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Anticipated chilly climate for women: The development and validation of a measure

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Abstract

Purpose: This study develops a measure of anticipated chilly climate for women and provides initial evidence of its validity.

Design: We draw on three studies. Study 1 consisted of three focus groups to gain deeper insights into the meaning of the concept to prospective female job seekers and generate scale items. In Study 2 we pre-tested job post vignettes (N=203) and refined the scale items and explored the factor structure (N=136). Study 3 aimed to determine the convergent and discriminant validity of the new scale (N=224) by testing its relationships with organisational attractiveness, person-organisation fit perceptions and gendered language.

Findings: The results show that anticipated chilly climate is an important concept with implications to applicants' career decision making and career growth in the technology industry, where women tend to be underrepresented. Perceptions of anticipated chilly climate comprises expectations of devaluation, marginalisation and exclusion at the prospective employment. The masculine stereotypes embedded in the language of the job posts signalled chilly climate for both genders, negatively affecting perceptions of fit and organizational attractiveness.

Originality: Most previous studies have focused on the actual experiences of chilly climates in organizations. We extend this body of literature to anticipatory climates and draw on social identity threat theory and signalling theory to highlight that job applicants make inferences about the climate they expect to find based on job ads. Specifically, they may anticipate a chilly climate based on cues from job ads signalling masculine stereotypes. While the literature has emphasized women's perceptions of chilly climates within organizations, our results show that both genders anticipate chilly climates with detrimental consequences for both organizations and prospective job applications.

Keywords: anticipated chilly climate for women; scale development; gendered language; job ads; gender stereotypes; career development; recruitment; social identity threat theory

Introduction

Organisational climate perceptions have been associated with a range of relevant organisational outcomes such as organisational commitment and performance (Berberoglu, 2018; Woznyj, Heggstad, Kennerly, & Yap, 2019), job satisfaction (Schulte, Ostroff, & Kinicki, 2006), and turnover (Li, Huang, & Chen, 2020) as well as work adjustment (Davies, Stoermer, & Froese, 2019). However, an organisation's climate can only be felt once individuals have joined the organisation. Drawing on signaling theory, we argue that individuals who are considering applying for a job make inferences about the climate of an organisation as they read and reflect on job advertisements. Job advertisements present an important tool through which individuals gather information and create first impressions about a potential employer (Muruganantham, Antony, & George, 2020), influencing their perception of fit with the organisation (Verwaeren, Van Hoye, & Baeten, 2017), organisational attractiveness and thus their intention to apply.

However, job ads are not often neutral and may contain words, which elicit explicit or implicit expectations of the gender of the ideal candidate. While the use of pronouns and gender-loaded words like "policeman" or "waitress" is subject to regulations in many countries, the use of wording associated with stereotypical feminine and masculine personal qualities, behaviors and attitudes continue to prevail across jobs and industries and influence the assessment of a potential employer (Hentschel, Braun, Peus, & Frey, 2021). In sum, individuals create expectations about the climate in an organisation based on their reading of a recruitment ad that in turn may influence their perceptions of fit with that organisation as well as the attractiveness of the organisation. We refer to this as "anticipated climate". Drawing on social identity threat theory, women tend to perceive organisations described with masculine-themed words as less appealing than those with feminine-themed words (Askehave & Zerthsen, 2014; Gaucher, Friesen, & Kay, 2011) as they may anticipate concerns devaluation, marginalization

and exclusion (Murphy & Steele, 2010; Murphy, Steele, & Gross, 2007). This is important as gendered language in job ads contributes to the persistent underrepresentation of women in certain sectors or positions (Wille & Derous, 2018). More specifically, through subtle cues women may feel less legitimate to apply, forming a barrier to their career advancement or inclusion in the workforce (Nater & Scesny, 2016; Miner, January, Dray, & Carter-Sowell, 2019), which in turn prevents organisations to tap into this talent pool (Dutz, Hubner & Peus, 2022). A scale on anticipated chilly climate can be used by HR personnel to assess the extent to which women anticipate that their gender is perceived to be a liability in the organization. More specifically, it provides information about whether women, and possibly also other minorities, anticipate being devalued, marginalized and excluded. This information could be a starting point to make changes to organizational policies, practices or structures. For instance, the scale could be used as a kick-off for a discussion about what exactly triggers these perceptions of anticipated marginalization, devaluation or mistreatment and how potentially unconscious bias can be reduced. Further, apart from the wording of a job advertisement, the skills that are being requested are not neutral and create another layer of bias that can be identified through the scale and followed-up with in-depth discussions with HR. This, in turn, could enhance the representation of various minority groups in higher level positions as the subtle cues that prevent these groups from applying are removed and could result in a more inclusive workplace for all.

Anticipated climate is important as not all individuals feel that they will be automatically valued and included in an organisation (Avery, Volpone, Stewart, Luksyte, Hernandez, McKay, 2013, Koçak, Rومان, Duyck, & Derous, 2022). These perceptions, in turn are likely to influence job and career decisions, particularly in fields and positions where women are underrepresented. For instance, women in male-dominated sectors such as Artificial Intelligence (AI) may expect to be excluded or encounter unfair treatment (Young Wajcman,

& Sprejer, 2021). Previous research has pointed to the “leaky pipeline” to explain the underrepresentation of women in science and technology sectors (Blickenstaff, 2005; Herman, Lewis, & Humbert, 2013; Ibáñez & García-Mingo, 2021), and the job search phase is one of the stages where women may not continue into a career in technological domains. They may anticipate what we call a “chilly climate”, in which they feel unwelcome. This “chilliness” arises from explicit and implicit messages that convey to women that their gender could be a liability in the AI sector. Stereotypical masculine models of performance and competence are known to emerge in the descriptions of job roles in personnel selection in male-dominated sectors (Dick & Nadin, 2006; Hentschel *et al.*, 2021). This is problematic not only from a social justice point of view, but also because the products and tools the AI sector create influence our lives in multiple ways, including education, healthcare, the labour market and the criminal justice system (West, Whittaker, & Crawford, 2019). These tools and products are not neutral but have been found to echo the gender and racial dynamics of the industry leading to bias and discrimination (Ahn, Kim, & Sung, 2022). Consequently, the lack of diversity in the sector reinforces inequality and exclusion not only in the AI industry, but in society more broadly.

The present study develops and validates a measure on anticipated chilly climate for women. First, we show that exclusive climates are distinct from inclusive climates (Nishii, 2013) and contribute to individual-level psychological climate (James, Hater, Gent, & Bruni, 1978) by expanding and reconceptualising a specific, focused (Schneider, Ehrhart, & Macey, 2013) type of climate: that of a chilly climate (Maranto & Griffin, 2011) underpinned by notions of exclusion, devaluation and a gender-imbalanced environment. Further, we contribute to the literature on stigma identity threat theory as a chilly climate is about anticipated threat in a given setting. More specifically, we build on Kroeper, Williams and Murphy’s (2022) important work by requesting individuals to identify freely which factors they believe underpin their perception of an anticipated chilly climate based on real ads. The factors belongingness, exclusion and

devaluation organically emerged from our data which confirms Kroeper *et al* (2022) who examined anticipated belonging, exclusion and devaluation concerns for women in the context of work. Similarly, Purdie-Vaughns *et al* (2008) have a trust and comfort scale in which they measure participants' trust and comfort towards an organization. Their items are adapted from a scale on trust and satisfaction in the workplace. However, even though these items are potentially relevant to understanding the perception of organizational cues amongst stigmatized groups, the issues of trust and satisfaction did not emerge from the focus groups and were consequently not included in our scale.

Study context

The scale development took place in the AI sector. There is an alarming lack of diversity in the AI sector in terms of gender (and other diversity dimensions such as ethnicity) (West *et al.*, 2019). The sector is a male-dominated field and is depicted as a masculine work environment (Miller & Wai, 2015). This context was relevant to our aim to develop a scale on anticipated chilly psychological climate perceptions for women. For instance, women comprise only 15% of AI research staff at Facebook and 10% at Google (Simonite, 2018). Further, almost half of the women who start working in technology eventually leave the sector, which is more than double the percentage of men (Ashcraft, McLain, & Eger, 2016). Most studies exploring the lack of women in AI tend to focus on the “pipeline”, referring to the low level or absence of diverse candidates in the hiring pool. These studies tend to argue that the problem lies within women; their lack of confidence or prior experience, rather than being due to systemic barriers related to the culture in organisations (West *et al.*, 2019). Consequently, organisations in the AI sectors use the pipeline argument to justify the absence of women and other minorities in the workforce and place responsibility on those who are underrepresented (Noble, 2018). However, academic research shows a different picture and points to a culture of exclusion, the domination

of men in the sector and experiences of harassment, unfair treatment and discrimination (West *et al.*, 2019; Young *et al.*, 2021).

Perceived chilly climate for women: a review

We define anticipated chilly climate for women as an individual's expectation of an unwelcoming organisational climate characterised by exclusion, devaluation and an unequal gender distribution. This conceptual definition draws from previous research that posits that a chilly climate consists of exclusion, devaluation and marginalisation (Maranto & Griffin, 2011). Table 1 outlines the similarities and differences with related constructs like organisational climate, psychological climate, diversity climate and a masculine organisational climate.

INSERT TABLE 1 HERE

Previous research on chilly climates suggests that the underrepresentation of women in male-dominated sectors amplifies social marginalisation, leading to a perceived chilly climate (Walton, Logel, Peach, Spencer, & Zanna, 2015). Relational demography theory posits that demographic differences between individuals and their work group impact their workplace interactions, experience of work environment, and a variety of work outcomes (Kirchmeyer, 1995). More specifically, the similarity-attraction paradigm (Byrne, 1971) suggests that demographic similarity increases social integration, cohesion, and attachment to the group (Riordan & Shore, 1997). Thus, dissimilarity in the form of a male-dominated work environment could lead to feelings of exclusion (Maranto & Griffin, 2011). Indeed, earlier studies show that women in male-dominated sectors report feelings of isolation and intimidation, do not feel welcomed and sometimes perceive the atmosphere to be hostile (Blickenstaff, 2005). We draw on social identity threat theory (Steele, Spencer & Aronson, 2002) and signalling theory to examine how subtle organizational cues, such as stereotypical

male gendered language in job ads, are perceived by both men and women. Indeed, social identity threat theory posits that the same information or environment can be perceived differently by various stigmatized groups based on their socio-cultural and historical experiences (Kray & Shirako, 2012; Roberson & Kulik, 2007). Language is a powerful vehicle through which stigmatized groups are represented in organizations (Mooney & Evans, 2018). Previous research has argued that social identity threat is a relevant notion in our understanding of why women may feel devalued or mistreated because of their social identity as a woman and how this influences feelings of vulnerability (Murphy *et al.*, 2007), performance (Canning, Ozier, Williams, AlRasheed, & Murphy, 2022) as well as the recruitment process (Zhu, Dalal, Nolan, & Barnes-Farrell, 2021). More specifically, the lack of women in AI has been associated with perceptions of unfair treatment and an exclusionary culture (West *et al.*, 2019; Young *et al.*, 2021). Organizational cues are often unconsciously applied by managers and signal to stigmatised groups whether their identity is devalued or respected, shaping as such the psychological processes of minorities when they encounter hostile or threatening cues (Emerson & Murphy, 2014). Recent work (Kroeper *et al.*, 2022) confirms that organisational cues on diversity and their lack of authenticity increase women's identity threat concerns, but also reduce interest in the company for both genders. Indeed, given that certain groups in society have previously encountered negative experiences and stereotypes, they may be particularly sensitive to organizational cues about belongingness (Murphy & Steele, 2010) or fair treatment (Purdie-Vaughns *et al.*, 2008). Social identity threat theory thus points to the underlying psychological processes of anticipated climate perceptions among women in STEM.

In sum, previous studies point to the importance of the underrepresentation of women, feelings of exclusion, social marginalisation and devaluation on the perception of a chilly climate. Further, the scale aims to measure *anticipated* chilly climate. In line with signaling theory, job ads provide cues or signals that allow individuals to form expectations about the

climate of an organisation. These expectations guide individuals' subsequent attitudes and behaviors. Potential applicants are presented with a range of cues during the recruitment process. For instance, Wynn and Correll (2018) showed that a lack of women in the recruitment panel, the presentation of technical material as a male domain or gendered perks such as beer fridges and foosball tables as forms of entertainment, all signaled a hostile environment for women. Thus, a scale measuring what kind of climate women expect or anticipate finding will help organisations attract a more diverse talent pool and make the recruitment process more inclusive.

In the following sections we establish the theoretical relationships between the anticipate chilly climate concept and several factors influencing job seekers' attitudes and behavioural intentions. Our focus was driven by the need to explore the relationship between the anticipated chilly climate concept and already established measures in order to ascertain its convergent and discriminant validity (Hinkin & Tracey 1999).

Anticipated chilly climate for women and subjective person-organisation-fit

Person-organisation (P-O) fit refers to the “compatibility between people and organisations that occurs when at least one entity provides what the other needs or they share similar fundamental characteristics, or both” (Kristof, 1996, p. 4-5). Amongst other factors, the perceived fit between one's values and the values of the organisation, determine whether potential applicants will apply. Value congruence is thus the “defining operationalisation of P-O fit” (Kristof-Brown, Zimmerman, & Johnson, p. 285). As values are the building blocks of organisational climate (Grojean, Resick, Dickson, & Smith, 2004), individuals assess the (anticipated) climate of an organisation when reflecting on where they want to work (Ostroff, Shin, & Kinicki, 2005). Building on the Attraction-Selection-Attrition model (Schneider, 1987), individuals who are looking for work draw on their perception of the values of the

organisations and tend to seek employment in organisations that have characteristics and values similar to their own (Baum, Schäfer, & Kabst, 2016; Verwaeren *et al.*, 2017). Further, research has shown that individuals use job ads and the image they have of an organisation to determine their fit with a particular prospective employer (Überschaer, Baum, Bietz, & Kabst, 2016). Potential applicants look for cues that allow them to assess the climate in an organisation (Catanzaro, Moore, & Marshall, 2010; Muruganatham *et al.*, 2020). Especially minority applicants, such as the LGBTQ population, disabled individuals, ethnic minorities or women tend to screen job ads to evaluate the climate in the organisation (Leslie, 2019). Given that exclusion, devaluation and marginalisation are characteristics of a chilly climate, we posit that such a climate will be perceived as a mismatch with person-organisation fit of job applicants.

Hypothesis 1: Anticipated chilly climate is negatively related to subjective person-organisation fit perceptions.

Anticipated chilly climate and organisational attractiveness

Research consistently shows that climate perceptions influence the perceived attractiveness of an organisation in that collaborative (Slåtten & Lien, 2022), ethical (Pagliaro, Lo Presti, Barattucci, Giannella, & Barreto, 2018) and diversity-friendly climates (Rabl & Triana, 2014) tend to be positively related to organisational attractiveness. More specifically, perceptions of safety, support, inclusion, belonging and fit are all positively associated with organisational attractiveness (Corrington, Fa-Kaji, Hebl, King, Stewart, & Alao, 2022; Yu, 2014). In the same line of reasoning, when individuals perceive the climate in their organisation to be exclusionary or discriminatory, perceptions of organisational attractiveness tend to be negatively affected (Martins & Parsons, 2007; Dover, Kaiser, & Major, 2020). In line with previous research, we posit that an anticipated chilly climate holds a negative relationship with organisational attractiveness.

Hypothesis 2: Anticipated chilly climate is negatively related to organisational attractiveness perceptions.

Gendered language in job ads and anticipated chilly climate

Implicit or explicit gender norms and stereotypes are often reflected in job ads. Typically, communal characteristics – pertaining to relationships and social functioning - are often associated with women while agentic characteristics – related to goal achievement and task functioning - tend to be associated with men (Arceo-Gomez, Campos-Vazquez, Badillo & Lopez-Araiza, 2022; Rucker, Galinsky, & Magee, 2018). Thus, through gendered language, job ads provide clues about whether men or women seem most suitable for a given position. Both men and women make inferences about the culture and the climate of an organisation through job ads, with both genders expressing most interest in working in an organisation with a supportive “feminine” culture (Catanzaro *et al.*, 2010). Research has shown that job ads in sectors in which the gender distribution is unbalanced tend to have more gendered language (O’Brien *et al.*, 2022). This is reflected in findings that gendered language in job ads translates into gender segregation (Tokarz & Mesfin, 2021), with women ending up in jobs that tend to have lower pay, sustaining and reinforcing the gender pay gap (Arceo-Gomez *et al.*, 2022). Similarly, gendered wording in ads for college engineering internships were perceived to signal gendered and racial power structures and a performative commitment to equity (Wofford & Smith, 2022). Finally, women are less likely to apply for jobs when gendered language is used because they expect lower levels of belonging (Hentschel *et al.*, 2021). In sum, gendered language in job ads send signals to potential applicants about the climate in the organisation. In line with prior literature, women in male-dominated sectors make inferences about gendered job ads and perceive the climate to be unwelcoming and hostile to women.

Hypothesis 3: Male gendered language in job posts is positively related to anticipated chilly climate.

Material and methods

Our scale development process drew on three studies. Study 1 consisted of an item generation process drawing on previous literature and insights from focus groups. This was followed by Study 2 that involved data collection to refine the items including an examination of the factor structure. Finally, in Study 3, we use the new scale to assess its discriminant and convergent validity (Hinkin & Tracey 1999). More specifically, we explored the relationships among anticipated chilly climate for women, organisational attractiveness, subjective P-O fit and gendered language. Ethical approval from the institution of the first two authors has been sought and obtained prior to the study.

Study 1: Item generation

We used a mixture of deductive and inductive approaches to generate items (Clark & Watson 2016). We drew on previous literature on the perception of a chilly climate for women and other related constructs as well as three focus group discussions with business students in the last year of their studies. All students had some work experience. Individuals with some work experience who are going to enter the labour market are prospective job applicants and were therefore considered a suitable population to study their perceptions of climate based on their reading of job advertisements (Lievens, Decaestecker, Coetsier, & Geirnaert, 2001). The objective of the focus groups was to exchange ideas and perspectives of what a “chilly climate for women” consists of and to identify key themes. Each focus group included five female students who volunteered to participate. The focus groups were held in-person in the academic institution of the first two authors and lasted for about an hour. The aim of the study, “to study anticipated

workplace climates for women in male-dominated sectors” was explained and the moderator ensured that each participant had the opportunity to express herself. The moderator presented a working definition of chilly climate as a starting point for the discussion.

Since the objective was to develop a scale of chilly climate anticipated from the content of job ads our target group (prospective female job seekers) had to be exposed to job posts to generate expectations about an organisation’s climate. The job post extracts were taken from real job ads available on LinkedIn to enhance validity. All participants were given the same set of 15 job extracts for leadership and managerial positions that explicitly mentioned “Artificial Intelligence”. These job ads contained gendered language of the type cited in previous research (Askehave & Zethsen, 2014; Gaucher *et al.*, 2011). The group discussion was facilitated by a word association exercise in which participants were asked to come up with keywords describing each job advertisement. This enhanced spontaneous expressions and has been argued to reduce social desirability biases (Lindzey 1959; Denzin & Lincoln 2011, Carter, Daniels, & Zickar, 2013). Then, the participants were asked to sort the job ads in open categories they could determine themselves, explain their choices and share what kind of climate they would expect to find based on the job ads. The focus group discussions were recorded and transcribed for further qualitative content analysis.

Our focus groups analysis examined what could be anticipated as organisational climate after reading a job post. Several themes emerged from the content analysis of the focus group transcripts. Namely, exclusion, devaluation, feeling unsafe and unequal gender distribution. Sub-themes and representative quotes for each theme are provided in Table 2. The themes exclusion, devaluation and unequal gender distribution align and extend previous research (Maranto & Griffin, 2011). For example, our study revealed that descriptions of job posts can signal lack of equal opportunities to express unsolicited opinions and to be listened to, while Maranto and Griffin’s scale captured experiences of equal solicitation of opinions (e. g., “I feel

that my input and opinions are solicited and valued”). For example, job ad content like “*you’re a true hunter and player coach*” and “*strong communication and leadership skills*” attracted participants to observe that “*it looks like it will be hard to talk to people*”, “*if you don’t use the right words you will be judged*” or “*women don’t have the same opportunities as men to explain themselves*”. These comments inspired our scale statements such as “*My opinion would be ignored*” and “*I would feel intimidated*”.

INSERT TABLE 2 HERE

Based on this focus group analysis and our analysis of the relevant literature, we generated 11 items representing the four themes previously mentioned as indicative of a chilly climate for women, we also used 6 positively worded items based on Maranto and Griffin’s (2011) scale. The adequacy of the item content was assured by drawing on the recurring statements made by the by focus group participants. We adopted this approach as we only wanted to include statements about the chilly climate, which could be expected or inferred by prospective job seekers. The items are presented in Table 3.

Study 2: Item refinement

For Study 2 we relied on samples of final year business students in a European business school who received course credit for voluntary participation and a debrief about the project. The sample was deemed adequate for the study as our respondents all had some previous work experience and were active job seekers with potential interest in leadership positions compatible with their management education.

To generate perceptions of various anticipated climates through job ads, we created two job post vignettes for an AI business development manager including feminine gendered phrases versus masculine-themed phrases identified in previous research such as “empathy is

required” versus “robustness is required”, “supporting your project team” versus “keeping your project team on track” (Askehave & Zethsen, 2014; Gaucher *et al.*, 2011; Rucker *et al.*, 2018) (See Appendix A). These job post vignettes were inspired by real job ads. Job ad pre-tests using a sample of 203 masters level students (75 male and 126 female, average age = 23.02 years, $SD = 2.13$) showed significant differences in perceptions of gendered language with perceptions of “masculine” words such as *rational* ($M_{male-ad} = 4.02, SD = 0.81, M_{fem-ad} = 3.68, SD = 0.89, p = .002$), *aggressive* ($M_{male-ad} = 1.90, SD = 1.24, M_{fem-ad} = 1.47, SD = 0.83, p < .001$), *masculine* ($M_{male-ad} = 2.65, SD = 0.08, M_{fem-ad} = 2.29, SD = 1.22, p = .035$) scoring significantly higher for participants receiving the male-worded ad ($N = 98$) than those in the female ad ($N = 105$). Similarly, “feminine” words such as *a good people person* ($M_{male-ad} = 3.97, SD = 1.16, M_{fem-ad} = 4.27, SD = 0.93, p = .023$), *open to others* ($M_{male-ad} = 4.07, SD = 0.99, M_{fem-ad} = 4.42, SD = 0.89, p = .004$) and *emotional* ($M_{male-ad} = 2.34, SD = 1.06, M_{fem-ad} = 3.02, SD = 0.89, p < .001$) scored significantly higher for the female-worded job ad.

Procedure

To refine the scale, a sample of 136 female masters’ students (average age = 20.6 years $SD = 0.89$) were randomly assigned to one of the job ads (see Table 3).

In contrast to our expectations based on Maranto and Griffin’s (2011) conceptualisation of chilly climate, the results of the exploratory factor analysis (EFA) show that 52% of the variance was explained by two main components. The first component included exclusively negatively worded items such as “*I might feel isolated or left out*” indicative of a chilly climate and the second included exclusively positively worded items such as “*I would be encouraged to give my opinion*” representing a “warm climate”, similar to the inclusive climate construct proposed by Nishii (2013). Certain indicators varied in their loading across split sub-samples, indicating instability. These included assessments of organisations as “feminine” and whether there would be the necessary “social support”. Further, one item “*I would be afraid of failing*” loaded onto

a separate dimension. We can conclude that perceptions of a “chilly climate” are conceptually different from perceptions of an “inclusive climate”.

To test that the anticipated chilly and inclusion constructs were indeed distinct, we used confirmatory factor analysis (CFA) using STATA/SE 13.1, modelling chilly climate ($\alpha = 0.86$) and inclusion climate ($\alpha = 0.85$) as latent factors freely allowed to correlate, with six and five items respectively as indicators. Results show good fit to the data [$\chi^2(43) = 65.57, p = .015, CFI = 0.96, RMSEA = 0.07, SRMR = 0.06$]. The correlation coefficient between the two latent factors was $r = -.49, p < .001$, indicating convergent validity between the constructs (Cheung & Wang, 2017). A collapsed single factor model fit the data less well [$\chi^2(44) = 193.53, p < .001, CFI = 0.70, RMSEA = 0.18, SRMR = 0.12$] [$\Delta \chi^2(1) = 127.96, p < .001$]. These results suggest that anticipated chilly and anticipated inclusive climates are related, but distinct constructs.

INSERT TABLE 3 HERE

Study 3: Scale validation and hypotheses testing

Sample and Procedure

To test Hypotheses 1, 2 and 3, we ran an online experiment with 302 UK participants using respondents from a European panel provider. Seventy-eight responses were incomplete or failed the attention check and were eliminated, leaving a final sample of 224 participants. Of the total sample, 125 (56%) were female, the average age was 45 years old ($SD = 12.09$), and the average work experience was 20.42 years ($SD = 11.83$). Sixty participants (26.8%) were actively looking for new job opportunities, 87 (38.8%) were considering it, and 77 (34.4%) were not considering new job opportunities.

We informed participants that their answers would be used for research purposes only and asked them for consent before proceeding. After ensuring that all participants were of age, we randomly presented one of the job ads (see Appendix A) with either masculine or feminine-themed wording. Afterwards, they responded to the items measuring perceptions of anticipated chilly climate, organisational attractiveness, subjective person-organisation fit and demographic questions.

Measures

The following scales were used to measure the constructs.

For anticipated chilly climate we used the six-item scale developed in Study 1 ($\alpha = .80$).

For organisational attractiveness the five-item scale from Highhouse *et al.* (2003) was used ($\alpha = .92$). We measured subjective person-organisation values fit using the sub-scale from Cable and DeRue (2002) anchored by “strongly disagree” (1) to “strongly agree” (7). An example for the three-item values fit is “My personal values match this organisation's values and culture” ($\alpha = .95$). Regarding gendered language in the job ads, masculine worded ads were coded as 2 and feminine worded ads as 1. We controlled for age, gender, work experience and the degree to which the respondents were seeking a job (1 = not at all; 2 = considering it; 3 = actively searching) in all analyses and also for job ad language for hypotheses 1 and 2. These control variables echo earlier studies (Pascarella *et al.*, 1997). Previous research suggests that work experience can influence chilly climate perceptions as women who perceive a climate as chilly may withdraw and decide to work in a different sector (Britton, 2017). Similarly, more experienced individuals, unemployed or older women may become less sensitive to cues that signal chilly climates (Morris & Daniel, 2008).

Confirmatory Factor Analysis

As in study 2 convergent validity between chilly and inclusive climates was confirmed. [$\chi^2(43) = 145.66, p < .001, CFI = 0.89, RMSEA = 0.10, SRMR = 0.08$]. The correlation coefficient between the two latent factors was $r = -.33, p < .001$. A collapsed single factor model fit the data less well [$\chi^2(44) = 417.83, p < .001, CFI = 0.61, RMSEA = 0.20, SRMR = 0.14$] [$\Delta \chi^2(1) = 272.17, p < .001$].

To test for discriminant validity, the Fornell-Larcker procedure was performed for anticipated chilly climate and organisational attractiveness constructs (Cheung & Wang, 2017). Average variance extracted of both constructs was 0.54, above $r^2 = .096$, with a low correlation coefficient $r = -0.31$ indicating that anticipated chilly climate is a distinct construct from organisational attractiveness.

Results

Means, standard deviations and correlations are presented in Table 4.

INSERT TABLE 4 HERE

To test hypotheses 1 and 2 we carried out linear regression analysis entering the control variables, the anticipated chilly climate as independent variable and fit perceptions and organisational attractiveness as dependent variables. Both hypotheses 1 and 2 were confirmed. Results are depicted in Table 5.

INSERT TABLE 5 HERE

To test hypothesis 3 we performed ANOVA, entering the job ad as independent variable and anticipated chilly climate as dependent variable, with gender, job seeking and age as control variables. The feminine/masculine gendered worded ads had a significant effect ($F(4,219) = 80.26, p < .001, \eta^2 = .27$), on the anticipated chilly climate perceptions, in support of hypothesis 3. This was significantly higher for the masculine-worded ad ($M_{chilly-male} = 3.99, SD = 0.97$) than

the feminine-worded ad $M_{chilly-fem} = 2.97$, $SD = 0.70$, $p < .001$) (see Table 6). To examine whether the masculine/feminine language of the ad influenced differently the perceptions of anticipated chilly climate by gender, we performed the analysis using both gender and job ad as independent variables, testing for interactive effects. The masculine/feminine language manipulations of the job ad resulted in similar effects on anticipated chilly climate for both genders ($F(5,218) = 0.01$, $p = .928$, $\gamma^2 = .00$).

INSERT TABLE 6 HERE

This final result indicates that both men and women perceive masculine-worded ads as indicative of an anticipated chilly climate.

From our pre-tests of the job posts we also established that masculine language creates expectations that the ideal candidate will be a man or exhibit stereotypically masculine traits (reported in study 2). Hence, we suggest that male candidates may anticipate the climate of an organisation to be chilly, potentially because their demographically dominant group could be implicitly favoured creating a climate of gender-based group exclusion.

Discussion

Organisations in the AI sector tend to justify the lack of diversity in their workforce by stressing there are few suitable candidates (West *et al.*, 2019). Academic research, however, points to the role of a hostile organisational climate for attracting and retaining diverse populations (Young *et al.*, 2021). More specifically, minority applicants have reported on a lack of feeling of belonging to the field (Rainey *et al.*, 2018), gender stereotypes (Block *et al.*, 2019), poor work-life balance (Fouad *et al.*, 2017) and a masculine culture (Miller & Wai, 2015) as reasons to leave or stay away from the sector. We show that language that signals a lack of diversity and inclusion in an organization is associated with anticipated chilly climate, which relates to previous research that found that beliefs about an organization are influenced more strongly by

diversity cues that people observe than what an organization says (Wilton, Bell, Vahradyan, & Kaiser, 2020). We shed light on the role job ads play in the recruitment process to communicate about the strengths and attractiveness of the organisation (Petry, Treisch, & Peters, 2021). More specifically, we show that masculine gendered language influences one's perception of a chilly climate, that in turn affects perceptions of fit between one's own values and those of the organisation (Böhm *et al.*, 2020) and the organisation's attractiveness to prospective employees (Hentschel *et al.*, 2021). In line with earlier research, masculine-themed words in job ads tend to discourage women from applying (Askehave & Zethsen, 2014; Gaucher *et al.*, 2011) which can result in a loss of talent and the reproduction of the gender imbalance in the AI sector. However, we find the same effect for men. This is important not only from a social justice angle, but also because of the benefits a diverse workforce can bring to organisations (Zhang, 2020). Our anticipated chilly climate construct captures perceptions of an anticipated exclusionary environment, feelings of devaluation, intimidation and a masculine environment. These aspects thus underpin the perception of an anticipated chilly climate in a given organization which is similar to Kroeper and colleagues (2022). Our results show that anticipated chilly climate is an important concept with implications for applicants' career decisions and career growth, which is a particularly challenging issue in industries where gender ratios are imbalanced, leading to perceptions of a "masculine" culture.

By developing the anticipated chilly climate construct, we contribute to the discussion surrounding focused climates (Schneider *et al.*, 2013). Previous research has provided conceptual and measurement frameworks for focused climates such as inclusion and gender-inclusive climates (Dwertmann, Nishii, & Van Knippenberg, 2016; Nishii, 2013), ethical climate (Hsieh & Wang, 2016) or competitive psychological climate (Spurk, Hofer, & Kauffeld, 2021). Our research draws and builds on this body of work in several ways. First, in line with stigma identity threat theory, we focus on an anticipated climate rather than a climate based on

actual experience within the organization. This is important when job seekers are in the process of assessing their potential fit with a new employer. Second, through empirical testing, we show that anticipated chilly climate is a related, but distinct construct from inclusive climate (Nishii, 2013) and not simply a negative or reverse side of this established concept. Third, we provide a measurement instrument for anticipated chilly climate which can be used by scholars for future research in different industries. The focus of our study was in the AI sector because of the current challenges of increasing workforce diversity in a male-dominated industry. However, the measure itself is applicable to any sector, and differs from Maranto and Griffin's (2011) scale which focused on chilly climate experienced by women in an academic environment and used inclusion concepts within the original measure. Further, it confirms the factors devaluation, marginalization and exclusion of anticipated threat in a given context as used by Kroeper and colleagues (2022) and call this anticipated chilly climate. By developing this construct, organisations are more likely to be able to deal with the issues related to chilly climates. For example, to mitigate feelings of devaluation associated with chilly climates it is important that individuals feel they can freely express themselves and that their ideas and opinions are being taken seriously. Research has shown that being ignored is associated with emotional exhaustion both in one's professional and personal sphere (Thompson *et al.*, 2020). Moreover, being ignored is a powerful tool for the dominant group to suppress experiences of inequality and discrimination and a way to undermine one's sense of self and the validity of one's experiences and skills (Wu, 2021). Understanding chilly climates will also help address the problem of exclusive environments where there is a lack of social support and in which individuals feel isolated. Perceived isolation has been associated with feelings of helplessness (Wong *et al.*, 2019) and a lack of perceived social support has been linked to lower mental health (Wang *et al.*, 2018).

Finally, while we hypothesized that masculine gendered language would be associated with perception of an anticipated chilly climate for women, we found that masculine gendered language in job ads was also related to the perceptions of chilly climate for men. Past evidence on this topic shows no difference between job appeal and masculine versus feminine language for male applicants (Gaucher *et al.*, 2011; Oldford & Fiset, 2021). However, our study suggests that both men and women, both young job seekers and older, established employees prefer job ads with feminine-themed words. One possible explanation could be attributed to claims that agentic masculine language, i.e. focused on achievement, rationality and pursuing self-interest is also associated with the dominance of higher-power and higher-class individuals (Rucker *et al.*, 2018). Thus, job posts with such language may signal support for dominant, power-driven social hierarchies, thus contributing to the expectations of exclusionary environment, devaluation and intimidation (chilly climate) for anyone who may not share these perspectives.

Our finding that masculine gendered language was unattractive to men was unexpected in the light of past studies that did not find negative effects of masculine language in job posts on male candidates (Gaucher *et al.*, 2011; Oldford & Fiset, 2021). However, it provides evidence consistent for the argument that gender-diverse environments are enjoyed by everyone. Therefore, actions which implicitly or explicitly question organisational commitment to support demographically underrepresented and historically marginalised groups have negative broad-reaching effects (Zhang, 2020).

Practical implications

Women and gender-diverse groups are underrepresented in executive or leadership positions (Nater & Sczesny, 2016). Job ads for higher-ranked positions often implicitly emphasize masculine traits, which not only might create an image of women as less legitimate top managers than men (Askehave & Zethsen, 2014) but also may deter men from wishing to

join such organisations. These ads may consequently deprive organisations of benefiting from both female and male talent in higher positions (Askehave & Zethsen, 2014; Dutz *et al.*, 2022). Nevertheless, evidence shows that using gender-neutral language in ads is easy and not costly (Horvath & Sczesny, 2016). The anticipated chilly climate scale can help identify if such interventions are actually effective on prospective female job applicants. It also can assist in further research on the antecedents of chilly climate perceptions, which may be subject to gender biases in other forms of employer communication or stemming from candidates' experiences with the selection process. Currently, the closest proxy to capture such effects is via scales of organisational attractiveness, which do not specifically recognise the possible underlying sources of low attractiveness such as candidates' expectations of devaluation, marginalisation and exclusion at the prospective employment embedded in the perceptions of anticipated chilly climate for women. Since we found that both genders anticipate higher levels of chilly climates when job ads contained masculine words, with effects on organisational fit perceptions and attractiveness, firms might benefit from creating job ads with more communal feminine language emphasizing that cooperation and building social relations are valued by the organisation. However, individuals make inferences about the climate at a potential prospective organisation not only through job ads, but also through other cues such as the organisation's website. Thus, organisations should be mindful of masculine gendered language on their websites and in the way employees who represent the organisation during job fairs or in the media speak about the organisation. Other forms of communication, such as brochures, promotional videos and blogs could equally be screened on gendered language.

Limitations and directions for future research

Several limitations of the study are acknowledged as we present some avenues for future research.

First, in this study participants were presented with fictive job advertisements that were based on real ads. However, individuals are likely to not only draw on the job ad itself, but also look at an organisation's website to evaluate statements about its values, policies and awards as they make inferences about the attributes of the organisation (Braddy, Meade, & Kroustalis, 2006). Future research could aim to disentangle the influences of job ads and other ways in which individuals try to get an idea of what an organisation's climate is like, such as by reading about the organisation on [glassdoor.com](https://www.glassdoor.com).

In addition, we tested the relationship between anticipated chilly climate for women on the one hand and person-organisation fit and organisational attractiveness on the other hand. While these two variables were logical choices to test our scale, future research could adopt a wider range of outcome variables such as perceptions of work-life balance, job satisfaction, desire for career advancement, intention to apply or whether one would recommend the organisation to others. Further research could also establish whether anticipated chilly climate aligns with or differs from actual perceptions of chilly climate. Studies in this direction could explore the reasons leading to greater alignment or divergence between anticipated and experienced chilly organizational climates. The present anticipated chilly climate measure could be further adapted to capture the anticipated devaluation, marginalization and perceptions of unequal relational demography in organizations as seen by job-seekers from diverse minority groups. This is important as other attributes of minority-groups may be conveyed in the language used in job ads (Koçak *et al.*, 2022) and influence the perceptions of anticipated chilly climate for these groups.

Finally, while this scale measures chilly climate for women, future research could examine how other minority groups like disabled individuals, older workers, ethnic minorities or individuals who self-identify as LGBTQ react to the exclusively masculine or feminine or mixed gendered language in job ads and whether it influences their perceptions of anticipated chilly climate. Does feminine language lead to perceptions of inclusion for all or is it only related to gender? Does mixed gendered language in job posts signal inclusion for all? Some argue that communal (feminine) language is a powerful signal of tolerance and inclusiveness to groups who may see themselves to be in a disadvantaged position in professional or other contexts (Rucker *et al.*, 2018). Future research could also account for the intersectionality of gender and other social identities such as having a migration background in male-dominated sectors (Bolzani, Crivellaro, & Grimaldi, 2021). Similarly, cultural differences in terms of gender norms exist. The sample consisted mainly of western countries, while for example in Malaysia computer science is perceived to be a suitable career path for women because it involves office work and keeps them indoors (Lagesen, 2008). Future research can enhance our cross-cultural understanding of what constitutes a chilly climate.

Conclusion

Drawing on three different studies, this article develops a measure of anticipated chilly climate and provides initial evidence of its validity. We show that anticipated chilly climate is an important concept with implications for applicants' career decision making in the technology industry. Further, we show that both men and women make inferences about the climate of a prospective employer through gendered language in job ads and have a preference for feminine communal language.

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Table 1: Comparison of related climate concepts with anticipated chilly climate construct

Concept	Definition	Similarities and differences with anticipated chilly climate
General conceptualizations of organizational climates		
Organizational climate	The meanings people attach to interrelated bundles of experiences they have at work (Schneider <i>et al.</i> , 2013).	Organizational climate focuses on shared and aggregated level of perceptions, while anticipated chilly climate focuses on the level of the individual.
Psychological climate	A set of perceptions that reflect how work environments, including organizational attributes, are cognitively appraised and represented in terms of their meaning to and significance for individuals' (James <i>et al.</i> , 1978, p. 129).	Both constructs are on the individual level (James <i>et al.</i> , 1978). However, anticipated chilly climate focuses on the climate individuals anticipate, not the actual perceptions. It also delineates a specific type of climate in a "focused" construct.
Focused conceptualizations of organizational climates		
Diversity climate	Employees' shared perceptions firm's use of fair policies and social integration of underrepresented employees (McKay <i>et al.</i> , 2009) Organization's efforts to ensure equal work opportunities and the absence of discrimination, plus efforts to create synergy from diversity (Dwertman <i>et al.</i> , 2016)	Anticipated chilly climate focuses on the level of the individual, whereas diversity climate is an aggregate level of experienced (not anticipated) climate. Similarities lie in the notion of "inclusion" vs "exclusion"
Masculine organizational culture/competitive psychological climate	"Competitive" culture (Catanzaro <i>et al.</i> , 2010), respect for authority, competition, individualism, independence, and task-orientation. Competitive psychological climate: Emphasizes employee perceptions where rewards depend on comparisons of one's own performance with that of colleagues (Spurk <i>et al.</i> , 2021)	Anticipated chilly climate is broader than only a masculine/competitive climate, including notions of exclusion and devaluation.
Chilly Climate	Informal exclusion, devaluation, and marginalization. (Maranto & Griffin, 2011) for women in academic institutions.	Measures both exclusion and inclusion (reverse coded), tailored to chilly climate perceptions in an academic environment. Anticipated chilly climate differentiates inclusion from exclusion (concepts and measures) and adapts to a job-seeker context.

Table 2: Anticipated chilly climate: Themes, sub-themes and illustrative quotes based on focus groups.

Theme	Sub-theme	Illustrative quote
Exclusion	Exclusionary network	You see that the bosses have a preference for men because they think that they get along better between them.
	Lack of social support	I'd expect lots of stress and competition between the employees.
	Feeling unwelcome	These jobs don't necessarily target men, but as women, we read them and feel excluded, like we are not invited.

	Lack of sense of belonging	Right now the situation or the market demands men, you see that from top to bottom. If they only say like “do your job”, well I don’t feel like we’re going to be that integrated. Technology is more related to men rather than women. So women are immediately discouraged to choose these positions; and at some point they automatically program themselves that they are not good.
Devaluation	Not being heard/listened to	Women don’t have the same opportunities as men to explain themselves.
Feeling unsafe	Fearful	I would be scared to work with only men. You would expect maybe more aggressive environments.
Unequal gender distribution	Lack of women	You need representation to feel you can succeed. That’s why when you have an excellent business woman, you feel okay I can do it too. You don’t really see a lot of women scientists, and that just gives you, when you are a kid, that gives you an idea of what you can strive for; and if you don’t really see the representation, then maybe you don’t visualize yourself in that position.

Table 3: Study 2 exploratory factor analysis with varimax loadings for anticipated climate items

	Factor Loading		
	1	2	3
Anticipated chilly climate			
1. <i>There would be an “elite” network difficult to enter</i>	0.69	-0.12	-0.01
2. <i>I would not find the social support I needed</i>	0.49	-0.20	0.37
3. <i>I might feel isolated or “left out”</i>	0.83	-0.23	0.09
4. <i>My opinion would be ignored</i>	0.76	-0.33	0.16
5. <i>There might be discrimination against people like me</i>	0.64	-0.21	0.41
6. <i>I would feel intimidated</i>	0.66	-0.22	0.12
7. <i>There would be a stressful environment</i>	0.81	-0.11	-0.18
8. <i>There would be a very “masculine” culture</i>	0.72	-0.16	-0.01
9. <i>I would be afraid of failing</i>	0.15	-0.01	0.77
10. <i>There would be a very “feminine” culture</i>	0.54	-0.07	-0.52
Inclusive climate			
11. <i>There would be a lot of opportunity for collaboration with colleagues</i>	-0.11	0.82	-0.04
12. <i>I would be encouraged to give my opinion</i>	-0.19	0.77	-0.20
13. <i>I could be myself</i>	-0.32	0.71	0.12
14. <i>They would encourage sharing of information</i>	-0.07	0.76	-0.27
15. <i>My opinions would be taken seriously</i>	-0.34	0.59	0.25
16. <i>My input would be valued</i>	-0.22	0.84	0.09

Two factor model statistics: $\chi^2(43) = 65.57, p = .015, CFI = 0.96, RMSEA = 0.07, SRMR = 0.06$

Single factor model statistics: $\chi^2(44) = 193.53, p < .001, CFI = 0.70, RMSEA = 0.18, SRMR = 0.12$

$$\Delta \chi^2(1) = 127.96, p < .001$$

Note: The items in *italics* are retained for subsequent analysis and the final chilly climate scale.

Table 4: Means, standard deviations and correlations, Study 3 ($N = 224$)

	<i>M</i>	<i>SD</i>	1	2	3	4	5	6
1. Age	44.92	12.09						
2. Job-seeking	2.08	0.78	.34***					
3. Job advertisement	1.50	0.50	-.12	-.06				
4. Gender	0.56	0.50	-.17	.02	.06			
5. Chilly Climate	3.48	1.00	-.16*	.01	.52***	.03		
6. Values-fit	4.37	1.36	-.13	-.15*	.20**	-.02	-.30***	
7. Org. Attractiveness	4.64	1.39	-.08	-.28***	-.21**	-.01	-.31***	.76***

* $p < .05$; ** $p < .01$; *** $p < .001$.

Table 5: Effects of anticipated chilly climate on perceived fit and organisational attractiveness ($N = 224$)

Predictors	<i>Values Fit</i>			<i>Org attractiveness</i>		
	β	<i>t</i>	<i>p</i>	β	<i>T</i>	<i>p</i>
Constant		12.19	.000		14.26	.000
Control variables						
Age	-.01	-0.20	.844	-.04	-.55	.580
Job seeking	-.15	-2.19	.029	-.27	-4.15	.000
Job advert	-.07	-0.90	.371	-.090	-1.23	.218
Gender	-.01	-0.20	.844	.01	.12	.908
Main variable						
Chilly climate	-.26	-3.50	.000	-.27	-3.71	.000
Model Statistics	$R^2 = .11$ $F(5,218) = 9.43, p < .001$			$R^2 = .16$ $F(5,218) = 9.56, p < .001$		

Table 6 :Effects of gender-worded job ads and gender on chilly climate perceptions ($N=224$)

ANOVA: Gendered wording on chilly climate perceptions			
Predictors	<i>F</i> (4,219)	<i>p</i>	γ^2
Intercept	231.33	.000	.514
Control variables			
Age	3.78	.053	.017
Job seeking	1.10	.296	.005
Gender	0.10	.757	.000
Main variable			
Job ad gender wording	80.26	.000	.268

Interactive effects of gendered wording and gender			
Predictors	<i>F</i> (5,218)	<i>p</i>	γ^2
Intercept	251.78	.000	.536
Control variables			
Age	3.73	.055	.017
Job seeking	1.10	.297	.005
Main variables			
Job ad gender wording	78.75	.000	.265
Gender	0.10	.759	.000
Interactive effect			
Job ad x Gender	0.01	.928	.000

Appendix 1: manipulated phrases with masculine/feminine-themed language:

Job Title: AI Business Development Manager

We are a leading AI and advanced analytics business. Our mission is to generate innovative solutions for cities. Founded in 1990, we are headquartered in Silicon Valley, operating in 150 countries with 16,500 employees. Our AI combined with augmented and virtual reality (AR and VR) collects real-time city-wide data to create smart, connected cities.

Qualifications and qualities

M1: A certain *robustness*^a is required so that *calmness is preserved in stressful situations*^b, *controlling*^b and ensuring that the team works *efficiently*^c.

F1: *Empathy*^b is required to encourage a safe and creative environment, *enabling the team to express their feelings*^{b,c} and voice their opinions in stressful situations.

M2: *Powerful*^b communication skills necessary

F2: Communication skills fostering *social relationships*^c

- Experience in management not required, but is an advantage

- Masters degree in Business. Knowledge of AI and the high tech sectors is a plus.

Principal Responsibilities:

M3: *Ensuring efficient*^c communication between AI developers and clients

F3: *Enabling smooth*^b communication between AI developers and clients

M4: *Keeping your project team on track to deliver technical solutions on time*^c.

F4: *Supporting your project team*^a to fulfil their potential to develop creative solutions.

- Managing a team which liaises with AI developers to offer practical solutions to clients

- Maintaining communication and working closely with other departments

We offer a very competitive benefits and pay package, with scope for fast promotion and career development. Full details are found on our website.

Note: M=statement in masculine language ad; F= statement in feminine language ad; *a*: Taken from the list of masculine and feminine words (Gaucher *et al.*, 2011); *b*: Taken from the list of gender-themed words and phrases identified by Askehave & Zethsen (2014); *c*: Taken from the description of agentic and communal traits by Rucker *et al.*, (2018).