively shape client decision-making, behaviours and performances by drawing upon the novel notion of 'nudges', defined as '*any aspect of the choice architecture that alters people's behaviour in a predictable way without forbidding any options or significantly changing their economic incentives*' (Thaler and Sunstein 2008, 6).

Nudges are used to encourage individuals to adopt desirable behaviours (Baldwin 2014); they differ from advice in that they are more directive, promoting a given option with nudge delivery designed to direct individual behaviour accordingly. Advice, usually delivered impartially, permits an individual to determine their own course of action. Whereas advice is often disregarded due to bounded rationality, heuristics and other psychological factors, nudges are partisan and designed in consideration of such heuristics. Thus, when deployed, nudges maximize the likelihood that people will act in accordance with the nudger's preference (Hansen 2016). This raises concerns of manipulation (Baldwin 2014) due to nudges sometimes presenting a 'no-choice choice'. However, the concept and practice has travelled widely, being used to influence consumer behaviour (Baldwin 2014) and student behaviour in educational contexts (Damgaard and Nielsen, 2018).

While nudge theory as an analytical lens within entrepreneurship is relatively novel, it has been employed to analyze entrepreneurial education and learning (Dunne 2021; Neergaard, Robinson, and Jones 2021). We argue that it is an appropriate construct to frame this debate given the critical role of BI advisors in actively nudging their clients to enact what they believe are preferred behaviours to improve their chances of being seen as investment-ready by external stakeholders during pitches. Our gendered analysis of how BI managers support female STEM clients adds further complexity by analysing how nudge deployment might encourage the reproduction, navigation or repudiation of masculinized norms within gendered BI environments. This informs our underlying research question: '*How does gender inform female BI managers deployment of nudges to influence female STEM entrepreneurs in their efforts to present as investment-ready?*'

We begin by exploring antecedents of women's under-representation in STEM careers and entrepreneurship using a gendered postfeminist critique of BI environments (Treanor, Marlow, and Swail 2021), IR and pitching. Nudge theory (Thaler and Sunstein 2008) is introduced, exploring the gendered connotations of how the construct is enacted within BI by female managers. Having created the analytical framing, the paper discusses methodological approach before presenting findings; having discussed the gendered implications of our findings, we conclude by outlining implications for female STEM entrepreneurs, BI managers and policymakers.

Gender and STEM women's entrepreneurial activity

Gender is a social construction which differentially distributes power through network relations, generating a valorization process, disadvantaging women (Treanor and Marlow 2021). While acknowledging greater gender fluidity in the contemporary era, evidence confirms that normative gendered ascriptions and the gender binary remain powerful markers for expected behaviours and attitudes (Marlow et al., 2018). Thus, a strong association remains between men/masculinity and a preference for, and competence in, science, maths, technology and related careers (Ottemo, Gonsalves, and Danielsson 2021). Such gender-informed stereotypes and bias constrain women's STEM career progression and entrepreneurial activity.

Despite professional qualifications and discourses of meritocracy, gendered ascriptions favouring masculinity and men mean women must prove competence, it is not assumed (Treanor and Marlow 2021). Discrimination, rigid working-patterns, issues with legitimacy and unequal advancement mean women still prematurely exit STEM careers (Kuschel et al. 2017). Consequently, constrained accrual of requisite entrepreneurial capitals in employment limits subsequent STEM venturing and legitimacy (Kubberød, Jones, and Pettersen 2021; Malmström, Johansson, and Wincent 2017). The relatively few females engaging in STEM entrepreneurship face persistent gender biases which inform an established literature evaluating the impact of gender upon STEM women (Treanor 2022).

Given BI's critical influence upon STEM-based venture outcomes, the experiences of women entrepreneurs within BI were explored (Brush et al. 2019; Kuschel et al. 2020). Again, gendered ascriptions influenced experiences, shaping identity and legitimacy work (Marlow and McAdam 2015), access to investment (Malmström, Johansson, and Wincent 2017) and the nature of business support (Ozkazanc-Pan and Clark Muntean 2018). Despite this emerging literature, there is little knowledge about *how* these experiences and outcomes are shaped, by those whose expertise and advice are critical in supporting and moulding the embryonic venture and its founder[s] (Bergman and McMullen 2022). Yet, most entrepreneurs arrive to pitch adhering to the same rules, delivering similarly gendered performances (Khurana and Lee 2023).

We focus upon how female BI managers, who like female clients are exposed to gendered processes, support female STEM entrepreneur clients towards IR. This advances debate by exploring how, if and to what extent female managers recognize the influence of gender and how it informs how they guide female clients in the BI context; thus, we analyze the degree to which they reproduce or contest dominant practices and gendered expectations, with related implications. We contend a female BI manager's awareness of contextual gender biases will influence how they support female clients to present as investment-ready.

Business incubation, IR and pitching

BI is an umbrella term for business intermediary environments that share the aim of supporting fledgling ventures with scalable potential (BEIS 2017). In the UK, female STEM founders are scarce (Beauhurst 2023) and even more so within BI. Despite debate conveying BI as gender-neutral, it is a masculinized context where women entrepreneurs comply with, and adopt, prevailing masculine norms to present as legitimate (Marlow and McAdam 2015).

A key BI objective is supporting clients to become 'investment-ready' to maximize the likelihood of securing investment finance (McAdam and Marlow 2011). An investment-ready founder has '*knowledge about effective communication with investors and providing them appropriately structured and relevant information, being credible and creating confidence*' (EC 2009). Thus, an entrepreneur is investment-ready if they generate investor-confidence that they can manage money and markets to exploit the business opportunity.

The investment literature confirms that the entrepreneur is key to the investment decision (Mason, Botelho, and Zygmunt 2017). As equity investors are predominately male, homophily is

found to bind to gender bias to generate more favourable evaluations of male entrepreneurs (Boulton, Shohfi, and Zhu 2019; Edelman et al. 2018; Serwaah and Shneor 2021). Notably in Mason et al.'s (2017) study numerous quotes from investors frequently referred to a generic entrepreneur as 'he', indicating a shared masculine entrepreneur construction within the investor community.

Thus, gender influences perceptions of the competence of female STEM entrepreneurs and informs investor-assessments of their IR. Women are less likely to be awarded venture capital regardless of bid quality (Brush et al. 2019) due to gendered assumptions surrounding financial competencies and attitudes to risk (Cowling, Marlow, and Liu 2020). Even when women do attract investment, investor heuristics informed by gender bias result in women receiving lower valuations and less money, especially in male-dominated sectors where gender incongruity is greater (Kanze et al. 2020). Given this under-investment in female-founders, we contend IR is a gendered construct informed by the masculine entrepreneurial norm.

During pitching, investors focus more upon risk when appraising women-owned ventures but upon opportunity when appraising male-owned ventures (Kanze et al. 2018). Given the short decision-making timeframe afforded by pitches and the higher degree of risk associated with early-stage ventures, investors resort to heuristics and biases (Khurana and Lee 2023) including sex and gender bias (Brush et al. 2019) and gender stereotypes (Balachandra et al. 2019). Investors associate risk-taking and financial decision-making as masculine traits (Malmström, Johansson, and Wincent 2017; Marlow and Swail 2014) with the act of pursuing high-growth entrepreneurship and venture capital investment considered masculine behaviours (Gupta et al. 2009; Gupta, Wieland, and Turban 2019). This led to suggestions women should display stereotypically masculine characteristics (assertiveness and risk-taking) to attract investment (Gupta et al. 2009, 399) as investors are less likely to invest in entrepreneurs displaying feminine characteristics (Balachandra et al. 2019). However, moderating an individual's gender performance requires management of language, body gestures, interactions and dress (Duong and Brännback 2023). While women entrepreneurs 'use similar language styles and discourses that emphasise the performance of being confident, assertive, competent and charismatic' (Duong and Brännback 2023, n.a.) the higher pitch of their voice and bias against speech patterns typical among young women may create barriers to women entrepreneurs being perceived as competent and trustworthy by investors (Clarke and Healey 2022). The balance of evidence suggests that female STEM entrepreneurs would benefit from gender-aware mentoring within BI to develop convincing investment-ready profiles.

The task of shaping female nascent entrepreneurs to think, behave and present as investment-ready STEM entrepreneurs is undertaken by BI managers based upon their understanding of investor perceptions of an investment-ready, STEM-entrepreneur (McAdam and Marlow 2011). This shared understanding of what investors seek is informed by established symbiotic relationships between BI managers and investors; thus, part of the BI manager role is to influence the sense-making of fledgling entrepreneurs in terms of their understanding and conformance to investor expectations (McAdam and Marlow 2011). What remains under-explored, is *how* BI managers influence how female entrepreneurs perceive IR and amend their behaviours to comply with dominant approaches. To progress the debate, this paper draws upon the notion of psychological nudging (Thaler and Sunstein 2008).

Nudge theory

Nudges are commonly deployed by governments and policymakers to influence individual behaviour (Baldwin 2014) due to high benefit-cost ratios and positive results (Damgaard and Nielsen 2018). A nudge '*alters people's behaviour in a predictable way*' (Thaler and Sunstein 2008, 6); it is a behavioural change intervention that often imperceptibly influences people's choices, steering them towards what are deemed desirable outcomes. Thaler and Sunstein (2008) contend that individuals, constrained by bounded rationality, information asymmetry and heuristics which they use as a decision-making shorthand, often make poor decisions. Nudges are designed to utilize these

Table 1. Thaler and Sunstein (2008) Types of nudges.

Nudge Type	Description
Defaults	Encourage the desired outcome by requiring individuals to take active steps to ensure they avoid this outcome e.g. UK opt-out schemes for organ donation and pension contributions.
Persuasive, campaigning and counselling strategies	Can influence and shape decision-making e.g. instructing individuals from specific groups about particular behavioural barriers and the requisite skills to overcome those barriers has been shown to boost active decision-making capabilities and enhance desirable, positive outcomes (Grüne-Yanoff & Hertwig, 2016). Successive UK governments used this to improve attitudes towards entrepreneurship e.g. Cameron launched the 'Business in You' campaign in 2012 which was supported by policy following Lord Young's report (2014) encouraging universities to equip students with an entrepreneurial mindset and skills, leading to the promotion of entrepreneurship as a desirable career option.
Information mechanism	Informing individuals of potential negative consequences or errors that may arise from their current/expected behaviour may facilitate corrective action. Also, providing information on social norms and other people's performance, or information on their own performance that counters stereotypical expectations, can influence individual behaviours. The inclusion of personalized information has been shown to assist young women in overcoming biased negative self-perceptions and more accurately appraise their effort levels and abilities (Damgaard and Nielsen 2018).
Design approach	Placing the smoking area a distance away from hospital or work entrance doors and providing little shelter, for example, to deter smoking.
Commitments	Encouraging people to make a commitment to undertake an activity or course of action can increase the likelihood they will do so, for example, a heart health related charity might ask people to commit on social media to walk 10,000 steps per day in support of their cause.
Transactional shortcuts	For example, linking your credit card and your loyalty scheme to automatically collect points on credit card purchases.
Warnings and reminders	These discourage unwise actions and behaviours. Shocking images of cancerous lungs on cigarette packages were warnings about the effects of smoking. A notification to complete a tax return is a reminder. They are often used together e.g. reminding students to do their homework to avoid detention or reminding people to make healthy food choices to avoid obesity-related illnesses.

heuristics and habits to influence an individual's decision-making in specific ways that almost assures the desired decisions which, contrary to the definition, effectively limits an individual's choice options (Hansen 2016). Thus, governments have used nudges to stop people smoking and encourage pension-investment (Baldwin 2014).

Thaler and Sunstein (2008) classify seven distinct types of nudges: defaults, persuasive campaigning and counselling strategies, information mechanisms, design approaches, commitments, transactional shortcuts, and warnings and reminders (see Table 1); all aiming to steer behavioural change towards desired outcomes. Nudges may target automatic behaviour enacted without thinking (Type 1 nudge) or be designed to engage automatic behaviours to trigger reflective thinking (Type 2 nudge) so the subject decides to alter their behaviour. Both types of nudges may be deployed surreptitiously or transparently. Transparent, Type 2 nudges respect individual decision-making autonomy and encourage conscious behavioural change over time (Hansen and Jespersen 2013).

As noted, nudges differ from advice but also mentoring (Li 2018). Mentoring relationships support entrepreneurs through overt provision of information and advice by experienced mentors, to inform the entrepreneur's decision-making through reflection and learning over time (Radu-Lefebvre and Redien-Collot 2013). We contend nudges are an additional resource for advisors. Nudges represent the presentation of data, information, facts and advice, including successful role models and examples, deployed in a manner through programme design and advisor direction, to influence the understanding, decision-making and behaviour of fledgling entrepreneurs. As such, nudges provide shortcuts towards preferred behaviours as design, evidence and argument significantly sway acceptance and adoption of the recommended behaviour or action (Hansen 2016).

Thaler and Sunstein (2008) contend people need nudged '*for decisions that are difficult and rare, for which they do not get prompt feedback, and when they have trouble translating aspects of the*

situation into terms that they can easily understand'. This is akin to STEM fledgling-entrepreneurs, tasked with deciding a business model and value-offering which influence long-term viability, investment-attractiveness and scalability, without prompt market feedback. Consequently, they resort to heuristics in their decision-making given that the start-up process meets the four requisite criteria: information overload, novelty and uncertainty, intense emotions, and time pressure (Baron 1998). They also rely upon heuristics during pitches (Khurana and Lee 2023) seeking early-stage funding (Balachandra et al., 2021). Thus, STEM fledgling-entrepreneurs within BI would be receptive to nudges to present as investment-ready.

STEM entrepreneurship, investment and BI are all masculinized contexts, dominated by men and masculinized expectations surrounding behaviours and expectations (Marlow and McAdam 2015). Axiomatically, female STEM entrepreneurs wishing to appear investment-ready are disadvantaged given the gendered contradictions they present. We know female STEM entrepreneur BI clients are nudged by male managers to comply with the prevailing masculine culture (Marlow and McAdam 2015). Less understood is how gender informs female BI managers, similarly gendered subjects, deploying nudges to direct female clients to present as investment-ready.

Methodology

We draw upon an interpretive ontology and a social constructionist, feminist epistemology, an approach which seeks to understand people's constructions and performances of gender and the meanings they attach to their experiences. This qualitative study acknowledges gender as socially constructed, (re)produced through interactions between individuals and focuses upon the research question: *'How does gender inform female BI managers' deployment of nudges to influence female STEM entrepreneurs in their efforts to present as investment-ready?'*

We adopted a purposive-sampling approach, deliberately seeking female BI managers who supported female STEM BI clients, and female STEM clients as participants. Purposive sampling is appropriate for research where insights and understanding are sought as it identifies knowledgeable, experienced participants, producing information-rich cases and enhances data reliability and dependability (Bryman and Bell 2015). This approach supports our aim of theory-development rather than generalizability of findings to a population (Bryman and Bell 2015). Given female under-representation as BI managers, STEM entrepreneurs and BI clients, challenges in identifying a small and hard-to-reach population were anticipated. The NESTA UK BI database was checked with contact details added where available and 342 BI sites were electronically surveyed using Qualtrics® to identify potential participants via questions about a) BI manager sex, b) STEM female entrepreneur clients, c) BI manager willingness to be interviewed and d) to facilitate introduction to STEM female-founder clients. In relation to sex, the options provided were 'Male, Female, Other, Prefer not to say'; no respondents selected either of the last two options. This survey also asked for a breakdown of staff, service provision and terms.

A low response-rate was anticipated given the scarcity of female STEM BI clients in the UK (Beahurst 2023) and low participation-rates in gender research by BI managers (Ozkazanc-Pan and Clark Muntean 2018¹). As the primary purpose of this survey was to identify participants for a qualitative study survey, we were not disheartened to receive 41 BI manager responses (12% response rate). Of the seven responding female BI managers, only four had directly supported female STEM clients and were equipped to provide relevant insights to address our research question. Some BI managers did not directly advise clients, focussing upon BI management and employing (usually) male advisors; additionally, most female BI clients did not have STEM businesses. Based upon manager referrals, we identified five female STEM entrepreneur clients willing to participate, affording data-triangulation (Denzin 1978; Patton 1999).

Empirical material was drawn from in-depth interviews with women managers who designed support offerings and worked directly with client entrepreneurs facilitating access to valuable networks and potential stakeholders and acted in a consultancy capacity, advising clients on how to

Table 2. Women BI manager sites.

	Industry Specific/ Mixed	Cost to Entrepreneurial Participants: Rent/Equity/Free	Gender Breakdown of Business Advisors/Mentors	Female Tenant (%)
Thelma BIM1	Mixed	Free	Predominately Male	25
Louise BIM2	Industry specific	Rent	Predominately Male	23
Meredith BIM3	Industry specific	Free	Predominately Male	20–32%
Christina BIM4	Mixed	Free	Predominately Female	30% +

Table 3. Women entrepreneur profiles.

	Client of	Sector	Age	Established	Founding Team	Funding	Employees	Other Women Founders Reported
E1 Sheila	BIM 2	Biotech	25	2 years	Sole Founder	£3000 seed 1st round VC imminent	1 intern	1
E2 Kim	BIM 1	Life Science	41	5 years	Sole Founder	Seed	0	4
E3 Kath	BIM 1	Life Science	42	5 years	Sole Founder	Preparing for 1st investment round	0	4
E4 Anna	BIM 4	Tech	27	3 years	Co-Founder	Angel Investment	4 FTE	2
E5 Bronwyn	BIM 3	Medical	26	5 years	Co-Founder	Seed; grant/ competition; VC funding	9 FTE	5

present as credible entrepreneurs and pitch their ventures as investment-ready. Interviews were undertaken at BI premises and/or remotely.

As we cannot assume female managers would recognize or accept that BI is a gendered environment, we did not ask for specific examples of gendered nudging but explored whether managers perceived gender as influential in BI sites, the client support process or entrepreneurial behaviour. Some managers acknowledged gender issues, discussing them in depth. In other instances, we drew upon extant evidence regarding the impact of gender upon STEM women BI clients (MacNeil, Schoonmaker, and McAdam 2022; Marlow and McAdam 2015) and our expertise in gender theories to interpret information shared by BI managers and interrogate the influence of gender in informing specific behavioural nudges (see Table 2: Overview of BI sites.)

Additionally, five semi-structured interviews were undertaken with female STEM entrepreneurs who were asked to discuss their experiences of BI and how working with the BI managers influenced venture development. These respondents were aware that interviews were exploring the experiences of female STEM entrepreneurs, so we raised gender-related issues in an exploratory fashion to instigate conversation. Table 3 provides respondent profiles. Interviews, lasting between 90 and 120 min, were recorded and transcribed. Follow-up interviews to clarify or further investigate comments and responses from initial interviews lasted 30–45 min, were recorded and transcribed, resulting in interview data spanning 20 h 49 min.

Interview data were thematically analyzed using a latent coding approach facilitating deeper-level analysis (Braun and Clarke 2006). Following transcript read-throughs for data-familiarization, initial codes were assigned; these were reviewed and organized around themes. Some initial codes and themes were informed by literature-informed, interview questions. Codes and themes were reviewed for consistency with themes named and defined at this stage (Braun and Clarke 2006). BI

Table 4. Coding excerpts: sample coding with indicative quotes.

(A) BI Manager Coding Excerpts Indicative Quote	Level 1 Codes	Level 2 Codes	Theme
'No. They all have similar business needs – marketing, finance, learning not to focus only on the science but to explain the USP'. [BIM1]	No difference between sexes in business needs	Reproducing the Status-quo /Maintaining traditional BI approach and offerings	Gender blind approach to BI management/ business support
'There is no difference in business-support needs of female clients' [BIM2]			
'the two girls that are running the company, I call them the girls which is terrible, everyone calls them the girls because you never see one without the other and they know I don't mean it in a disparaging way'. [BIM2]	Gendered discussion of clients	Discourse Maintaining/ reproducing masculine BI culture	
'women just need a bit more of a push to get themselves out there' [BIM1]	Contradiction: Gender irrelevant but relevant	Gender denial	
'women are accepting which can make life easier for me but isn't always helpful for them, so I do encourage them to speak up more, you know, have more presence, more pizzazz' [BIM2]			
'I like to support people I see working hard to develop their business; that's all they need to do to make it. That's what they all need to do to make it. They have to want it enough and work at it'. [BIM1]	Agentic view of entrepreneurship	Reproducing neoliberal/ masculine discourse of entrepreneurship	
'Investors tend to look for the same sorts of information; we make sure the entrepreneurs provide that information and are prepared for the pitches and negotiations'. [BIM1]	Investor expectations	Information nudge	Investment readiness
'A lot of it is helping them understand that they can negotiate, and they have every right to negotiate! And giving them the skills and the assertiveness for them to conduct those negotiations with potential funders or investors. All of them, but particularly females'. [BIM3]	Women as reluctant negotiators	Gender differences in Investment readiness mentoring support	
'STEM women entrepreneurs are not risk averse or reluctant to forfeit a stake in their business; they realise that is a necessity ... but they do have greater issues with negotiation'. [BIM3]	Women not equity averse		
'I've mentioned the lack of confidence. They are so capable, but the women need encouraged to believe the numbers and ask for that. They require more support around negotiation. Women are not supposed to be confrontational or argumentative, we are supposed to be compliant and submissive; I think that socialisation really underpins women's initial reluctance to engage in, and difficulty with, negotiation. Plus, it's impolite to discuss money! Women clients need more support and preparation for this'. [BIM4]	Gendered socialisation/ prescriptive gender performance expectations	Warning and reminder nudge	Women disadvantaged as gendered actors

(Continued)

Table 4. (Continued).

(A) BI Manager Coding Excerpts Indicative Quote	Level 1 Codes	Level 2 Codes	Theme
‘They have to come across as a confident, capable entrepreneur who can execute well and exploit the opportunity – sometimes women find that more challenging’. [BIM4]	Women distanced from entrepreneurial norm	Performance as entrepreneur	
‘Sometimes you have to remind them to stand firm on their ask, at least for a while’. [BIM 2]		Warning and reminder nudge	
‘The world of investment is not dissimilar to the world of [STEM discipline] when it comes to male domination. A lot of founders find it quite tricky talking to, or working with, investors. Again, it comes down to confidence and self-belief. It’s tricky; it’s not easy and it’s not always straightforward’. [BIM 3]	Investment – male dominated Women – lacking confidence/performing for investors	Guidance as to self-presentation	Investment arena male dominated
‘They know me, they know the quality of the people I admit here, and they know I won’t be putting anyone in front of them who isn’t ready or doesn’t have a viable business with good potential; so, I get good support each year from the investor community’. [BIM2]	BI reliance on Investors Investor confidence in BIM	Manager-Investor relationship	BI Managers constrained due to reliance on Investors
(A) STEM Women BI Clients excerpts ‘I just couldn’t have navigated the entire process without that support . . . I really needed that intensive direction . . . I would never have portrayed myself as a competent, credible entrepreneur or conveyed the opportunity . . . to investors to . . . secure funding’. [E5]	Performance of ideal type	Pitching – Performing to investor expectations of investment-ready entrepreneurial norm	Directed to navigate gendered context – Reproduction of gendered norm
‘It was like a mantra: “louder, slower, lower” – until I pitched appropriately (pun intended), with a well-rehearsed, relaxed smile. Plus, I had to know my numbers backwards; better than anyone else in the room!’ [E4 Anna]	Gendered nudge – voice		
I was advised about what to wear – ‘nothing too girly’, perhaps a dark trouser suit with a nice blouse . . . She said, you don’t want to look like you’re totally trying to look like a guy but you want to be conservative so they can trust you with their money. [E3]	Gendered nudge – dress		
‘It’s gotten a lot better now; I think it’s a lot better than it used to be years ago’ [E2 - Discussing women’s representation in BI]	Historicising gender issues in STEM	Gender Blind	Postfeminist sensibilities
‘I see a lot of girls – more than I used to. There’s a few girls working in different companies and there’s another female founder here too’. [E2]	Improved women’s representation – as employees		
‘I don’t think it matters. I think it’s hard for everybody. It’s just a lot of hard work that’s needed’. [E3]	STEM entrepreneurship gender neutral		
‘Gender really matters; sexism still exists. The world of business and [STEM] is so male dominated. I see it, I don’t know how others don’t or choose not to’. [E4]	Male dominated environments	Gender aware	Gender informed navigation
‘I’m a feminist and when I consider the whole intersectional perspective, it’s depressing’ [E4]	Multiple disadvantages		

(Continued)

Table 4. (Continued).

(A) BI Manager Coding Excerpts Indicative Quote	Level 1 Codes	Level 2 Codes	Theme
'I was schooled really well – I knew my stuff; knew my numbers inside out. I was fluent in all the relevant terminology (laughs). I was feeling quite confident; I knew there was a real opportunity here; we'd won a few awards, attracted some good press – all the ducks were aligned. I was networking the room and it was going well. Then, unexpectedly, one guy says to me, 'it's a good idea and everything but I would never invest in a woman-owned business'. . . . we were told about the whole investment thing; how women don't get the same investment; old fashioned sexism is still alive and well' [E4]	Overt Investor sexism	Recognition facilitates deflection vs self-blame.	Discrimination trumps all

manager and client interview data were coded separately; client interview data were contrasted with corresponding BI manager interviews to identify anomalies (see sample coding excerpts in Table 4).

Findings

Findings begin with an initial analysis of how the BI managers perceive generic gendered issues, as context for analysis of how gender informs their support-provision. Thus, managers were asked if they considered gendered differences existed between male and female clients in terms of approach to business start-up and growth, support requirements and services accessed. We then explore the deployment of nudges by female managers upon female clients when supporting them towards IR.

Incubation, gender and support

When asked '*do you ever notice differences in the support requirements of male and female clients?*', two managers denied gendered influences, claiming agentic effort was determinant of success. Thelma commented, '*No. They all have similar business needs . . . people . . . working hard to develop their business; that's all they need to do to make it*'. Louise agreed '*there is no difference in business-support needs of female clients*'. As noted elsewhere, gender denial is often qualified with examples of gendered behaviours and biases (Treanor, Marlow, and Swail 2021). Thelma later reflects '*women just need a bit more of a push to get themselves out there*'. While Louise, discussing Covid-related restrictions, characterizes women clients as more understanding and compliant given men, '*were less used to being disappointed or told, "no" in life*' and so, were more challenging.

Although stating gender was irrelevant, both later mentioned female clients differed from male contemporaries in terms of confidence which impeded their networking. Consequently, they employed nudges to direct women towards more confident behaviours when networking with key contacts. Thelma gave the women '*homework*' to help overcome gender-related, confidence-deficits, requiring they '*do some background research . . . read their website, interviews . . . find out their hobbies and interests . . . Then . . . start a conversation with them, don't be shy and retiring*'. This *persuasive campaigning and counselling* nudge was supplemented by *warning and reminder* nudges about their physicality, '*No shrinking wallflower routines today - head up, shoulders back and down, stand tall – act confident and relaxed . . . Fake it till you make it*'. These comments draw upon and reproduce stereotypical characteristics mapped onto femininity – the shy, reserved, passive, submissive woman – directly oppositional to the normative masculine assertive, charismatic, agentic

entrepreneurial construction (Ahl 2006).

Similarly, Louise said,

I made them watch a TEDx talk about Power poses, they can make women ... more confident. I made them promise to do that before ... a networking event or important presentation and I used to remind them they'd promised.

Louise uses a *warning and reminder* nudge to remind the women that they made a promise (i.e. a *commitment nudge*) to engage in the power poses they had learnt about through *information, and persuasive and campaigning nudges*, to alter their behaviour and perform more confidently with potential investors. Repercussions were explained in terms of investor-confidence, Louise stated in a follow-up discussion, '*They need to inspire confidence in the investor that they can be a successful entrepreneur, make sales and create confidence in the market. They're not going to do that by being the shy girl who can't engage them in conversation the way the guys ... will*'.

While denying gender influences business needs or support, these managers acknowledge sex-based differences, describing nudges deployed to direct female clients from essentialist tendencies towards behaviours expected of the normative, confident entrepreneur within BI and investment contexts. Effectively, these nudges ensured women conformed with prevailing masculinized benchmarks, thereby maintaining and reproducing these.

Meredith and Christina acknowledge gender differences among tenants which informs their deployment of nudging as early as recruitment. Christina states:

I want to have the best clients who have great business ideas – I didn't want to be losing out ... all because the girls just need a bit of a nudge. There are key decision gateways ... it's clear ... women need some additional direction to encourage them to move through those. So, there are differences in how support is offered between male and female clients here'

Meredith and Christina considered STEM female-founders tended to have perfectionist tendencies, lack confidence and be reluctant to apply for support without fully developed business-plans. Cognisant of gendered behaviours, they designed recruitment material to present their BI environments as 'women-friendly'. Meredith highlights:

the wording we use, the graphics we use ... the colours ... we put quite a lot of effort in to make sure that we are not communicating in a way that is going to make women not want to apply to our programme ... In our documentation for prospective applicants, we always say that we do not expect them to get everything right ... we are here to help with that ... women struggle with that more than men. (Meredith)

The BI managers use this *information mechanism* nudge (Thaler and Sunstein 2008) combined with role-model usage to nudge STEM women to overcome a behavioural reluctance towards BI-uptake due to concerns regarding 'fit'. Christina deployed further nudges such as workshops outlining imposter-syndrome (Goodman 2021) and strategies to overcome it, to adjust the women's behaviour, so they modelled the requisite attitudes and actions to present themselves and their business idea appropriately and secure BI support.

Nudging STEM women towards IR

A key strand of BI client-support focuses upon preparation for investment pitches. All BI Managers advised their clients about investor information-requirements and how to appropriately structure and convey this within business-plans, pitch-decks and presentations. Thelma highlighted: '*Investors tend to look for the same sorts of information; we make sure [they] provide that information and are prepared for the pitches and negotiations*'. All managers offered rehearsal, feedback and informal, individualized advice about documents and pitches to all clients. However, being considered investment-ready requires more than providing relevant information; the challenge for women is being perceived as '*credible and generating confidence*' among investors (EC 2009). As noted earlier,

gender stereotypes inform perceptions that women are less financially competent (Cowling, Marlow, and Liu 2020) resulting in a reduced likelihood of equitable investment (Kanze et al. 2020).

BI managers did not report gender bias or discrimination among investors during interviews. Instead, they discussed female clients facing ‘additional challenges’, mainly deriving from their lack of confidence and assertiveness when pitching and negotiating valuations and equity. Both Meredith and Christina admit to deliberately influencing client behaviours so that behavioural tendencies, stemming from gendered socialization, did not constrain performance outcomes. Meredith highlights, *‘it is helping them understand that they can negotiate ... have every right to negotiate! And giving them the skills and assertiveness to [negotiate]’*

All BI managers prepared female clients through providing *informational nudges* about the ‘rules of the game’ and regularly deploying *warnings and reminder nudges* (Thaler and Sunstein 2008) about ‘giving away’ valuable shares in their business and future profits. Only Christina raised client-awareness that women may have gendered tendencies to be reluctant negotiators. Use of these nudges was supported by individual advice and mentoring about fair valuation outcome ranges to inform negotiations. Despite not acknowledging gender differences in client needs, Thelma and Louise adopted similar strategies and tactics with female clients who *‘lacked confidence’* (Louise). The only difference was a lack of explanation surrounding gendered behavioural tendencies in interviews or to clients; these managers may not recognize the gendered nature of the entrepreneurial performance they were encouraging.

Given the importance of IR, preparatory work was also undertaken to ensure client-readiness for informal conversations that inform candidate appraisal in investment decisions. Meredith outlines the challenge for many women:

The world of investment is not dissimilar to the world of [STEM] when it comes to male domination. A lot find it quite tricky talking to, or working with, investors ... it comes down to confidence and self-belief.

Similarly, Christina says, *‘They have to come across as a confident, capable entrepreneur who can execute well and exploit the opportunity – sometimes women find that more challenging’*. Consequently, direct guidance on behaviours to emulate (confidence) and avoid (shyness or timidity), representing both *counselling* and *warning nudges* (Thaler and Sunstein 2008), were deployed. Despite not acknowledging gender differences, Thelma concedes, *‘women don’t have those same conversation topics to fall back on and so, they lack confidence; they have to prepare more to come across well’*; which explains the ‘homework’ she gave female clients. It is interesting that these issues are framed as a ‘lack’ in the women (confidence and self-belief). They are then nudged to overcome these essentialist deficits to present as investors would expect. That is, they are nudged to navigate not challenge gendered norms through self-regulation (Treanor, Marlow, and Swail 2021), echoing literature that highlights how nudges encourage accordance with, not challenge of, the dominant values and standards underpinning desired behaviours (Hansen 2016). However, within normative constraints, these initiatives do acknowledge gender as a constraint, albeit for negotiation.

Consequently, even when female managers are sensitive to gender bias, they use this awareness pragmatically to assist clients in navigating such biases by performing to investor expectations to secure finance while bolstering the reputation of the BI. Investors are less likely to maintain BI connections if not introduced to credible investment-ready clients; Louise conveys:

They know me, they know the quality of the people I admit here, and they know I won’t be putting anyone in front of them who isn’t ready or doesn’t have a viable business with good potential; so, I get good support each year from the investor community.

The focus, therefore, is upon preparing clients to perform for investors and behave ‘appropriately’ through deployment of nudges. In BI environments, when time-pressured clients are focussed upon making a short but powerful pitch, there are limited opportunities for the reflexive-learning

supported by extensive mentoring (Radu-Lefebvre and Redien-Collot 2013). Instead, there is greater reliance upon heuristics which, in turn, maximizes the likelihood entrepreneurs will comply with direction given, from BI manager nudges, as they seek to present as investment-ready. Thus, during BI fledgling-entrepreneurs are nudged to learn the ‘what’ and ‘how’ of being an entrepreneur to establish entrepreneurial legitimacy (Swail and Marlow 2018). STEM women BI clients, seeking to be perceived as investment-ready, are nudged to attenuate the feminine traits and emulate more masculine pitch performances (Balachandra et al. 2019; Swail and Marlow 2018), as client accounts illustrate.

STEM women entrepreneur client perspectives

This section draws upon female STEM BI client discussion about their experiences of BI manager support towards IR, focussing upon pitch-preparation.

Anna, founder of a multiple award-winning venture, reflected upon the direction provided about her presentation style during pitch-preparation, *‘It was like a mantra: “louder, slower, lower” – until I pitched appropriately (pun intended), with a well-rehearsed, relaxed smile. Plus, I had to know my numbers backwards; better than anyone else in the room!’* This overt *commitment nudge* to modify voice in terms of tone, pitch and speed to sound less feminine is informed by gendered investor expectations and bias (Balachandra et al. 2019; Clarke and Healey 2022) which reproduces such norms. Subsequently asked why she needed to be better prepared in relation to the finances than others [men], she replied: *‘Christina had said about women not getting money as much as men ... she said they might grill me more on my numbers because I’m a woman! ... so, I rehearse, ... do what she tells me, so I have the best chance’.*

The *persuasive and counselling nudge*, accompanied by *warning and reminder nudges*, ensured Anna could be confident, presenting as competent in financial aspects and negotiating equity, which in turn enhanced her entrepreneurial credibility. She understood *‘fumbling or making mistakes on the financials would jeopardise investment’* as it may reinforce investor bias that women are less capable and pose a greater investment risk (Cowling, Marlow, and Liu 2020).

Bronwyn, attributing success to Meredith *‘pushing me along’*, says:

I just couldn’t have navigated the entire process without that support ... I really needed that intensive direction ... I would never have portrayed myself as a competent, credible entrepreneur or conveyed the opportunity ... to investors to ... secure funding.

Notable here is the reference to receiving ‘pushes’ throughout the process from recruitment nudges to the BI manager’s influence upon her impression management, that is, her personal portrayal as *‘a competent and credible entrepreneur’* to investors. The language suggests performance to an ‘ideal type’, to a shared understanding or construction of an investment-ready entrepreneur. During a follow-up interview, she outlined the guidance given to enact that performance.

... there were all those memes ‘Be more like Bob’. [Here] Bob was a confident, well-educated scientist offering investors an incredible business opportunity to invest in. Me, I was more like Jane ... a nervous imposter, ‘too apologetic’, spoke ‘too softly’ and didn’t ‘exude enough self-confidence and enthusiasm’ to instil confidence or enthusiasm in investors. I was told ... to be more like Bob!

Bronwyn received a combination of *information* and *persuasive and counselling nudges* to advise her of gendered behavioural tendencies contrary to normative gendered expectations. She was advised to modify her behaviour and to act in a specific gendered way when pitching and speaking to investors to enhance the likelihood of investment (Gupta et al. 2009). Similarly, Kath was moulded into an investment-ready entrepreneur but found the process personally challenging:

I had to realise ... that growing a business, there is business development but there is also personal development that goes along side that ... I was instructed in how to ... be and what an entrepreneur should do, in the way investors and clients expect.

In a follow-up interview, Kath was asked what guidance she received:

[Thelma said] ... I had to be more confident and assertive without getting shrill or coming across as a difficult woman. As she said, you've to do it in a firm but personable way, so they would perceive me as someone they could work with. She practised with me until ... I looked, sounded and felt confident defending my valuation ... without my voice trembling or going high-pitched or coming across as difficult.

She was advised to dress 'professionally', to wear '*nothing too girly*' but '*a dark trouser suit with a nice blouse ... you don't want to look like you're totally trying to look like a guy ... you want to be conservative so they can trust you with their money*'. This resonates with findings that women are more likely to be rewarded in pitches when they comply with hegemonic models of masculinity tempered with a little emphasized femininity (Duong and Brännback 2023). In this case, Kath was steered away from both her quiet, deferential character and from over-compensating in case she would be perceived as timid and emotional or a difficult woman. Several women were told to lower their speaking pitch while slightly increasing the volume, echoing the suggestion that BI represents an induction process where women are moulded to comply with the male entrepreneurial norm (Marlow and McAdam 2015). When asked why they adhered to BI manager directives, the women generally agreed, '*they're the expert ... they're telling you what to do and how to do it if you want to succeed, so, you do it as you've been told to ...*' (Kath). Bronwyn said:

I knew nothing about this game at the start but I had an expert in my corner. Don't get me wrong she would always say, 'it's your business and your call but, if you want to secure investment ...' It's one of those no-choice choices - it was just a no-brainer for me, I did what she said because I wanted investment and a successful business.

These female entrepreneurs highlighted the benefits derived from BI, assisted through nudge deployment, which enabled development of appropriate business-plans and pitches and, by presenting as investment-ready, securing finance. However, this seemingly generic business support occurs within a gendered landscape. The women were aware of a shared benchmark of the credible entrepreneur against which they would be judged. All conveyed awareness that in seeking legitimacy, they could only be deemed credible, if they convinced the dominant referent group – investors – of their 'fit' (Ibarra and Barbulescu 2010) by conforming to the normative standard described by the BI managers. While such guidance may increase their client's likelihood of attracting investment, despite the training, coaching, direct advice and steers to ensure women matched their performance to masculinized expectations, gendered challenges in accessing investment persist. However, most clients minimized the significance of gender; Sheila said women's representation had '*got a lot better now*' with '*about ten or twelve*' other women within her BI. Yet, when asked, she revealed '*only one is a founder, the others work in other STEM firms*.' Female representation was mainly as employees, not founders, within BI client firms. Only one female STEM client interviewee identified as feminist, the others discounted the potential influence or contemporary relevance of gender. Only one BI manager overtly discussed gendered outcomes within this context with clients. Yet, as her client, recounted:

I was schooled really well...knew my numbers inside out ... was feeling quite confident; ... we'd won a few awards, attracted some good press ... I was networking the room and it was going well. Then, unexpectedly, one guy says to me, 'it's a good idea and everything but I would never invest in a woman-owned business'. ... old fashioned sexism is still alive and well.

Despite individual effort, guided by BI Manager nudges, overt discrimination cannot be countered through behavioural adaptation to prevailing norms; navigating the gendered context does not alter the structural challenges inherent therein for women. In the face of gendered challenges, the impact of nudges, to reshape gendered behaviour to befit normative expectations, rests upon the willingness of investors, to 'buy into' the notion that female entrepreneurs represent a sound investment.

This empirical evidence suggests BI managers deploy a suite of nudges when supporting female STEM entrepreneur clients towards IR. BIs facilitate entrepreneurial learning (MacNeil, Schoonmaker, and McAdam 2022), and BI managers mainly deployed Type 2 educational nudges such as information, commitments and persuasion and counselling nudges with combinations of these used in tandem. Many were deployed transparently highlighting gendered behavioural tendencies and strategies to overcome these tendencies, such as Christina's imposter-syndrome workshops.

Discussion

STEM entrepreneurship (Kuschel et al. 2020), BI (MacNeil, Schoonmaker, and McAdam 2022) and investment finance (Khurana and Lee 2023) are gendered domains which contribute to the under-representation of women as STEM entrepreneurs, their scarcity within BI and the gendered investment gap (Brush et al. 2019; Kanze et al. 2020). Understanding how to effectively support female STEM BI clients seeking investment is important for inclusive entrepreneurship and socio-economic development.

We advance the debate by critically evaluating the influence of gender when female BI managers, also under-represented, support female STEM BI clients towards IR. We analyze *how* BI managers prepare clients to present as investment-ready to investors during pitching; addressing calls from Khurana and Lee (2023) for understanding of how gender norms and stereotypes influence entrepreneur preparations for, and performance interactions during, pitching. To do this, we draw upon the novel concept of nudge theory (Thaler and Sunstein 2008), illustrating how gendered behavioural and performance adaptations by BI clients are encouraged through direction from BI managers, considered neutral experts in the field. Thus, in addressing our research question, '*How does gender inform female BI managers deployment of nudges to influence female STEM entrepreneurs in their efforts to present as investment-ready?*' we offer theoretical contributions with implications for BI advisory practice.

Specifically, we found evidence of the use of six nudges from pre-recruitment through application stage to pitch preparation, namely: defaults, persuasive campaigning and counselling strategies, information mechanisms, design approaches, commitments and, also, warnings and reminders. We use these different types of nudges to demonstrate the range and type of surreptitious influences deployed which cumulatively, shape behaviours. The notion of nudges is particularly useful as they illustrate how gendered expectations and advice are reproduced through subtle but encompassing directives. By using such nudges, the BI managers, even if aware of their gendered connotations, cannot act as change agents. In more detail, we find that nudges were only deployed at pre-application stage by gender-aware BI managers, which improved representation, but all managers deployed nudges when preparing STEM women clients for pitching and negotiations with investors. Sunstein's (2016) type-two, educational nudges were used extensively, frequently in combination; these were as follows: information mechanisms, persuasive campaigning and counselling strategies, commitments and warnings and reminders. For example, Louise used a commitment nudge to encourage clients to practice power-poses to enhance pitch performance. The persuasion and counselling nudge, in combination with an information nudge, informed women about their predisposition towards imposter syndrome and provided techniques to assist navigation of self-limiting decisions, so they might pursue STEM entrepreneurship within BI. These nudges were deployed transparently and may usefully be mainstreamed. However, other nudges were less transparent, seeking at the subconscious level to influence perception of potential fit by portraying BI as a welcoming environment, evident from Meredith's example of the design, wording, colour-scheme and use of female role-models in promotional materials. Concern surrounds nudges deployed in non-transparent ways (Leggett 2014).

Indisputably, male and female BI clients were advised as to the content of pitches and business-plan documentation. In terms of delivery, all nervous fledgling-entrepreneurs may tend to speak too quickly and be advised to slow their pace; however, these women were nudged in gendered ways to

present as investment-ready. Each was guided about the pitch and volume of their voice, resonating with earlier findings that women are advised to attenuate the feminine and emulate more masculine performances when pitching, to assist their intelligibility as credible, legitimate, investment-ready entrepreneurs (Swail and Marlow 2018). While these BI managers nudged their clients, male and female, these were gendered nudges encouraging females to perform and conform to the prevailing masculine entrepreneurial construction. Female clients received instructions around impression management, literally how to dress (a nuanced balance of entrepreneurial masculinity and femininity), speak (in relation to tone, pitch and volume), and 'how to talk to investors'. This was expressly to avoid enacting gendered stereotypes by appearing to lack ambition, confidence, assertiveness or financial acumen. In short, female clients were nudged to behave according to the privileged masculine entrepreneurial norm. Care was taken, however, to ensure they did not over-compensate and come across as aggressive or difficult, potentially leading to 'gender threat' whereby those (men or women) who stray too far from normative expectations are viewed with distrust (Butler 2011).

Thus, a tempered and nuanced gendered performance was advocated. We contend that this nudging around modulation of tone/volume and personal presentation to emulate the masculine norm was not transparent in its intent. In effect, such gendered norms are so deeply embedded and internalized that the women BI managers, regardless of their levels of gender awareness, may not be cognisant of the gendered underpinnings of these nudges. These gendered nudges, relating to presentation, may be considered superficial, relating to the performative; however, there is concern around subliminal messaging about fit. Marlow and McAdam (2015, 805) reported women clients made similar dress choices to 'blend in', we contend this may have been less of a personal decision than their respondents realized. Individually held thoughts, actions and behaviours are the result of interactions between individuals (Lindgren and Packendorff 2009); thus, nudges from BI managers directly influence their client behaviours and, through a social-learning ripple-effect, influence other women clients who, often subconsciously, observe and reproduce the context-specific, socially constructed dress norms. We contend, addressing Khurana and Lee's (2023) calls for greater insight into the process of *how* gender is reproduced during the preparation for and delivery of pitches, that it is the deployment of nudges that reproduces gendered norms and performances akin to the hegemonic masculine entrepreneurial norm in this context.

In terms of IR, preparing and 'matching' clients with potential investors occurs within a gendered landscape where potentially discriminatory investment preferences, based upon gendered views, persist (Kanze et al. 2020). Thus, to have a successful BI site the manager may feel compelled, regardless of their gender or gender awareness, to influence female clients to conform to male-patterned expectations unless or until investor gender awareness and behaviour might improve. Predominantly male investors, deploying heuristics informed by gender stereotypes and bias (Brush et al. 2019), will make decisions informed by homophily and conscious and unconscious basis (Khurana and Lee 2023). Consequently, such investors are more likely to discount higher-pitched female voices (Clarke and Healey 2022), meaning that such direction by BI managers may be the most practical and pragmatic means of assuring the best possible client outcomes within this highly gendered terrain.

It is lamentable that it seems only female entrepreneurs are directed to self-regulate to attain successful outcomes (Treanor, Marlow, and Swail 2021). The (typically male) investor community does not seem to be similarly nudged to raise their awareness of their gendered behavioural tendencies to discriminate against women entrepreneurs in their investment decisions (Khurana and Lee 2023). Nor are we aware of educational strategies being promoted to assist investors with countering those behavioural tendencies. This is despite evidence that more inclusive decision-making would ultimately benefit their returns on investment (McKinsey 2018). Unfortunately, success attained by clients performing to investor expectations reinforces investor bias and reproduces the normative entrepreneurial performance, towards which BI managers will continue to nudge future clients.

As most BI managers (of both sexes) do not recognize the contemporary influence of gender within this context, it seems nudges are unconsciously deployed. We suggest three implications for such gender-blind BI environments. First, there is the the probable continuation of STEM women's under-representation. The unacknowledged issue means many institutions do not establish targets for female clients which, in the light of evidence that women are 'discouraged applicants', suggests client gender disparity may persist (Ozkazanc-Pan and Clark Muntean 2018). Second, female clients unable to avail of information around potential gender-related behavioural barriers and instructional strategies to counter these may continue to experience barriers to negotiating improved outcomes. Finally, when unsuccessful in securing investment, awareness of gendered structural barriers and sexism could potentially prevent female clients from internalizing blame to the detriment of their wellbeing (Treanor, Marlow, and Swail 2021) and venture survival. This is poignant in a context characterized by stark under-investment in female founders (Kanze et al. 2020) as most gendered investment decisions will not be accompanied by overtly sexist comments that render them recognizable. Given concerns about the potential impact of a gender-blind approach upon STEM women entrepreneurs who experience gendered outcomes and internalize blame for their lack of success (Treanor, Marlow, and Swail 2021), we advocate open discussion of gender bias and 'home-work' for investors.

It is apparent from our findings that once STEM female entrepreneurs locate within BI, they are taught the 'rules of the game' which remain embedded in normative heteronormative masculinity. Although there is some sensitivity to this issue, the gender-aware approach employed by some female BI managers is not a clarion call to challenge the prevailing masculine culture but a means of forearming women to better navigate this gendered terrain. Consequently, the impact of such 'gender aware' approaches upon the gendering of the BI landscape remains marginal. However, it is hoped that it may also produce exceptional business outcomes for some of these trailblazing female founders who, consequentially, may garner new-found influence over the system itself and exploit their wealth, power and influence to advocate for system change, as has occurred elsewhere.²

Finally, while our research question focuses upon nudging, we are not suggesting that BI managers also do not provide advice and mentoring to their clients; instead, we highlight nudges as largely unrecognized tools within the advisory toolkit which may be deployed consciously or intuitively during time-pressured pitch preparation.

Limitations and future research

The limitations of our study offer scope for future research. We draw upon a restricted sample due to the extremely small population of STEM female-founders supported by female managers within UK BI environments, compounded by research-fatigue and low response-rates for gender-focused research (Ozkazanc-Pan and Clark Muntean 2018). A future larger-scale study, when greater representation is achieved, may provide insight into the representativeness of these nudging practices, how they map onto gendered issues in different contexts and how they may be deployed for entrepreneurial learning more generally, with the potential to measure their effectiveness individually and in different combinations. Within STEM entrepreneurship, there are tropes of normative masculinity (scientists, geeks, inventors, nerds, etc.) embedded in assumptions of heteronormativity. Future research could delve into expectations of masculinity within BI and how preferred enactments of masculinity fuel legitimacy. Analysing the experiences of queer and non-binary individuals would also be informative given cis-women clients appear to be guided towards masculine behaviours conforming to a hegemonic, heteronormative, masculine, entrepreneurial construction. 'Traditional' gender expectations and masculine performance expectations may prove a deterrent or create an exclusionary environment for queer and non-binary BI clients, meaning institutional practices are potentially excluding all citizens from accessing publicly funded support on their own terms.

Conclusion

We conclude our arguments by outlining our contributions to debate and theory development. Our novel synthesis of literatures covering heuristics and nudging, heuristics and pitching/IR, and nudges for entrepreneurial learning underpinned our critical exploration of the influence of gender upon the deployment of nudges by female BI managers supporting female STEM entrepreneur clients towards IR. We illustrate that nudges are deployed to influence BI client behaviour, decision-making and performance; our analysis advances understanding through highlighting the different types and combinations of nudges successfully deployed by BI managers to enhance both representation and outcomes of STEM women entrepreneur BI clients. Entrepreneurship is a learning process and our analysis shows educational nudges were deployed repeatedly, often transparently and frequently in combination, to guide client behaviour and performance to present as credible, investment-ready entrepreneurs; extending understanding of, and arguably making more transparent, the tools and mechanisms used within BI to support client learning and development.

We advance understanding within the gender and investment-finance literature of how *gender* informs support guiding female entrepreneurs towards IR and pitching performance, as per Khurana and Lee's (2023) calls. We illustrate gendered nudges are deployed to ensure female clients enact more masculine behaviours, performing to prevailing hegemonic masculine entrepreneurial normative expectations of investors. This analysis adds a power dimension to this debate, as nudges direct individual behaviour to comply with preferred behavioural norms (Baldwin 2014). This analysis reveals how normative assumptions about gender, or other ascriptions, become embedded and inform BI advisory relationships and support.

We offer insight into how the prevailing masculinized entrepreneurial discourse (Marlow, 2018), BI management and support (MacNeil, Schoonmaker, and McAdam 2022; Ozkazanc-Pan and Clark Muntean 2018) and investor expectations (Balachandra et al. 2019) coalesce to influence women within these environments. Whether as BI managers or clients, females are encouraged to conform to navigate this gendered terrain to maximize their fit and be successful. Regardless of the level of BI manager gender awareness, they deploy nudges to encourage female clients to navigate and conform to gendered expectations to maximize the likelihood of attaining investment. Thereby, women BI managers, in turn, maintain masculine institutional BI management norms and expectations.

Whether gender-aware or not, BI managers advocate success depends upon the agency of female entrepreneurs, given their deployment of nudges to encourage women's self-regulation and conformance to gendered benchmarks (Treanor, Marlow, and Swail 2021). Nudging individualizes responsibility for securing investment to individual women and their performance. It does not remove or challenge structural barriers or inequalities. Female clients, engaging in self-regulation and altering behaviours to be considered investment-ready, when rewarded with investment for successful conformance to this male template, internalize this as success. However, this becomes futile when they encounter discrimination (Treanor, Marlow, and Swail 2021). For those unsuccessful in securing investment, the concern is that obfuscation of structural gender bias would lead to internalization of blame to the detriment of personal wellbeing (Treanor, Marlow, and Swail 2021).

Currently, BI managers adopting a gender-aware approach can enhance female representation as BI clients. A combination of nudges, including design approaches, information mechanisms, campaigning and counselling strategies and warning and reminder nudges, appear effective in assisting women BI clients to overcome gendered self-limiting behaviours in relation to BI service uptake, negotiation and valuation as examples, and so, better equip them to consciously navigate this gendered context successfully. While mainstreaming a gender-aware approach deploying nudges encouraging conformity may deliver short-term benefits for individual women clients by facilitating investment, it has limited impact on challenging the prevailing gendered BI environment; rather, it embeds long-term detriment through reinforcement. It seems unlikely this can be undone in the short term given the reproducing effects of STEM and entrepreneurial discourses within the context

of growth-oriented firms unless a proactive programme of change to support inclusive entrepreneurship and innovation is undertaken.

One hopeful trend in the current policy and practice for broader equality and inclusivity relates to the emergence of 'Inclusivity Charters', documents authored by academics collaborating with policy-makers and practitioners [see, for example the Charter for inclusive entrepreneurship (Teanor and Burkinshaw 2023)]. Organizational signatories commit to acknowledge and address bias and exclusion, through an ecosystemic approach involving outreach initiatives to support inclusive recruitment, which could address the under-representation of women as BI clients and managers. Using this, and other bodies of evidence, to encourage the national representative body for incubators to consider and adopt such charter recommendations should be a priority and would address inconsistencies and dependence upon the outlook and reflexivity of individual advisors.

Notes

1. Only six BIs across New York, Boston, Chicago, Providence and Indianapolis would participate in a gender-focused study.
2. As examples, Forbes 2022 - <https://www.forbes.com/sites/rodberger/2022/11/23/growing-a-community-of-female-entrepreneurs-to-challenge-the-status-quo/>; Thestartupsquad.com 2018. <https://www.thestartupsquad.com/5-successful-women-entrepreneurs-who-give-back/>; Philanthropywomen.org 2022. <https://philanthropywomen.org/ceo-women/why-kendra-scott-gave-13-25-million-for-women-entrepreneurs/>.

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