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# Academic women: A study on the queen bee phenomenon



## Mulheres na academia: Um estudo sobre o fenômeno queen bee

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## Abstract

**Purpose:** In masculine and extremely competitive organizational contexts, women who succeed in their careers exhibit behaviors that hinder, rather than help, other women to develop professionally. This phenomenon is called queen bee. In this article, we aim to identify whether the queen bee phenomenon is present in higher education institutions (HEI) in Brazil.

**Originality/value:** Although the queen bee phenomenon as a gender inequality metaphor is not a recent topic in scientific literature, its analysis in Brazilian HEI reveals the original character of the study.

**Design/methodology/approach:** The quantitative study has a sample of 495 women who work in HEI. The MANOVAs test was used to verify the hypotheses.

**Findings:** The results show that the knowledge domain impacts more on the queen bee phenomenon than the variables of the organizational context. In addition, women in leadership positions are more engaged at work, have more masculine traits, identify themselves with women at the top of the hierarchy, deny gender discrimination and tend to be more adept at meritocratic discourse than women who are not in leadership positions, confirming that women who hold leadership positions in Brazilian HEI present queen bee traits.

**Keywords:** gender, higher education institutions, queen bee phenomenon, women in charge of responsibility, women in male scientific fields

## Resumo

**Objetivo:** Em contextos organizacionais masculinos e extremamente competitivos, mulheres que ascendem na carreira apresentam comportamentos que embaraçam, mais que ajudam, outras mulheres a se desenvolver profissionalmente. Esse fenômeno é denominado abelha-rainha. Este artigo tem como objetivo identificar se o fenômeno *queen bee* está presente nas instituições de ensino superior (IES) do Brasil.

**Originalidade/valor:** Ainda que o fenômeno abelha-rainha como metáfora de desigualdade de gênero não seja tema recente na literatura científica, sua análise em IES brasileiras revela o caráter original do estudo.

**Design/metodologia/abordagem:** Trata de estudo quantitativo com amostra de 495 mulheres que atuam na academia. As análises estatísticas e verificações das hipóteses foram realizadas a partir do teste MANOVAs.

**Resultados:** Os resultados apontam que o domínio do conhecimento impacta mais o fenômeno *queen bee* que as variáveis do contexto organizacional. Além disso, mulheres em cargos de liderança são mais engajadas no trabalho, apresentam mais traços masculinos, identificam-se mais com mulheres do topo da hierarquia, negam mais a discriminação de gênero e aderem mais ao discurso meritocrático que aquelas que não estão em cargos de chefia, confirmando que mulheres que ocupam cargos de liderança em IES brasileiras aderem a traços de *queen bee*.

**Palavras-chave:** gênero, instituições de ensino superior, fenômeno abelha-rainha, mulheres em cargo de responsabilidade, mulheres em domínios científicos masculinos

## INTRODUCTION

Gender inequalities have been long reported (Rossi, 1965) in the academy, presenting, thus, a higher number of publications and citations by male authors (Larivière et al., 2013), higher investments for their research during the career, and male supremacy at the top of the academic career (Bedi et al., 2012). Studies on the performance of women in universities, developed in the Netherlands (Ellemers et al., 2004), France (Deschamp, 2018), Italy (Marini & Meschitti, 2018), United Kingdom (Fotaki, 2013), Australia (Probert, 2005), Switzerland (Faniko et al., 2021), and the United States (Shen, 2013) point out the persistent challenges for female researchers. These studies denounce the absence of gender parity at the highest administrative and scientific levels, in addition to wage differences in all areas.

In Brazil, gender disparity occurs mainly in areas predominantly male, prestigious, and with higher wages (Barros & Mourão, 2018), such as Science, Technology, Engineering, and Mathematics (STEM), and it increases when evaluating the most advanced stages of researchers' careers (Oliveira et al., 2019). Official data from the National Council for Scientific and Technological Development (Conselho Nacional de Desenvolvimento Científico e Tecnológico) – CNPq, 2016a) show that the number of PhD women in the areas of exact sciences and engineering corresponds, respectively, to 32.19% and 24.95%. Only 34% of research grants in the exact and earth sciences, and 36% in engineering and computer sciences were for women (CNPQ, 2016b). According to the Personal Statistical Panel (Painel Estatístico de Pessoal) (PEP, 2020) from the federal government, until March 2020 women represented 28% of the free full professors in higher education. Such data reveal that the Brazilian academy is a male environment, by just taking into account the number of professionals according to gender, which is a first level of analysis.

In masculine and extremely competitive organizational contexts, women who succeed in their careers exhibit behaviors that hinder, rather than help, other women to develop professionally, and these are called queen bees. The expression first appeared in the scientific literature, as the queen bee phenomenon (Staines et al., 1974).

In line with Ellemers (2001), this study adopts a theoretical perspective of gender identity according to which the queen bee behavior is considered an individual response to gender threat, experienced by women working in male organizations (Derks et al., 2015). These answers allow some women to reach leadership positions in environments where gender identity and

stereotyped gender expectations are disadvantages for women (Ellemers, 2018). In addition, they are particularly more critical of their coworkers' commitment and skills and collaborate directly for keeping barriers to other women rise (Faniko et al., 2016), being less favorable to gender equality opportunity programs (Faniko et al., 2017a).

The article begins from the low female representation in some scientific areas, in leadership positions, and in the upper stages of the academic career at Brazilian universities (PEP, 2020). It also considers the academic environment as a male context (Ellemers et al., 2004; Faniko et al., 2021). Therefore, this study aims to identify if the queen bee phenomenon occurs in Brazilian higher education institutions (HEI).

Regarding the extension of the bibliometric search undertaken for this article, there were no studies in the Scopus, Web of Science, Spell, and Scielo databases that analyzed the queen bee phenomenon in Brazilian universities. In studies on gender and work, Arvate et al. (2018) used the phenomenon to understand the influence of female political leadership in reducing gender differences in private and public organizations; however, the authors did not address HEI. Given the above, this article brings a theoretical contribution in view of its originality for studies on female career, Brazilian universities, and the queen bee phenomenon.

In addition, this article is socially relevant, since it sheds light on contextual elements that affect the queen bee phenomenon. It also stimulates a reflection on the role of work organizations in the emergence of queen bee traits and on the responsibility (or not) of a group of women – those who managed to succeed in their careers – for the low female representation in high positions of the organizational hierarchy.

## **GENDER INEQUALITY IN THE ACADEMY: THE FAVORABLE CONTEXT FOR QUEEN BEE'S EMERGENCE**

Rossi (1965) was one of the pioneers in questioning the small number of women in science. After more than five decades, low female representation in the high echelons of universities persists (Van den Brink & Benschop, 2012), both in the scientific and administrative areas (Britton, 2017). Women are rarer when we consider people that are at the top of their careers in teaching and research and in positions of dean and vice dean (Britton, 2017).

Women, especially those who work in traditionally male knowledge fields, such as STEM, report exposure to sexist interactions, at least occasionally, with coworkers. In addition to sexist interactions, the structure and

culture of the academic organization play an important role in the persistence of gender discrimination in universities (Benschop & Brouns, 2003; Britton, 2017).

The symbol of the ideal scientist as the one who dedicates themselves exclusively to research, without personal distractions (such as childcare), the myth of meritocracy as the main responsible for academic excellence (Van den Brink & Benschop, 2012) and the vertical organizational hierarchy are strongly responsible for the production and reproduction of gender inequalities at the university (Smith-Doerr, 2004). Although the implementation of a set of affirmative policies aims to expand the representation of academic women, they are not very efficient when organizational structure and culture favor male superiority (Benschop & Brouns, 2003).

Therefore, female professors face more barriers to advance in their careers and receive investments for scientific research (Ellemers et al., 2004), besides having a lower probability of promotion (Van den Brink & Benschop, 2012). By examining the glass ceiling phenomenon in the Italian academy, Paola et al. (2018) identified that women are less likely to be promoted in their careers. Men are about 24% more likely to be promoted in Italy (Marini & Meschitti, 2018), while in the Netherlands women must have a production 2.5 times higher than men to achieve the same score of scientific competence (Benschop & Brouns, 2003), which shows a relevant gender discrimination. Tiainen and Berki (2019) identified underrepresentation of women in the fields of science and technology in Finland, although the country is a reference in valuing gender equality.

These mostly male environments present several mechanisms of discrimination, many of them not even perceived by women themselves, which strengthens and perpetuates gender inequality (Britton, 2017). Nevertheless, studies warn that in a space dominated by men, some women tend to adopt a behavior similar to the gender that represents the most prestigious status, as a strategy to distance themselves from the negative evaluation strongly linked to the female (Britton, 2017). Derks et al. (2016) identified that women, when holding high hierarchical positions, tend to perpetuate the discriminatory culture, instead of questioning the disadvantage faced along their paths.

However, such behaviors are not female biological characteristics, but consequences of the negative experiences of gender discrimination that they have faced along their career in male-dominated environments (Faniko et al., 2016; Derks et al., 2011a, 2011b; Ellemers & Barreto, 2009).

In contrast to the biological origin of the queen bee phenomenon, one of the factors that strengthens the lack of support among women refers to

the working conditions, which enhance masculinity and discredit women's professional competence (Webber & Giuffre, 2019). Derks et al. (2011b) observe that women are not naturally prone to compete with each other, but, instead, the attributes of working conditions, such as the male, competitive and unfavorable to female development environment, stimulate the emergence of characteristic behaviors of the queen bee phenomenon.

Working conditions, more than the reduced number of women in organizations, raise the presence of traits of the queen bee phenomenon. Thus, different forms of social support among employees are important, as they tend to increase the probability of exchanging resources among coworkers. The support reduces the effects of work stress, contributes to employee performance and improves well-being (Cardoso et al., 2019).

The culture of support among colleagues guides the theory of organizational support (Hayton et al., 2012). This theory highlights that employees evaluate how the organization perceives their contribution to the environment and how concerned the organization is with their well-being (Rhoades & Eisenberger, 2002). Organizational support allows employees to feel accepted by the organization, creating positive feelings of satisfaction and belonging. In addition, the perception of organizational support results in a greater psychological well-being for workers. Exploratory studies that sought to understand the meaning of the individuals' feeling of psychological well-being identified that self-acceptance and the sense of competence in the environment where they work are determining factors for the individual's satisfaction, self-esteem, and morale (Ryff, 1989).

One of the main criticisms to the queen bee phenomenon study is that it strengthens negative stereotypes of women at work and blame them for the low female representation at the top of the organizational hierarchy, instead of investigating how social contexts, processes, and workplace practices interfere with their opportunities for professional rise (Mavin, 2008). Hence, it reinforces the idea that efforts should concentrate on understanding how working conditions and organizational practices that favor men affect supportive relationships among women (Webber & Giuffre, 2019). Therefore, in line with the aforementioned studies, the first two hypotheses are suggested.

- H1: The organizational environment favorable to well-being and cooperation among colleagues negatively affects the emergence of queen bee characteristics.
- H2: Female lecturers-researchers and administrative employees that work in a traditionally male knowledge area present more traits of the



queen bee phenomenon than women who work in mixed or female knowledge areas.

## CHARACTERISTICS OF THE QUEEN BEE PHENOMENON

Some studies show that women in leadership positions improve career opportunities for other women (Arvate et al., 2018) and assume the role of model or inspiration for coworkers in lower positions (Burke et al., 2006). However, research indicates that solidarity behavior is not unanimous, and there are women in high positions that hinder the professional rise of colleagues in subordinate positions or in early career, a fact that characterizes the queen bee phenomenon (Derks et al., 2016; Ellemers et al., 2004).

Basically, three features define the phenomenon: 1. women who are in the highest hierarchical position describe themselves with more male traits; 2. they depart, physically and psychologically, from women who are at the beginning of the career, or in a subordinate position; and 3. they legitimize and keep the *status quo* of the gender hierarchy (Derks et al., 2015, 2016; Faniko et al., 2016).

Men and women commonly think that male characteristics provide a better status and more power in organizations than the female ones (Derks et al., 2011a). Thus, a strategy used by women to fit into organizations traditionally dominated by men consists of a *male self-description* (Derks et al., 2011a, 2016). Ellemers et al. (2004), in a research carried out in the Netherlands and Italy, observed that female professors and scientists describe themselves with masculine terms, have less connection with female stereotypes and with other women, besides showing a sharp career ambition.

Faniko et al. (2016), in a study conducted in Switzerland and Albania, found out that women who are at a more advanced stage of their careers describe themselves as more masculine and ambitious than early career women. Thus, queen bees classified their professional commitment as higher than that of other women, in addition to self-rating themselves as more ambitious than women in inferior positions or in early career (Derks et al., 2011a; Faniko et al., 2016).

Male self-description also relates to the fact that female managers have made greater personal sacrifices to achieve career success and shows that these efforts make them feel different from junior women (Faniko et al., 2017a). Ellemers et al. (2004) found that most male professors had a wife and children, however, female teachers who rose in the scientific career were mostly single and had no children. In addition, female professionals stress

that they have made substantial sacrifices regarding relationships with partners, friends, and in their decision of whether or not to have children, showing that successful women's careers are marked by difficulties (Ellemers et al., 2012). Thus, senior women who had made difficult choices in their professional paths expect junior women to make similar sacrifices in seeking career success (Faniko et al., 2017a).

Women in leadership positions resist having relationships with those who are at a lower level, as an answer to the threat to gender identity. They notice this approach as a risk to their image, which they need to preserve carefully, as they tend to be more negatively affected by failures due to the gender, regardless of their hierarchical level (Duguid, 2011). Successful women tend to see themselves as different from women who make stereotypically feminine choices, who reject their careers in favor of family and personal demands (Ellemers, 2014). However, successful women do not distance themselves from other women who occupy a similar professional position and who classify themselves as equally masculine (Faniko et al., 2016). Thus, the queen bee phenomenon is not characterized by a lack of widespread identification with women, since women in leadership positions showed support to those who made similar choices and followed such paths.

The legitimization of the gender hierarchy can be identified by denying discrimination in male organizations; by adhering to the meritocratic speech at the workplace, even if the conditions are not entirely similar for the genders; and by not supporting measures to fight gender inequality, such as quotas (Faniko et al., 2017b; Derks et al., 2016a, 2016b).

To draw attention to discrimination highlights gender, while activating negative beliefs about femininity. It is threatening to accept that your gender will determine important results in life, regardless of your individual achievements and the personal sacrifices you are willing to make (Ellemers, 2018). Not recognizing *a priori* group disadvantage offers women who aspire to command positions the hope of achieving their goals.

Considering the denial of gender discrimination, workplaces are seen as meritocratic environments, that is, women would simply need to work hard, with the least possible distractions, in order to be successful (Webber & Giuffrè, 2019). Besides, meritocracy emerges in universities under the disguise of academic excellence, in which merit standards are built by academics who benefit themselves and their peers by applying this mechanism (Van den Brink & Benschop, 2012).

The belief in the neutrality of the meritocratic system influences people to resist affirmative action policies (Crosby et al., 2013). An example of

these policies is gender quotas that aim to support the insertion of women in the labor market and reduce the quantitative gender imbalance in organizations (Faniko et al., 2017b). However, these measures are frowned upon by some women (Ellemers & Barreto, 2009) who do not accept the “red carpet” extended to professionals in early career, while they had to overcome numerous obstacles to reach a strategic position in the organization (Faniko et al., 2017b).

Female managers may resist to support the implementation of quotas that benefit coworkers who have not faced obstacles similar to theirs in the career and be less willing to help them; however, they defend quotas for women at their same hierarchical level and who have gone through similar sacrifices, even if they are direct competitors (Faniko et al., 2017b). Thus, the third hypothesis is suggested.

- H3: Female researchers-professors and university administrators who hold commissioned or management positions present more traits of the queen bee phenomenon than women who do not.

## METHOD

This quantitative research aims to identify the presence of the queen bee phenomenon in Brazilian HEI. These organizations were chosen as the study’s context because they are the stage of veiled discrimination, with a tendency to camouflage the existence of gender inequality (Barros & Mourão, 2018), although the academic environment is a scenario that fosters discussion on relevant issues and on those in social evidence, as is the case of gender inequality. Hence, it is pertinent to investigate if these professionals act to increase or reduce such inequalities.

### Instrument

For data collection, a questionnaire was used, composed of socio-occupational issues (sex, age, education, occupation area, working time, whether or not a leadership position) and a set of scales that assessed the characteristics relevant to the queen bee phenomenon. To analyze how working conditions affect the emergence of the queen bee behavior, the perceived organizational support (Hayton et al., 2012) and organizational climate and well-being scales (Patterson et al., 2005) were used.

In order to assess the male self-description trait, the career engagement scale (Ellemers et al., 1998) and male self-description scale (Scott & Brown, 2006) were adopted. For these items, each participant was asked to evaluate herself, to make a horizontal assessment (considering colleagues at the same hierarchical level) and descending assessment (considering colleagues at a lower hierarchical level or in early career). To examine the identification with different female subgroups, the identification scale with different women subgroups was used (Faniko et al., 2016). Finally, to assess the legitimization of the gender hierarchy, the discrimination denial (Derks et al., 2011b), adherence to meritocratic principles (Davey et al., 1999) and quota support scales (Faniko et al., 2012) were applied.

Psychometric and reliability tests of the scales were conducted, through which Cronbach's alpha, variance, Kaiser-Meyer-Olkin (KMO) test, and Bartlett's sphericity were tested. Table 1 shows these tests, which were used in the questionnaire. The scales show significant and reliable results, and the only necessary change was the exclusion of an item from the identification scale.

The scales, used originally in English, were translated by the researchers and, later, submitted to the process of back translation, done by an English-speaking professor. There were few differences between the back translation and the original items of the scale in English, which, after a last review and debate, led researchers to finish the translating process of the scales used. The items were arranged randomly in the questionnaire, in order to avoid response bias. A pre-test with four university professors was carried out, and they requested minor changes in some items.

**Table 1**  
*Psychometric and scale reliability results*

	Scale	No. of items	Cronbach's alpha	Variance	KMO	Bartlett's sphericity
<b>Organizational context</b>	Well-being	2	0.83	84.90%	0.5	$\chi^2 = 489.44, 1 \text{ gl}, p < 0.000$
	Perceived organizational support	2	0.66	75.51%	0.5	$\chi^2 = 197.15, 1 \text{ gl}, p < 0.000$
	Career engagement	6	0.77	46.46%	0.78	$\chi^2 = 1071.38, 15 \text{ gl}, p < 0.000$
	Male self-description	4	0.58	43.37%	0.64	$\chi^2 = 284.79, 6 \text{ gl}, p < 0.000$
<b>Male self-description</b>	Horizontal engagement	6	0.86	60.07%	0.86	$\chi^2 = 1321.99, 15 \text{ gl}, p < 0.000$
	Horizontal male self-description	4	0.78	61.60%	0.75	$\chi^2 = 584.22, 6 \text{ gl}, p < 0.000$
	Descending engagement	6	0.91	71.29%	0.89	$\chi^2 = 2125.18, 15 \text{ gl}, p < 0.000$
	Descending male self-description	4	0.83	67.27%	0.73	$\chi^2 = 843.13, 6 \text{ gl}, p < 0.000$
<b>Identification</b>	Identification with different subgroups	4	0.5	38.65%	0.55	$\chi^2 = 292.51, 6 \text{ gl}, p < 0.000$
	Discrimination denial	2	0.84	83.64%	0.5	$\chi^2 = 525.92, 1 \text{ gl}, p < 0.000$
<b>Legitimization</b>	Quota support	3	0.89	83.16%	0.69	$\chi^2 = 1485.55, 3 \text{ gl}, p < 0.000$
	Adherence to meritocratic principles	5	0.68	46.38%	0.71	$\chi^2 = 597.62, 10 \text{ gl}, p < 0.000$

Source: Elaborated by the authors.

## Participants

A total of 957 responses was gathered, from which 254 were removed for missing values higher than 5% of the questionnaire, resulting in a final sample of 703 respondents. The initial sample had 208 men (29.6%) and 495 women (70.4%). For this study, only data collected from women were examined regarding the queen bee phenomenon. The sample is composed of respondents aged between 20 and 72 years (43 years average) from 88 Brazilian HEI. The Federal University of Goiás (12.5%), Federal University of Cariri (8.1%), Santa Catarina State University (7.5%), and Federal University of Viçosa (5.9%) were the institutions with the highest number of responses. As for the field of activity, Applied Social Sciences (19.7%), Health Sciences (16.5%), Human Sciences (16%), and Exact Sciences (10.9%) represented the highest percentage.

**Table 2**  
*Participants' characterization*

Women (n = 495)			
Personal variables			
Age		Education	
From 20 to 25	1.40%	Higher education complete	1.60%
From 26 to 30	6.00%	Graduate studies	97.40%
From 31 to 35	16.20%	Did not answer	1.00%
From 36 to 40	19.80%	State	
From 41 to 45	20.50%	Goiás	19.40%
From 46 to 50	12.60%	Minas Gerais	18.80%
From 51 to 55	11.80%	Ceará	15.20%
From 56 to 60	5.90%	Santa Catarina	9.30%
Over 60	4.40%	São Paulo	5.70%
Did not answer	1.40%	Paraná	5.70%
Marital status		Rio Grande do Norte	5.30%
Single	27.50%	Rio de Janeiro	5.10%
Married/stable union	60.20%	Rio Grande do Sul	4.40%

(continue)

**Table 2 (continuation)*****Participants' characterization***

Women (n = 495)			
Personal variables			
Marital status		State	
Divorced	11.70%	Bahia	2.60%
Widow	0.60%	Espírito Santo	1.80%
Children		Alagoas	1.40%
Yes	55.20%	Others (n = 11)	5.10%
No	44.80%	Did not answer	0.20%
Income			
Up to 2 minimum wages	1.20%	From 8 to 12 minimum wages	40.60%
From 2 to 4 minimum wages	6.90%	From 12 to 15 minimum wages	20.20%
From 4 to 8 minimum wages	22.00%	Over 15 minimum wages	9.10%
Occupation variables			
Position		Time of activity	
Professor	88.90%	Up to 3 years	24.60%
Administrative/technical professional	5.70%	From 4 to 6 years	19.30%
Did not answer	5.50%	From 7 to 9 years	12.10%
University		From 10 to 12 years	20.40%
UFG	12.50%	From 13 to 15 years	5.80%
Ufca	8.10%	From 16 to 18 years	3.60%
Udesc	7.90%	From 19 to 21 years	2.80%
UFV	5.70%	From 22 to 24 years	2.20%
Ufersa	4.20%	From 25 to 27 years	4.00%
UFFS	3.60%	From 28 to 30 years	1.80%
UFMG	3.40%	Over 30 years	2.20%
UFJ	2.60%	Did not answer	1.20%
UFU	2.40%	Field of activity	
Ufcet	2.40%	Agricultural Sciences	5.90%

(continue)

**Table 2 (conclusion)*****Participants' characterization***

Women (n = 495)			
Occupation variables			
University		Field of activity	
UFSJ	2.40%	Biological Sciences	6.30%
Unila	2.20%	Health Sciences	16.50%
Unileão	2.00%	Exact and Earth Sciences	10.90%
UFABC	2.00%	Human Sciences	16.00%
UFRJ	2.00%	Applied Social Sciences	19.70%
UFES	1.60%	Engineering	7.90%
Unilab	1.40%	Linguistics, Literature and Arts	5.70%
UFSB	1.40%	Did not answer	11.10%
Unirio	1.20%	Working hours per week	
Unifei	1.20%	Up to 20 hours	3.60%
Ufla	1.20%	From 21 to 44 hours	44.80%
Others (n = 67)	21.30%	From 45 to 55 hours	36.60%
Did not answer	6.10%	More than 55 hours	14.90%
Do you hold a commissioned or management position currently?			
Yes	26.10%	No	73.90%

*Source:* Elaborated by the authors.

## Procedures for data collection and analyses

Data collection was online, through the SurveyMonkey platform, between February and April 2020. The authors searched the e-mail addresses of professors-researchers and technical employees from the HEI's websites and built a database with more than 8,000 contacts. At the beginning, the questionnaire informed the research objective (the Free and Informed Consent Term) and ensured compliance with the ethical criteria for research in Applied Social Sciences. It was followed by the sociodemographic issues and the scales to assess possible features of the queen bee phenomenon. Through



e-mails sent to the database contacts, professionals had the right to accept or refuse participating in the research; hence, a non-probabilistic convenience sampling was chosen.

For the hypothesis test, the MANOVA statistical test was used, considering  $p < 0.05$  significant. The procedures were operationalized through SPSS, based on specialized literature (Field, 2009; Dancey & Reidy, 2006). To examine H1, the items of well-being and cooperation were first categorized as a single variable, identified as organizational context. In a second stage, the answers were recoded, so that values 1 and 2 were considered a negative work context; 3, 4, and 5 were considered an intermediate context; and values 6 and 7 were positive work contexts. Recoding was done to allow comparison between the groups regarding the queen bee traits. To test H2, the fields of knowledge were ranked into male (Agricultural Sciences, Exact and Earth Sciences, and Engineering), female (Biological Sciences, Health Sciences, Human Sciences, and Linguistics, Literature and Arts), and mixed (Applied Social Sciences), based on Barros and Mourão (2020a). For the H3 test, information on the respondent's current position (whether or not a management position) was used.

## RESULTS

### Organizational context

Female professionals who work in a more favorable environment evaluate their commitment to the career as higher than women who are in an unfavorable organizational context,  $F(4.068) = 2.492$ ,  $p < 0.05$ ,  $n^2 = 0.016$ ; and self-describe themselves with more masculine features,  $F(9.62)$ ,  $p < 0.001$ ,  $n^2 = 0.038$ . These same women rated their female co-workers, who are at the same organizational level, as more professionally engaged,  $F(3.141)$ ,  $p < 0.05$ ,  $n^2 = 0.013$ ; and more masculine,  $F(7.849)$ ,  $p < 0.001$ ,  $n^2 = 0.031$ , than those who work in an unfavorable environment. In the descending assessment, women at the beginning of their careers in an organization with a favorable environment were also evaluated as more committed,  $F(1.967)$ ,  $p = 0.141$ ; and more masculine,  $F(3.463)$ ,  $p < 0.05$ ,  $n^2 = 0.014$ .

When assessing identification with different women subgroups, those who work in organizations with a favorable environment identified themselves more with women who are at the top of the hierarchy,  $F(12.308)$ ,  $p < 0.001$ ,  $n^2 = 0.048$ ; and also showed a closer relationship with women in early career or who prioritize their family life,  $F(5.578)$ ,  $p < 0.05$ ,  $n^2 = 0.022$ . In addition, women working in a favorable environment legitimize the *status quo* of gender hierarchy, by defending that these organizations are meritocratic environments,  $F(2.668)$ ,  $p = 0.07$ ,  $n^2 = 0.011$ ; denying the existence of gender discrimination in HEI,  $F(10.257)$ ,  $p < 0.001$ ,  $n^2 = 0.04$ ; and showing a lower average support for quota policies, compared to women who work in an environment with less cooperation among colleagues and an unfavorable well-being climate,  $F(1.470)$ ,  $p = 0.221$ . Although an environment favorable to well-being and with greater organizational support perceived affects positively women's identification with other female groups, it is not a determining factor for the reduction queen bee traits regarding the proximity to male behaviors and legitimization of gender hierarchy. Therefore, the first hypothesis of the study was denied. Table 3 shows the results of the analysis of the independent variables: organizational context, field of activity, and management position.

**Table 3**  
**Results of Manova tests**

	Organizational context						Field of activity						Management position																		
	Unfavorable		Intermediate		Favorable		Degree of freedom = 2.492			Male			Mixed			Female			Degree of freedom = 2.437			Leadership position			Without			Degree of freedom = 1.493			
	Average (SD)	Average (SD)	Average (SD)	Average (SD)	F	p	n <sup>2</sup>	Average (SD)	Average (SD)	Average (SD)	Average (SD)	Average (SD)	Average (SD)	Average (SD)	Average (SD)	Average (SD)	F	p	n <sup>2</sup>	Average (SD)	Average (SD)	Average (SD)	F	p	n <sup>2</sup>	Average (SD)	Average (SD)	F	p	n <sup>2</sup>	
Self-evaluation - commitment	5.63 (0.82)	5.58 (0.82)	5.79 (0.60)	5.87 (0.60)	4.068	0.018*	0.016	5.67 (0.70)	5.58 (0.79)	5.64 (0.82)	0.339	0.713	0.002	5.67 (0.77)	5.63 (0.80)	0.223	0.637	0													
Self-evaluation - masculinity	5.78 (0.67)	5.79 (0.67)	6.13 (0.46)	6.13 (0.46)	982	0.000*	0.038	5.81 (0.71)	5.84 (0.64)	5.88 (0.71)	0.463	0.63	0.002	6.06 (0.54)	5.77 (0.67)	18.73	0.000*	0.037													
Assessment of horizontal commitment	5.41 (0.88)	5.33 (0.87)	5.61 (0.87)	5.61 (0.87)	3141	0.044*	0.013	5.34 (0.78)	5.34 (0.88)	5.47 (0.92)	1.076	0.342	0.005	5.48 (0.82)	5.37 (0.37)	1.43	0.231	0.003													
Assessment of horizontal masculinity	5.38 (1.02)	5.40 (0.87)	5.83 (0.74)	5.83 (0.74)	7849	0.000*	0.031	5.38 (0.85)	5.41 (1.03)	5.52 (0.88)	1.096	0.335	0.005	5.64 (0.86)	5.40 (0.92)	6.63	0.010*	0.013													
Assessment of descending commitment	5.30 (1.07)	5.33 (1.03)	5.57 (0.93)	5.57 (0.93)	1.967	0.141	0.008	5.32 (0.89)	5.31 (1.09)	5.41 (0.72)	0.431	0.65	0.002	5.43 (0.94)	5.34 (1.05)	0.85	0.357	0.002													
Assessment of descending masculinity	5.12 (1.04)	5.21 (1.00)	5.48 (0.77)	5.48 (0.77)	3463	0.032*	0.014	5.16 (0.96)	5.19 (1.09)	5.28 (0.95)	0.702	0.496	0.003	5.30 (1.00)	5.21 (0.98)	0.851	0.357	0.002													
Identification with women at the top of the hierarchy	5.42 (1.06)	5.50 (0.96)	6.04 (0.73)	6.04 (0.73)	12.308	0.000*	0.48	5.53 (0.87)	5.30 (1.19)	5.67 (0.96)	4.776	0.009*	0.021	5.76 (0.96)	5.5 (0.98)	6.82	0.009*	0.014													

(continue)

Table 3 (conclusion)  
Results of *Manova tests*

	Organizational context						Field of activity						Management position																	
	Unfavorable		Intermediate		Favorable		Degree of freedom = 2.492			Male			Mixed			Female			Degree of freedom = 2.437			Leadership position			Without			Degree of freedom = 1.493		
	Average (SD)		Average (SD)		Average (SD)		F	p	n <sup>2</sup>	Average (SD)		Average (SD)		Average (SD)		Average (SD)		F	p	n <sup>2</sup>	Average (SD)		Average (SD)		F	p	n <sup>2</sup>			
Identification with women at the bottom of the hierarchy	4.37 (1.15)		4.41 (1.06)		4.83 (1.02)		5.578	0.004*	0.022			4.45 (1.06)		4.53 (0.99)		4.47 (1.18)		0.13	0.878	0.001			4.56 (1.25)		4.43 (1.03)		2.7	0.242	0.003	
Discrimination denial	2.74 (1.66)		2.73 (1.56)		3.64 (1.90)		10.257	0.000*	0.04			3.31 (1.81)		2.38 (1.45)		2.83 (1.69)		8.325	0.000*	0.037			2.80 (1.69)		2.91 (1.68)		0.439	0.508	0.001	
Meritocracy	5.61 (0.91)		5.47 (0.91)		5.71 (0.85)		2.668	0.070**	0.011			5.71 (0.72)		5.56 (0.87)		5.46 (0.95)		2.983	0.050*	0.013			5.69 (0.83)		5.50 (0.92)		3.45	0.041*	0.008	
Quota support	4.58 (1.71)		4.60 (1.68)		4.24 (1.89)		1.47	0.231	0.006			3.98 (1.75)		4.69 (1.65)		4.75 (1.70)		8.602	0.000*	0.038			4.79 (1.61)		4.45 (1.76)		3.61	0.058**	0.007	

Source: Elaborated by the authors.

\* Significant values p < 0.05; \*\* marginally significant values p < 0.07.

## Field of activity

The second hypothesis suggests that women who work in a mostly masculine field of knowledge have more queen bee traits. The results showed that, although women who work in traditionally feminine areas present higher averages for career commitment and male presentation, they did not show significant differences between groups' means.

Examining approximation to different subgroups, the comparisons showed evidence that women who work in female areas are more similar to women who are at the top of the hierarchy,  $F(4.776) = 2.473$ ,  $p < 0.01$ ,  $n^2 = 0.021$ . Women who work in a typically male field show a higher average regarding discrimination denial,  $F(8.325)$ ,  $p < 0.001$ ,  $n^2 = 0.037$ ; they adhere more to the meritocratic speech,  $F(2.983)$ ,  $p = 0.050$ ,  $n^2 = 0.013$ ; and have a lower average for support to affirmative action policies,  $F(8.602)$ ,  $p < 0.001$ ,  $n^2 = 0.038$ . Thus, H2 was confirmed, given that women who work in traditionally male areas have more queen bee traits than those who work in traditionally female areas.

## Management position

Women in leadership positions describe themselves,  $F(18.731) = 1.493$ ,  $p < 0.001$ ,  $n^2 = 0.037$ , and evaluate their coworkers at the same organizational level as more masculine,  $F(6.63)$ ,  $p < 0.05$ ,  $n^2 = 0.013$ . The results did not show a significant difference in self-assessment and in horizontal and descending assessments of career commitment between women who hold or not management positions.

Women with leadership positions have a closer relationship with women at the same organizational level,  $F(6.82)$ ,  $p < 0.05$ ,  $n^2 = 0.014$ , and showed non-significant results when compared to women at the bottom of the hierarchy,  $F(2.70)$ ,  $p = 0.242$ . Women in leadership positions presented favorable responses to meritocracy in HEI,  $F(3.41)$ ,  $p < 0.05$ ,  $n^2 = 0.008$ . However, a marginally significant interaction shows that women in these positions support more affirmative action policies than women who do not have a leadership position,  $F(3.61)$ ,  $p = 0.058$ ,  $n^2 = 0.007$ . Thus, H3 was confirmed, because women in leadership positions were identified as having more queen bee traits when compared to professionals that do not hold these positions.

## DISCUSSION

In this study, the impact of the organizational environment on queen bee traits was examined, by understanding its complexities and seeking to minimize the negative repercussions conveyed by the media (Khazan, 2017). The analysis of differences in means between groups showed that, in a favorable organizational context, women presented higher levels of commitment and masculinity than those in an unfavorable context, thus refuting the first hypothesis, which suggested that well-being at work and cooperation among pairs reduce queen bee traits. This result indicates that, even though perceived organizational support leads to a more positive view of their role within the organization and to job satisfaction (Rhoades & Eisenberger, 2002), women still need to acquire agency traits to fit in the academy (Ellemers et al., 2004; Faniko et al., 2021).

In an unfavorable context, intragroup evaluations showed that the difference between the way women assess themselves and assess women in early career, or in subordinate positions, is higher than when they do the same assessments in favorable contexts. It means that, in unfavorable contexts, women perceive themselves as more different from one another, which is reinforced by the identification average with other women subgroups. Women in favorable contexts identify themselves more with both women at the top and at the bottom of the organizational hierarchy than those who work in unfavorable environments. Hence, data from intragroup analyses confirm the arguments by Faniko et al. (2016) and Derks et al. (2016) that an organizational context less women-friendly favors the emergence of the queen bee phenomenon. This reaffirms that the tendency to distance themselves from other women at the workplace is not a biological behavior, natural to women, but a behavioral strategy motivated by implicit and explicit organizational policies and practices, which associate success with male traits (Faniko et al., 2021).

As for the legitimization of gender hierarchy, women in favorable organizational contexts showed a lower average for quota support and a higher average for meritocracy and discrimination denial. Regarding the latter, it can be questioned if the higher average for the group of women in a favorable environment actually refers to a strategy to legitimize gender hierarchy, or if well-being at work and cooperation among peers at these universities really make them environments where gender discrimination is less frequent. Using scales adapted from Hayton et al. (2012) and Patterson et al. (2005) to assess the work context, the conclusion was that a better

context does not overcome the characteristics of the academic environment, such as being a male space (Rossi, 1965; Ellemers et al., 2004; Britton, 2017; Faniko et al., 2021), where meritocratic speech prevails (Van den Brink & Benschop, 2012). However, the positive context was favorable for extending relationships and identification among women (Faniko et al., 2016; Derks et al., 2016).

In turn, women who work in male knowledge fields have a higher average for engagement than women in female fields, but these show a higher average for adherence to stereotypically male behaviors. The findings are coherent with the theory of gender identity (Derks et al., 2016; Ellemers, 2001), as there are indications that, in order to reverse an adverse position attributed to the characteristics of a disadvantaged group, women in traditionally male environments withdraw from this group and adopt typical traits of the prestigious group.

As for the identification with women subgroups, women in traditionally male knowledge fields have less identification with women at the top of their careers than with those in female fields. Such result shows, at first, a decrease in queen bee characteristics; however, by examining the difference of intragroup means, women in male fields identify themselves more with women at the top of the hierarchy than with women at the bottom and identify themselves less with women from both subgroups than women from female fields. The lesser identification with other female subgroups is a queen bee trait, in this case stronger among women working in male fields. Ellemers et al. (2004) and Faniko et al. (2021) observed this fact in a study with women researchers; and Derks et al. (2011a, 2011b), in a traditionally male work context – a police institution.

In addition, women working in male fields showed a higher average for discrimination denial and meritocracy and less support to quotas, thus, expressing higher legitimization of gender hierarchy than women working in female areas. This result confirms Derks et al. (2011a), who claim that women in a mostly male-dominated environment, such as the police service, tend to deny the existence of gender discrimination in these spaces and not support the implementation of affirmative action policies. This behavior can be understood as an attempt to distance themselves from female gender stereotypes, seen as negative (Ellemers et al., 2012), or because they believe that quota systems disqualify women's efforts and achievements (Webber & Giuffrè, 2019).

Although there is empirical evidence that merit is not the only criterion for academic career advancement (Marini & Meschitti, 2018; Benschop &

Brouns, 2003), women who work in male fields reinforce the meritocratic speech, which helps to camouflage the gender bias, present in the selection and promotion processes at universities. These findings help to understand the queen bee phenomenon beyond the intrinsic characteristics of women and provide evidence that the context where they work affects the emergence of such behaviors (Ellemers, 2014; Derks et al., 2011a).

Women in leadership positions who made up the sample are more committed to work and have more stereotypically male traits than those without management positions (Faniko et al., 2016). National surveys show that women that hold management positions in the academy, or wish to, even doubt their ability to take on this role. They both need the approval of male colleagues to feel more secure at work and strive to replace traits understood as feminine by behaviors and attitudes assigned to men (Barros & Mourão, 2020b).

Likewise, women leaders evaluate themselves, within the group, as more committed and masculine than women in early career or in subordinate positions. Thus, our study findings can create positive expectations regarding the performance of female teaching-researchers who hold leadership positions in HEI, since in these positions they perceive themselves as more committed to their careers and claim to have made more sacrifices in other areas of life for professional development. Such results are similar to those of women who belong to the corporate world, who consider themselves more committed and as having more agency traits than their colleagues in early career or in subordinate positions (Faniko et al., 2017b).

However, the result that shows that women in leadership positions identify themselves more with women at the top of their careers (Ellemers, 2014; Faniko et al., 2016) and distance themselves physically and psychologically from women in subordinate positions can weaken their leadership. They need to reconsider this detachment, since having the support of colleagues from different hierarchical levels is important for their performance as a leader (Derks et al., 2016).

Finally, although women leaders are more favorable to quotas than women who do not hold commissioned positions, they deny gender discrimination more and are more favorable to the meritocratic speech as a path to career advancement than women who do not hold management positions. Hence, women leaders need to be more attentive to discrimination nuances. Denying it can be a reaction against accepting that their gender will determine important results in life (Ellemers, 2018) and makes it difficult to fight inequality, because it makes discrimination less identifiable.



Replicating the meritocratic speech deserves attention, as there is empirical evidence that the assessment of women's competencies at universities is more thorough than the men's (Van den Brink & Benschop, 2012).

The system based on professional excellence and merit makes it difficult for gender biases, which affect the declassification of women in selection processes, to be identified as such (Webber & Giuffre, 2019). In the sample, women in leadership positions showed queen bee traits of adherence to male behaviors (Derks et al., 2016), stronger identification with female groups that are at the top of the organizational hierarchy (Faniko et al., 2016), and denial of gender discrimination (Derks et al., 2011a; Britton, 2017), while agreeing that meritocracy is the path to academic excellence (Van den Brink & Benschop, 2012).

## FINAL REMARKS

This study aimed to verify whether women working in Brazilian HEI show queen bee traits. For this purpose, in addition to examining the strength of queen bee traits in women in leadership positions, it checked if the variables of organizational context, such as perceived well-being and organizational support, influence them. The classification of women regarding the knowledge fields (traditionally male, female, or mixed) affects the queen bee phenomenon more than a favorable organizational environment.

Women in leadership positions have more traits consistent with the queen bee phenomenon than those who do not hold these positions. They are more committed to work, show more agency behaviors, identify themselves with women at the top of the hierarchy more than with those at the bottom, are more prone to denying gender discrimination and adhere to the meritocratic speech more than women who do not hold management positions. Thus, women in leadership positions in Brazilian HEI adhere to features of the queen bee phenomenon, and their performance in traditionally male knowledge fields favors the expansion of these features.

Although it is difficult to avoid the binary gender perspective, historically built on these two pillars, this perspective was assumed as a weakness of this study. Despite the diversity of the sample, of national scope, the small percentage of women who work in private educational institutions is also a limitation. Thus, future research should compare how the queen bee phenomenon manifests itself in public and private HEI. Suggestions are to validate the scale to assess the phenomenon in the Brazilian context, so that new studies may evaluate other professional categories under its perspective

and address other variables related to the organizational environment, in order to examine their relationship with the emergence of queen bee traits. Quantitative surveys should be associated with qualitative research strategies, so that researchers can triangulate different results and extend the understanding of the phenomenon in Brazil. In addition, given that the queen bee phenomenon is a topic still little examined in cultural contexts other than Europe, a detailed examination of the three dimensions that make up the phenomenon in a national context is suggested.

Finally, we expect that the study will contribute to a broader understanding of the phenomenon and overcome the criticism of the incomplete and mistaken image that media conveys on women who have reached high leadership positions. This article represents a theoretical contribution to studies on the queen bee phenomenon, because, in addition to analyzing its behavioral characteristics, it sought to relate them to the workplace cultural context, besides examining it for the first time in Brazilian HEI. Moreover, the results can assist the university community to reflect on its own practices and organizational structures, in order to change them into less genderified environments, more conducive to the development of female careers.

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