

# **“We” versus “You”: Exploring the Extent of Gendered Language in Purchasing and Supply Management Job Advertisements**

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## **Biographical Notes:**

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Nina Hasche is an Associate Professor at Örebro University School of Business in Sweden. Her research interests include change and development processes in business relationships and networks, where recent projects have focused on value creation, trust building and resource development in various types of collaborations. She is also interested in inequalities of work life. Her work has been published in Journal of Business Research, Industrial Marketing Management, Public Management Review and European Journal of Innovation Management among others.

Vojtěch Klézl is a Senior Lecturer at the Örebro University School of Business. He finished his PhD at VSB-Technical University of Ostrava in 2017, examining reverse electronic auctions. His research interests include skills, personal traits and the issues of gender and

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Professor Donna Marshall is a multi-award-winning Sustainable Supply Chain scholar, Executive Director of the UCD Earth Institute: People, Work, Society initiative and former President of the International Purchasing and Supply Education and Research Association (IPSERA). She is ranked among the top supply chain researchers, with over one hundred research outputs including journal articles published in MIT Sloan Management Review, Journal of Business Ethics, Production and Operations Management, International Journal of Operations and Production Management, Journal of Supply Chain Management, Journal of Purchasing and Supply Management and Supply Chain Management International Journal. She has won research funding with multiple national and international teams amounting to over €30 million and is currently leading teams focusing on sustainable supply chains in fashion with Fashion's Responsible Supply Chain Hub (FReSCH); sustainable bio-circular economy; and transparency in complex supply chains including controversial industries.

Dr Klaas Stek combines an assistant professorship in purchasing and supply management with a trailblazer role in establishing the European Lab for Innovative Purchasing and Supply (EL-IPS) at the University of Twente (UT) in the Netherlands. Coordinating a master course Purchasing Management at the University of Twente for Industrial Engineering Management students, he combines a mix of cognitive and non-cognitive learning objectives in his classes; for instance, he formalised creativity and inventiveness and added appropriate didactics and assessment tools.

## **Abstract**

This paper explores the use of gendered language in purchasing and supply management job advertisements across three English-speaking countries. We use secondary data from a global job advertisement website to analyse the extent to which gendered language is used. We explore if agentic, traditional masculine wording, or communal, traditional feminine wording, is used at different hierarchical levels of advertising for purchasing and supply management jobs. Our findings show that there is no significant evidence of a glass-ceiling effect. However, there may be evidence of a sticky-floor effect due to the communal language used in the assistant buyer and buyer job advertisements, which decreases significantly at higher levels. Agentic language use remained constant across the levels. We also found that certain agentic words are more often featured in senior-level advertisements.

## **Keywords**

Job advertisements, female, women, gender issues, gendered language, purchasing and supply management

## **1 Introduction**

Fewer than one in three buyers identify as female, with 75% of category managers identifying as male and only 25% of people on Purchasing and Supply Management (PSM) management committees and management teams identify as female (Sancier-Sultan and Sperling, 2018). The membership of the leading PSM academic association IPSERA shows similar patterns, with approximately one-third of members identifying as female (IPSERA, 2020). The disparity at the most senior level of PSM is striking, as only 12% of Chief Purchasing Officers (CPOs)

in Europe (Sharp, 2017) and only 7% in the United States identify as female, which is relatively low compared to other business disciplines and functional areas (Lawrence et al., 2018).

This lack of female representation is further compounded by gender-based stereotypes, with more than 45% of CPOs stating that rationality is a ‘masculine’ trait; risk-taking or decision-making is a ‘masculine’ strength; while activities requiring interpersonal skills are seen as ‘feminine’ (CIPS, 2019). Gender diversity is not solely a moral issue for contemporary society. It is also of practical, operational, and strategic significance for organisations (Churchman and Thompson, 2008), as greater diversity has been shown to increase both creativity and innovation (Díaz-García et al., 2013), promotes higher quality decision-making (Park and Krishnan, 2005) and contributes to PSM sustainability (Ruel et al., 2020).

While people identifying as female dominate postgraduate PSM education, as 60% of the student of PSM Masters’ programmes in major European countries identify as female (Nouguès et al., 2019), female representation decreases at every level beyond this point. It suggests an issue with career progression for females in the PSM field. There may be several explanations for this. Research in other areas concludes that the language used in job advertisements presents a systemic obstacle to females entering the field and progressing from junior to more senior hierarchical levels.

Previous research (e.g. Born and Taris, 2010; Horvath and Sczesny, 2016) has shown that females feel more excluded, are less inspired to apply for the job and identify less with jobs when masculine language is used in job advertisements rather than gender-fair wording. Job advertisements are often linguistically formulated in ways that create the risk of discrimination, i.e., risks that can exclude certain groups of applicants, particularly concerning their gender. Particularly in male-dominated professions or leadership roles, the specific language of job advertisements is of great importance if more females are to be attracted to apply for jobs at a senior level. The need for research into this issue in the PSM field has been distilled into the following research question:

**RQ** To what extent is gender-biased language used in PSM job advertisements at different hierarchical levels?

To address this research question, we use the widely-cited gender-based agentic and communal language dictionaries first introduced by Gaucher et al. (2011) and further developed by Pietraszkiewicz et al. (2019) to explore the language used in PSM job advertisements. These dictionaries: “represent reliable tools for quantifying the content in natural language” (Pietraszkiewicz et al., 2019). Our analysis is based on a sample of 365 English-language jobs across a range of hierarchical job levels, which were analysed using the LIWC 22 (Linguistic Inquiry and Word Count) software to identify the number and percentage coverage of the language of both dictionaries and one-way ANOVA tests were run to assess whether the mean number of references differs based on hierarchical levels.

We contribute to a recent stream of PSM literature that focuses on enhancing diversity, in particular gender-responsive procurement, which so far has mainly considered the need to improve the procurement opportunities for female-led organisations (e.g. Orser et al., 2021) and gender differences in specific PSM roles and activities, e.g., buyer-supplier relationship management (Croom et al., 2021), negotiation (Moslehpour et al., 2021) but which recognises the need for the PSM profession to take steps within itself to address the gender imbalance. We, therefore, extend the work of Lawrence et al. (2018), which focuses on the causes of the low representation of females in senior executive procurement positions, which was shown to be lower than in other professions and uses Social Dominance Theory (SDT) to offer a complementary perspective on the systemic barriers that may exist.

## 2 Literature Review

### 2.1 Glass-ceiling effect

Barriers to entry, particularly to top-level management positions, are known as the ‘glass-ceiling’ effect (Powell and Butterfield, 2003). This effect has been studied from several perspectives, particularly race (Wijesingha and Robson, 2022). From a gender perspective, the glass-ceiling effect has been researched in government (Čičkarić, 2014), the judiciary (García Goldar, 2020), education (Mert, 2021), accountancy (Broadbent and Kirkham, 2008), call centres (Scholarios and Taylor, 2011), general management (Singh, 2019), committees (Espinosa and Ferreira, 2022) and boards of management (Arfken et al., 2004). This type of research has mainly focused on the lack of females in ‘leadership’ positions. Additionally, some practitioner-based publications highlighted the disparity in gender representation in the PSM field (as shown in the introduction). A small body of academic literature, such as Lawrence et al. (2018) and Ruel and Jaegler (2021), highlights the need for further academic research.

Different theoretical perspectives have been used to explain the glass-ceiling effect. From a risk perspective, Kanter (1977) suggests that organisations minimise risk by restricting entry to people who are ‘different’, resulting in females then occupying minority ‘token’ roles and exclusion from the ‘Old Boys’ Clubs’, which tends to be prevalent in senior ranks (Morrison et al., 1987). This is also associated with the ‘dominance’ perspective (Baxter, 2010), exemplified by Schein’s dictum ‘*think manager, think male*’ (Schein, 1975). This perspective suggests that management traits are strongly associated with stereotypically male attributes, with successful managers being: “authoritative, strong-minded, decisive, aggressive, competitive, confident, single-minded, goal-oriented, courageous, hard-nosed and adversarial” (Holmes, 2008, p.3).

Other person-centred theories have examined gender-based differences in education, experience, skills, abilities, and attitudes contributing to females’ underrepresentation (Morrison and Von Glinow, 1990; Morrison et al., 1987). This suggests that, due to gender differences, females: “are less likely to ask for advancement, are ambivalent about success, and fear taking career risks” (see: Morrison et al., 1987; Tharenou, 1999). This is often associated with gender essentialism (Stone, 2004), the theory that there are innate and different traits in men and females. A person must possess these traits to be a male or female.

‘Differences’ theories (Baxter, 2010) suggest that gender is investigated from a *differences* perspective. These theories were founded by Kotter (1999), who studied different types of leaders with two ideal types: transactional and transformational. The transactional leader typically has male traits such as planning, organisation, goal setting, control, and analysis. In contrast, the transformational leader generally has female characteristics such as creativity, vision, listening, empathising, empowerment, team building, and relationship building (Alimo-Metcalfe, 2010; Eagly and Johnson, 1990; Rosener, 1990). This directly impacts hiring because men dominate the management selection process and will hire based on traits they see as essential for successful management (Alimo-Metcalfe, 2010).

Both the dominance and differences theories caution that the way males and females are viewed within these theories is gender essentialism, the foundation of stereotyping, and perpetuates gender discrimination for males and females (Askehave and Zethsen, 2014; Billing, 2011; England, 2010; Holmes, 2006). The ‘dual’ perspective (Baxter, 2010), in comparison, proposes that traits are neither male nor female, not connected to gender, but are specific to the individual and that males or females can have or learn different traits and that leadership behaviour is

dependent on other factors such as age, experience, company strategy, industry and business type (Askehave and Zethsen, 2014; Billing, 2011; England, 2010; Holmes, 2006).

## 2.2 *Sticky-floor effect*

As well as the glass-ceiling effect that prevents women from entering leadership positions, another effect at the other end of the hierarchical organisational spectrum has been identified: the sticky-floor effect. These are the discriminatory working patterns that keep employees (often females) at the lower end of the employment spectrum (EIGE, 2023) and act as an invisible barrier that prevents women from progressing beyond a certain hierarchical level in their organisations (Ryan and Haslam, 2006). This means a group or individuals face rigorous working conditions or challenges when first joining a particular labour market (Ge et al., 2011). Due to these barriers, females may “remain in the same positions or opt for other alternatives such as part-time employment or even quitting their jobs” (Shabsough et al., 2021). As such, the glass ceiling and sticky-floor effects keep females from entering ‘male-dominated’ jobs and progressing through the organisational hierarchy.

In one study in Spain, not only were women discriminated against at the most senior levels of employment, with wage discrepancies between male and female highest earners, but women from the poorest economic backgrounds had the most significant wage discrimination overall compared to men (Del Río et al., 2011). In India, a wider wage gap appears at the bottom of job hierarchies in urban areas (Agrawal, 2013), with similar phenomena in Bangladesh (Faruk, 2021), Thailand (Fang and Sakellariou, 2015) and China (Chi and Li, 2008) have been identified. However, much of this research tends to adopt a country rather than a particular industry or career-path perspective, and our findings aim to fill this gap. As far as the authors know, no such research has been done into this phenomenon in the PSM field.

## 2.3 *Gendered language as systemic discrimination*

Research also examines structural and systemic discrimination, which takes the form of practices and policies that perpetuate discrimination (Morrison and Von Glinow, 1990). Most countries have legislated against gender discrimination in the workplace, and explicit references to, for example, gender or years of experience tends to contravene these laws. However, more subtle and pervasive means of discrimination still exist. We draw on SDT (Sidanius and Pratto, 1999), which focuses on the institutional-level mechanisms that strengthen and preserve existing group-based inequalities. These mechanisms are so embedded within society that they are unconscious, and most people are unaware of them (Deutsch, 2006; Gaucher et al., 2011). According to SDT, societies converge towards group-based hierarchies (Pratto et al., 2006). Institutional discrimination is the primary mechanism that perpetuates bias between groups (Gaucher et al., 2011).

Several factors or explanations can cause group-based inequalities. Still, we follow a recent stream of literature (Askehave and Zethsen, 2014; Gaucher et al., 2011; Hodel et al., 2017; Horvath and Sczesny, 2016), which proposes that gendered wording, *i.e.*, masculine- and feminine-themed words, is: “an unacknowledged, institutional-level mechanism of inequality maintenance” [Gaucher et al., (2011), p.109]. Gendered wording distinguishes between masculine-themed *agentive* (e.g., ambition, status, achievement, and independence) and feminine-themed *communal* (e.g., caring, connection, and sharing) words used in job advertisements.

The initial contact point between employers and job seekers is very often the job advertisement (Rynes and Cable, 2003), and the specificity and type of information communicated in the form

of the language used can influence the decision on whether an applicant will apply for a job (Lievens and Chapman, 2019). As: “Linguistic forms which refer to individuals impact mental representations of these individuals” (Horvath and Sczesny (2016), and if masculine forms are used, it will have the effect of attracting male and deterring female applicants.

For example, Askehave and Zethsen (2014), in a study of 39 Danish executive job advertisements, found that every job advertisement was gender-biased, with the descriptions of traits needed for the position conforming to stereotypical male characteristics. This was confirmed in a study of students who also ascribed masculine identity to most of the extracts from these job advertisements.

Females’ representation is severely lacking, particularly in senior roles across industries. One study (Horvath and Sczesny, 2016) showed how gendered language, gender-neutral language, and gender-fair language (using both pronouns and nouns) discriminate or include females. Even in gender-neutral languages, where a noun is not gendered, it can still be assumed to be gendered to its most common use, male. Their study showed that German-language job advertisements using masculine generics only, masculine forms with (m/f) written after, and word pairs that included both female and male nouns and pronouns affected the hiring of females. They found that females were seen as less of a fit for roles when either the masculine generic or masculine with (m/f) were used, even though males and females were perceived as equally competent. However, females and males were regarded as a good fit for the role when word pairs of nouns and pronouns were used. In a similar study (Bosak and Sczesny, 2008), both male and female participants felt more suitable for a role when both males and females were portrayed in the job advertisement.

Although research has identified that job advertisements are still heavily gendered, Gaucher et al.’s (2011) experimental study showed what happens to individuals when gendered language is used. They found that masculine-themed words used in job advertisements deterred females from applying and that job advertisements with masculine words were perceived as more male-dominated. Further, they identified that the sense of belongingness (the sense that either gender would belong or not belong in this occupation) had more effect than a sense of ability or skills to do the job advertised. Supportive of SDT, there was little impact on males of adverts with feminine-themed words as men, as the dominant gender, are not threatened, so feminine-themed words had no impact on their sense of belonging. It is interesting to note that not a single participant stated that the wording of the job advertisement played a role in their decision of whether they would apply for the job, meaning that wording plays an unconscious role and can be used as an insidious tool for continued male dominance and inequality. That is why it is essential to highlight and ensure that male-gendered words are not used in job advertisements.

According to SDT, gendered language in job advertisements is used, perhaps unconsciously and imperceptibly, to keep females out of male-dominated jobs and occupations (Gaucher et al., 2011). Unfortunately, even when feminine wording is used, it can be problematic. Fondas (1997) stated that even though the current literature cites more feminine traits such as emotion, intuition, and people orientation as crucial to successful managers, these characteristics are valued highly in males but are devalued in females. However, the continuing and problematic nature of the language used in job advertisements has been shown to discourage females from applying for positions (Askehave and Zethsen, 2014; Bem, 1974; Gaucher et al., 2011).

Researchers have used language-focused analysis to evaluate the presence of gendered text across a range of job advertisements (e.g., Ningrum et al., 2020; Castilla and Rho, 2023) and in specific fields, e.g., construction (Askehave and Zethsen, 2014), start-up funding (Kanze et al., 2018), finance internships (Oldford and Fiset, 2021), libraries (Tokarz and Mesfin, 2021),

information technology (Breese et al., 2020), psychology (Fatfouta, 2021), and leadership (Eichenauer et al., 2022). This paper, therefore, aims to establish the possibility of systemic barriers in the PSM field by using a language-based research method to explore the extent of the gendered language across the hierarchical range of PSM advertisements. In addition, we go beyond much of the extant gendered language research by analysing the words themselves, which offers a more nuanced approach to understanding how job advertisements are constructed.

### 3 Methodology

#### 3.1 Data collection and sample

To answer our research question, 365 PSM job advertisements were collected from the Glassdoor (Glassdoor, 2023) job board website in three English-speaking countries (Ireland, the United Kingdom, and the USA from November 2021 to September 2022 (see Table 1 for sample characteristics). We limited our search to large companies (over 1,000 employees according to Glassdoor specifications), as large companies tend to have dedicated PSM teams spanning the hierarchical levels (see below). This figure is comparable to other research that used job advertisements as their sources of data in different contexts, such as 180 in logistics (Kovács et al., 2012), 150 in librarians (Clyde, 2002) and 381 in finance (Oldford and Fiset, 2021). We identified the hierarchy level for which the advertisement was posted, using the four levels discussed in Mulder et al. (2005), along with an additional most senior PSM role: Assistant Buyer, Buyer, Senior Buyer, Purchasing Manager and Head of Purchasing/Procurement.

**Table 1** Sample characteristics

Country	Number (%)	Position	Number (%)
Ireland	66 (18.1 %)	Assistant Buyer	77 (21.1 %)
United Kingdom	149 (40.8 %)	Buyer	82 (22.5 %)
USA	150 (41.1 %)	Senior Buyer	69 (18.9 %)
		Purchasing Manager	78 (21.4 %)
		Head of Purchasing/ Procurement	59 (16.2 %)
Total	365 (100 %)		365 (100 %)

#### 3.2 Data analysis

The advertisements were saved individually in Microsoft Word format and analysed using the Linguistic Inquiry and Word Count (LIWC) software. This tool allows us to explore the language aspects of the advertisements, including the word count and frequencies, extract context, and output the results in various graphs, word clouds and spreadsheets.

To specifically study the gendered language in the advertisements, we utilised a pre-validated dictionary of words (Pietraszkiewicz et al., 2019) that serves as a proxy for either the masculine (=agentic) or feminine (=communal) dimension. The agentic words are overall oriented towards achievements (with words such as *earn*, *decide*, or *aspire*). In contrast, communal words are focused more on communication or following rules (e.g., *law*, *accept*, or *negotiate*). The complete list of words can be found at Pietraszkiewicz et al. (2019) and note that the words include word stems that can be expanded, such as the word *achiev\**, which, when expanded, can identify, for example, both *achievement* and *achieve*. Pietraszkiewicz et al. (2019) note that this approach sometimes leads the software to pick up unrelated words (e.g., *socialism* for

*social\** stem). Yet, to overcome this, we searched the words that appeared in lower numbers ( $\leq 20$ ) on the final list and found no words that needed to be discarded.

For each advertisement, two variables were calculated in LIWC software: the relative number of agentic words and the relative number of communal words, calculated as an overall number of agentic (communal) words divided by the overall word count in the advertisement. A complete list of the agentic and communal words was also extracted in a separate table for further analysis. A word cloud for agentic and communal words was generated (see Figure 1 in the next section).

We used a One-way ANOVA test on all five groups within the hierarchy to analyse the potential glass-ceiling and sticky-floor effects. To further analyse the possible existence of a sticky-floor effect, we grouped the junior job advertisements (assistant buyers and buyers) and those with more senior roles (senior buyers, purchasing managers and heads of purchasing/procurement). We compared the junior and senior roles for agentic language with an independent *t*-test. We assume more communal language in the junior groups and more agentic language in the advanced roles and therefore focused on one-sided significance in the *t*-tests. The resulting data with advertisements and percentage of language references were imported into IBM SPSS Statistics software for further analysis.

## 4 Findings and discussion

### 4.1 Job level

We generated two key findings in our analysis of communal and agentic language levels in job advertisements across the PSM hierarchical range. First, there does not appear to be a clear glass-ceiling effect in achieving the most senior positions in the PSM job hierarchy (see Table 6 in the Appendix), as the results of an ANOVA test (see Table 7 in the Appendix) did not show a significant difference across the positions ( $p=.131$  for communal language and  $p=.477$  for agentic language). Nevertheless, there is a decrease in communal language from the assistant to the higher positions (from 6.73 at the assistant level to 6.13 at buyer and 5.98 at senior buyer levels).

Second, as shown in Table 3, there is evidence for the assumption that more communal language is found in junior role job advertisements ( $p=.040$ ) when grouping the advertisements into junior and senior roles (see methodology for more details). This means that advertisements focusing on early-career PSM professionals contain significantly more communal language, which is more attractive to females. However, this decreases significantly at the more senior level and remains low across this range. However, no evidence has been found that agentic language significantly deviates between junior and senior job advertisements ( $p=0.322$ ).

**Table 2** Means for Communal and Agentic language use in Junior and Senior PSM job advertisements

	Job level	N	Mean	Std. Deviation	Std. Error Mean
Agentic language	Junior job level	159	5.8989	1.74259	.13820
	Senior job level	206	5.8185	1.51653	.10566
Communal language	Junior job level	159	6.4243	2.44564	.19395
	Senior job level	206	6.0173	1.80523	.12578



**Table 3** Independent Samples Test of Communal and Agentic language use in Junior and Senior PSM job advertisements

		Levene's Test for Equality of Variances		t-test for Equality of Means				95% Confidence Interval of the Difference			
		F	Sig.	t	df	Significance One- Sided p	Two- Sided p	Mean Difference	Std. Error Difference	Lower	Upper
Agentic language	Equal variances assumed	8.054	.005	.470	363	.319	.638	.08037	.17089	-.25568	.41643
	Equal variances not assumed			.462	314.014	.322	.644	.08037	.17396	-.26191	.42265
Communal Language	Equal variances assumed	14.99 9	<.001	1.829	363	.034	.068	.40706	.22253	-.03055	.84467
	Equal variances not assumed			1.761	280.587	<b>.040</b>	.079	.40706	.23116	-.04798	.86210

#### 4.2 Specific language usage

We also analysed the specifics of the gendered language used in the advertisements to provide a more nuanced perspective of the language used in PSM job advertisements beyond examining its hierarchical effects. Figure 1 represents the word clouds for agentic and communal language, each presenting the 30 most common words in the advertisements. This demonstrates the general nature of the dictionaries, with the agentic referring to the individual applying (*you, your*), their overall actions (*will, do, take*), their competences (*skills, knowledge, know, expertise*), and the action-oriented part of the PSM job (*effective, responsible, objectives, goals, achieve, making*). Conversely, communal references refer to the company advertising the job (*we, our, us*), the supportive nature of the PSM job (*team, support, assistant, partner, inclusive*) and communication aspects (*communication, negotiation, negotiate, relationship*).

**Figure 1** Word clouds for agentic (left) and communal (right) words, each visualising 30 most frequently appearing words



#### 4.3 Job-level effects on agentic and communal references

In addition to the word clouds, we also analysed whether the words differ based on the job level and reflects the key finding (discussed above) of the identification of a sticky-floor effect between junior (i.e., assistant buyer and buyer) and senior job levels (i.e., combining senior buyer, purchasing manager and head of purchasing). The results are in Table 3 for agentic and

Table 4 for communal words. Each table features only the 20 words that appear most often in the advertisements, so if the word appears twice in an advertisement, it is counted twice in the tables. The tables present the total number of words and the average frequency in which the word appears per 1,000 words (so that if the word *you* appears five times in an advertisement that is 500 words long, a ten would be recorded; the final number in the table represents the mean for all advertisements), and the rank when ordered by the previous column. The tables also feature the *p*-values of an independent samples *t*-test which compares the means of the frequencies of the words on the two job levels.

Six of the 20 most often featured agentic words differ significantly by job level (*skills*, *opportunities*, *needs*, *effective*, *risk* and *responsibility*). While plural *opportunities* feature more often in advertisements for higher level jobs (“to identify *opportunities* to drive the process”; “maximize cost saving *opportunities*”), *opportunity* does not differ across levels (and even features slightly more often in the junior-level advertisements, albeit not significantly). Similarly, all of the *needs*, *effective*, *risk* and *responsibility* words are featured more often in the senior-level advertisements, potentially reflecting the more demanding nature of the job (“solicit key stakeholders *needs*”; “meet business unit *needs*”; “deliver *effective* line management”; “identifying cost-*effective* sourcing routes”; “monitor the supplier *risk*”; “identify sources to mitigate *risk*”; “to have primary *responsibility*”; “to take *responsibility* for own development”).

Perhaps somewhat surprisingly, the word *skills* features more often in junior-level advertisements, suggesting that other words are used for the knowledge, skills, abilities, and other characteristics at senior levels (for example, *competencies* and *capabilities* both feature slightly more often in the senior-level advertisements). This is reflected in the relatively technical context in which the word appears (“technical *skills* are desired”; “time management *skills*”; “excellent excel analytical *skills*”).

**Table 4** Job-level effects on agentic references (asterisk denoting significance level, with \*  $p \leq 0.05$ ; \*\*  $p \leq 0.01$ ; \*\*\*  $p \leq 0.001$ ), top 20 references displayed in the table

Reference	Total			Junior job level			Senior job level			<i>p</i>
	N	Per 1 000 words	Rank	N	Per 1 000 words	Rank	N	Per 1 000 words	Rank	
You	1503	6.758	1	674	7.524	1	829	6.163	1	.073
Will	1349	6.077	2	532	6.182	2	817	5.996	2	.742
Skills	869	4.527	3	374	5.395	3	495	3.853	3	.002 **
Your	591	2.492	4	263	2.745	4	328	2.295	4	.207
Knowledge	368	1.749	5	143	2.006	5	225	1.551	6	.079
Opportunities	334	1.461	6	109	1.216	10	225	1.652	5	.026 **
Responsible	320	1.431	7	117	1.395	8	203	1.459	7	.749
Opportunity	316	1.402	8	129	1.473	7	187	1.346	8	.466
responsibilities	249	1.369	9	101	1.559	6	148	1.221	9	.078
Do	272	1.192	10	121	1.373	9	151	1.051	11	.143
Make	225	0.965	11	73	0.806	13	152	1.088	10	.12
Able	185	0.912	12	68	0.947	11	117	0.885	15	.718
Competitive	188	0.868	13	79	0.936	12	109	0.816	17	.395
Needs	194	0.827	14	53	0.612	15	141	0.993	12	.004 **
Effective	179	0.766	15	50	0.566	17	129	0.922	14	.013 **
Successful	150	0.708	16	50	0.601	16	100	0.791	18	.184
Risk	169	0.646	17	27	0.257	43	142	0.949	13	<.001 ***

responsibility	141	0.620	18	36	0.364	30	105	0.818	16	.011 **
Effectively	140	0.577	19	51	0.625	14	89	0.540	24	.497
Need	131	0.566	20	45	0.491	21	86	0.624	20	.267

Eight out of the 20 most seen communal words differ significantly across the levels, as measured by an independent samples t-test of the average number the reference that appears in the advertisement so that if the word appears ten times in an ad that is 500 words long, a 0.02 is recorded in the table. There is a noticeable difference in the words *assistant* and *assist* as the junior-level jobs are sometimes referred to as assistant buyer in the advertisement, and they can be therefore seen as more supporting in nature (“*assist* the buyer”; “*assist* with compiling monthly reports”).

Furthermore, the words *we*, *communication*, and *group* appear more frequently in junior job advertisements. However, this is not significant, with *we* primarily referring to the company advertising the job (“*we* want to improve”, “*we* need talented people”), *communication* to communicating with clients or suppliers, or communication skills (“verbal and written *communication* skills”; “manage vendor *communication*”), and *group* either to cooperating within the procurement function (“escalate issues to *group* procurement”) across different companies within one ownership structure (“develop a system across the *group* for major categories”), organisational processes (“input into on-going *group* integration and change”) or to denote the organisation type (“Bank of Ireland *group*” – this last one was similarly distributed across junior and senior level job ads).

*Team* and *negotiation* appear relatively more frequently in senior-level job advertisements. *Team* (and *teams* to a lesser extent, albeit not significantly) point towards the more senior and managerial nature of these jobs (“lead cross-functional *team* in executing sourcing”; “lead a procurement *team* across the portfolio. Finally, *negotiation* refers to the skills (“strong *negotiation* skills”) or activity (“lead sourcing and *negotiation*”).

**Table 5** Job-level effects on communal references (asterisk denoting significance level, with \*  $p \leq 0.05$ ; \*\*  $p \leq 0.01$ ; \*\*\*  $p \leq 0.001$ ), top 20 references displayed in the table

Reference	N	Total		Junior job level			Senior job level			$p$
		Per 1 000	Rank	N	words	Rank	N	words	Rank	
Our	1892	8.089	1	823	8.755	1	1069	7.573	1	.136
We	1708	7.258	2	737	7.957	2	971	6.716	2	.097
Team	996	4.418	3	342	3.987	3	654	4.752	3	.050 **
Support	709	3.312	4	290	3.480	4	419	3.181	4	.449
Services	440	1.954	5	161	1.866	6	279	2.022	5	.573
Us	366	1.577	6	150	1.574	7	216	1.579	6	.984
relationships	311	1.415	7	97	1.249	10	214	1.544	7	.159
communication	245	1.295	8	106	1.463	8	139	1.165	10	.099
Service	293	1.246	9	97	1.093	11	196	1.365	8	.186
Group	259	1.186	10	122	1.457	9	137	0.975	12	.084
Teams	265	1.167	11	80	0.967	13	185	1.322	9	.062
assistant	185	1.133	12	178	2.502	5	7	0.072	95	<.001 ***
negotiation	178	0.859	13	41	0.513	22	137	1.128	11	<.001 ***
Offer	181	0.819	14	72	0.818	15	109	0.819	13	.993
Help	182	0.765	15	68	0.712	18	114	0.806	14	.501

supporting	155	0.729	16	72	0.834	14	83	0.647	15	.217
education	137	0.665	17	52	0.759	16	85	0.592	17	.285
Career	144	0.656	18	66	0.759	17	78	0.577	18	.163
Assist	118	0.608	19	81	1.041	12	37	0.273	46	<.001 ***
Partners	123	0.548	20	54	0.587	20	69	0.518	22	.613

## 5 Contributions, limitations, and future research

In the first part of our analysis, more communal (female-oriented) than agentic (male-oriented) language is used in PSM job advertisements, and this is a somewhat counterintuitive finding. However, despite the lack of a specific glass-ceiling effect (i.e., at the Head of Purchasing/Procurement level) due to language, a sticky-floor impact on the transition from more junior levels (Assistant Buyer and Buyer) was identified. This suggests a systemic barrier to female progression to more senior PSM job roles. We then analysed the use of the words themselves. We found six of the 20 most often featured agentic words (skills, opportunities, needs, effective, risk and responsibility), and eight of the 20 most seen communal words differed significantly by job level.

Our findings contribute to a recent focus on gender responsiveness in PSM, which has tended to (understandably) focus on supplier diversity programmes to enhance engagement with female-led supplier organisations (i.e. Oluka et al., 2020; Orser et al., 2021; Wu and Sirgy, 2014) and a smaller body of work that is starting to recognise gender-based differences in the PSM function (e.g. Croom et al., 2021; Lawrence et al., 2018). We also contribute to the broader SDT-driven literature by providing a nuanced perspective of the systematic barriers in the form of a sticky floor in a specific industrial field (PSM).

The limitations of our research are mainly methodological and reflect those found in other work using gendered language dictionaries to analyse job advertisements. For example, Pietraszkiewicz et al. (2019) identify that “frequency counts as a method of texts analysis do not allow for monitoring the linguistic function of a word in the sentence” (p. 879), which can somewhat blunt the context of what the text is trying to convey. PSM context-specific words within the advertisements, such as risk, may also be over-represented due to their apparent association with risk management activities inherent within PSM roles. All advertisements were taken from a single job board website (Glassdoor), as this allowed for a consistent format to be obtained. This creates the possibility of some standardisation of text/words being used. However, we attempted to mitigate this by not selecting advertisements from recruitment companies, which would undoubtedly have influenced (possibly through the adaptation and perpetuation of existing advertisements) the design of the advertisement. Job board companies tend to take a less active role in developing the advertisements but act as a link between job seekers and organisations with job requirements.

This research is positioned as a necessary first step in addressing systemic barriers in the PSM workforce as it identifies the existence of a sticky floor for females to progress through the PSM organisational hierarchy. Further research is needed to explore the effects of gender-based language on potential applicants, and experimental research offers a suitable method to address this. We also recognise that this is a complex phenomenon and that other factors undoubtedly maintain the existence of gender-based barriers. However, a concerted and focused approach can only break these, and our research offers evidence of these barriers that can be addressed. Developing gender-neutral language in advertisements is an opportunity, and the PSM field could look to other functional areas for best practices in how to do this.

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## Appendix 1: Glass ceiling effects

Table 6: Means for Communal and Agentic language use across hierarchy levels in PSM job advertisement

		95% Confidence Interval for					
				Std.		Mean	
		N	Mean	Deviation	Std. Error	Lower Bound	Upper Bound
Agentic language	Assistant Buyer	77	5.7431	1.69970	.19370	5.3573	6.1289
	Buyer	82	6.0451	1.77987	.19655	5.6540	6.4362
	Senior Buyer	69	5.7739	1.68013	.20226	5.3703	6.1775
	Purchasing Manager	78	6.0035	1.50789	.17074	5.6635	6.3434
	Head of Procurement	59	5.6261	1.30946	.17048	5.2849	5.9673
	Total	365	5.8535	1.61708	.08464	5.6871	6.0200
	Communal language	Assistant Buyer	77	6.7332	2.60486	.29685	6.1420
Buyer		82	6.1343	2.26376	.24999	5.6369	6.6317
Senior Buyer		69	5.9843	1.96024	.23599	5.5134	6.4553
Purchasing Manager		78	6.1500	1.82480	.20662	5.7386	6.5614
Head of Procurement		59	5.8803	1.59638	.20783	5.4643	6.2964
Total		365	6.1946	2.11481	.11069	5.9769	6.4123

Table 7: ANOVA test results for Communal and Agentic language use across hierarchy levels in PSM job advertisements

		Sum of Squares	df	Mean Square	F	Sig.
Agentic language	Between Groups	9.191	4	2.298	.878	.477
	Within Groups	942.648	360	2.618		
	Total	951.839	364			
Communal language	Between Groups	31.671	4	7.918	1.786	.131
	Within Groups	1596.285	360	4.434		
	Total	1627.957	364			