

Sociedad Chilena de Astronomía

Inclusion and Gender Diversity
Group
(translated by
Delmira Flor Gore Marihuen)

CENSUS 2022 Report
First and second Instrument

28 June, 2023



INTRODUCTION

During the last decade, astronomy as a scientific discipline has seen an exponential increase. Among professional academics, doctoral, magistrate, and postdoctoral students, as indicated in statistics data presented by the Chilean Astronomical Society (SOCHIAS, 2022)

The Group of Inclusion and Gender from SOCHIAS has invited the astronomy community to take part in a Census, which has the goal of obtaining data related to diversity and its inclusion in the Chilean astronomy community with the aim of achieve a diagnostic and historical record on the development in this field.

In this occasion, questions (variables) about gender identity, ethnicity and disability are asked; all of which are relevant factors for the field characterization, discrimination and opportunity gaps seen in the field, and the necessity to fix these inequalities.



PURPOSE



The purpose of this Census is to characterize the Chilean astronomy community, from the perspective of diversity and inclusion, which enable the development of a diagnosis and a historical record in the progress on this academic discipline.



METHODOLOGY

Instruments

- Two independent questionnaires were used in order to accurately characterize the participants and their attitudes, opinions, and situations, all while maintaining confidentiality.:

1. Sociodemographic characterization (11 questions)

2. Inquiry about the current astronomy conditions in Chile related to the accessibility, gender equity, equal chances and labour environment (18 questions)

For the safeguard of ethical aspects and information confidentiality, the instruments were elaborated and reviewed by the Advisory committee from the Group of Inclusion and Gender, Ethics Committee of SOCHIAS, Ethics Committee of UDP (certified) and the Directory of SOCHIAS.



METHODOLOGY



Sample

Who:

To the Chilean astronomy community, such as researchers, academics and students, Scientific outreach; Technicians and administrators; Enthusiasts; and anyone who considers themselves part of the community.

When:

First instrument: surveys carried out between 1 and 18 March 2022.
Second Instrument: surveys carried out between 3 January and 18 March 2022..

How:

Self-administered surveys through a Google Forms.

How many:

First Instrument: a total of **470 answers were considered valid.**
Second Instrument: a total of **385 answers were considered valid**

METHODOLOGY

Analysis

For the first survey, after resolving duplicate, non-responsive and incorrectly entered cases, a total of 470 answers were valid. For the second survey, a total of 385 cases were valid.

In both instruments, a descriptive statistics analysis was conducted from the database obtained from Google Form. The data was exported to Excel and SPSS, where the main crossing of the variables of interest was performed.



MAIN RESULTS



Before results: some terms



Sex

Sex is a biological descriptor based on reproductive, hormonal, anatomical, and genetic characteristics. Typical sex categories include male, female, and intersex.¹

Gender

Gender is a multidimensional social and cultural construct that includes gender roles, expressions, behaviors, activities, power dynamics, and/or attributes that a given society associates with being a woman, man, girl, or boy, as well as relationships with each other. As a social construct, gender varies from society to society and can change over time.¹

Sexual Orientation

Each person's capacity for profound emotional, affectional and sexual attraction to, and intimate and sexual relations with, individuals of a different gender, the same gender or more than one gender.²

Gender identity

Each person's deeply felt internal and individual experience of gender, which may or may not correspond to the sex assigned at birth, including the personal sense of the body (which may involve, if freely chosen, modification of bodily appearance or function by medical, surgical or other means) and other expressions of gender, including dress, speech and mannerisms.²

LGBTI

Umbrella term used to denote individuals from the Lesbian, Gay, Bisexual, Trans and Queer/Questioning Community.²

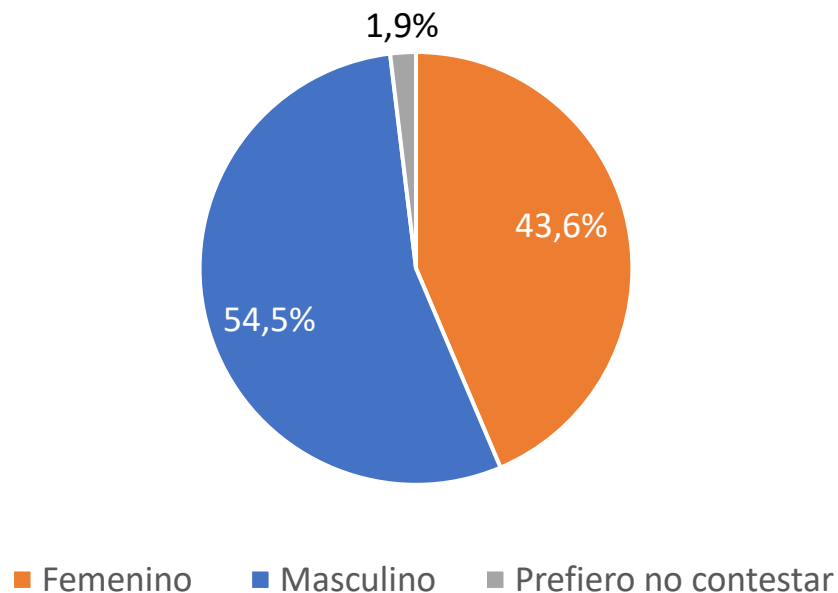
1st SOCHIAS CENSUS REPORT CHARACTERIZATION



Characterization

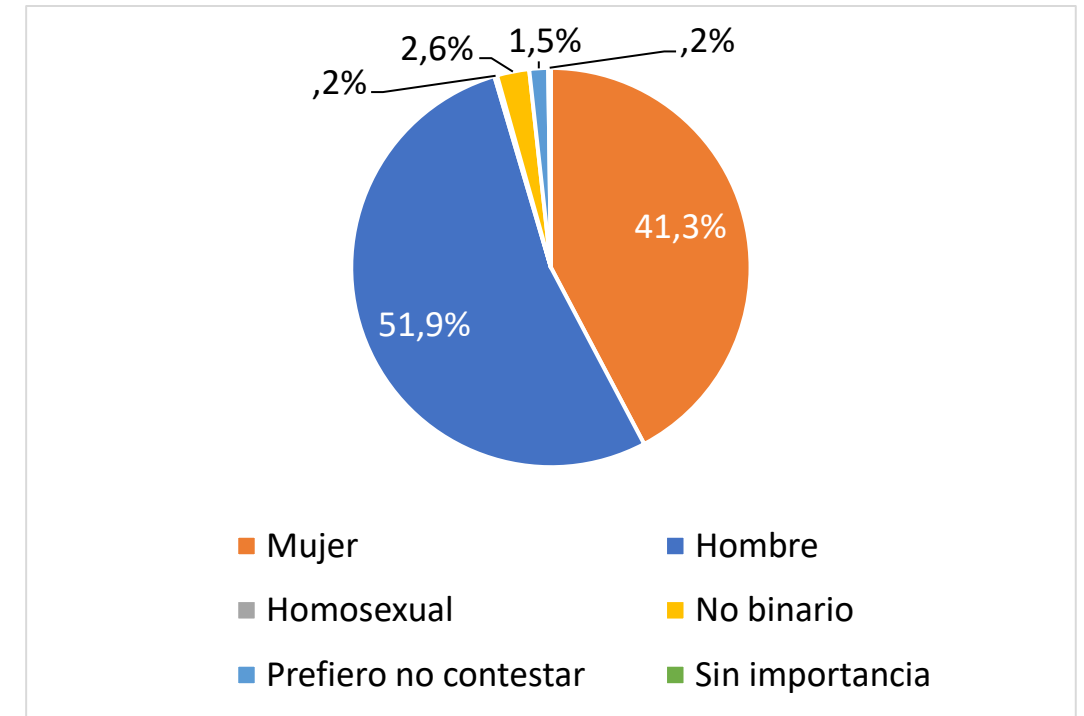
SEX

From the survey respondents (n=470) 54.5% are male, and 43.6% female. Moreover, 1.9% prefer not to answer. This result reveals an equal trend between these categories.



Gender identity

According to gender identity, 93.2% self-identify with usual categories of men (51.9%) or women (41.3%). For non-binary category a 1.5% self-identify with it, Despite the lower percentage, in order to validate the gender diversity within the community, is important to ask about this variable.

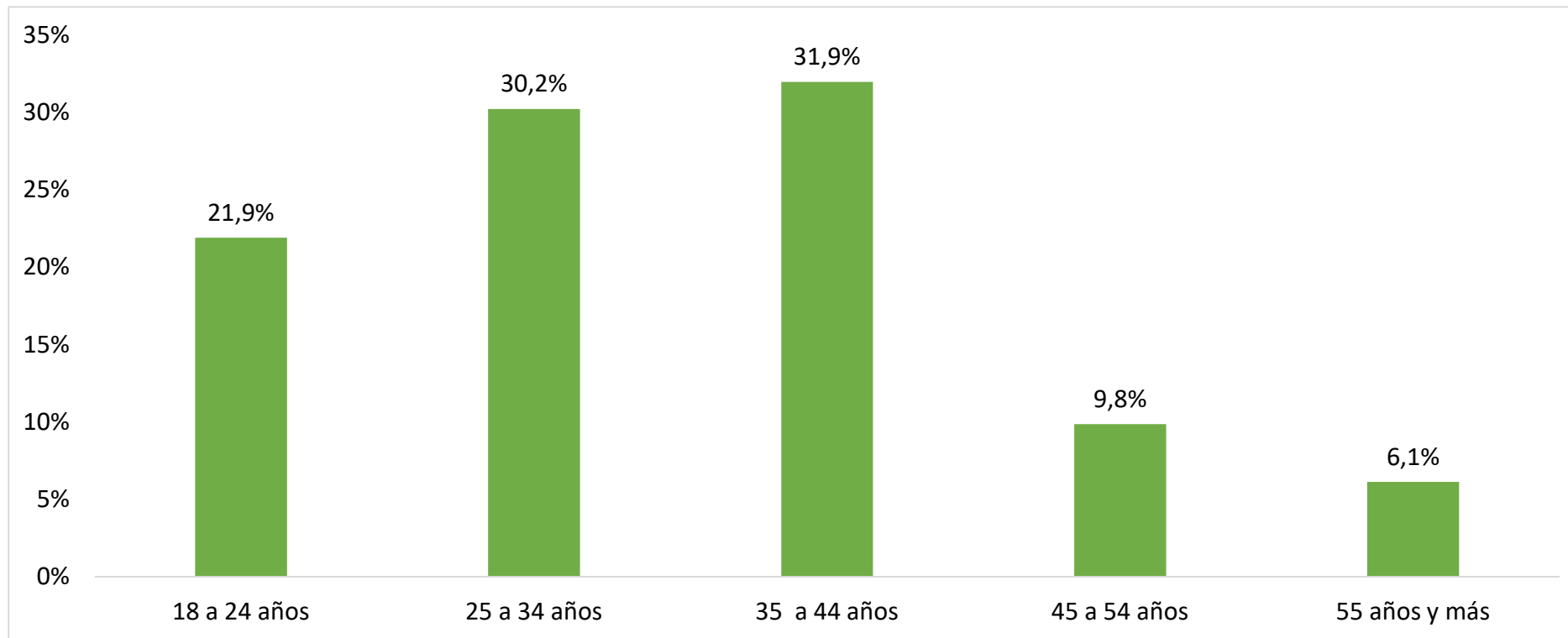


Characterization



AGE

In terms of age, the respondents are concentrated in the 35-44 years old range (31.9%), in second are those between 25-34 years old (30.2%), and lower for groups over 45 years.



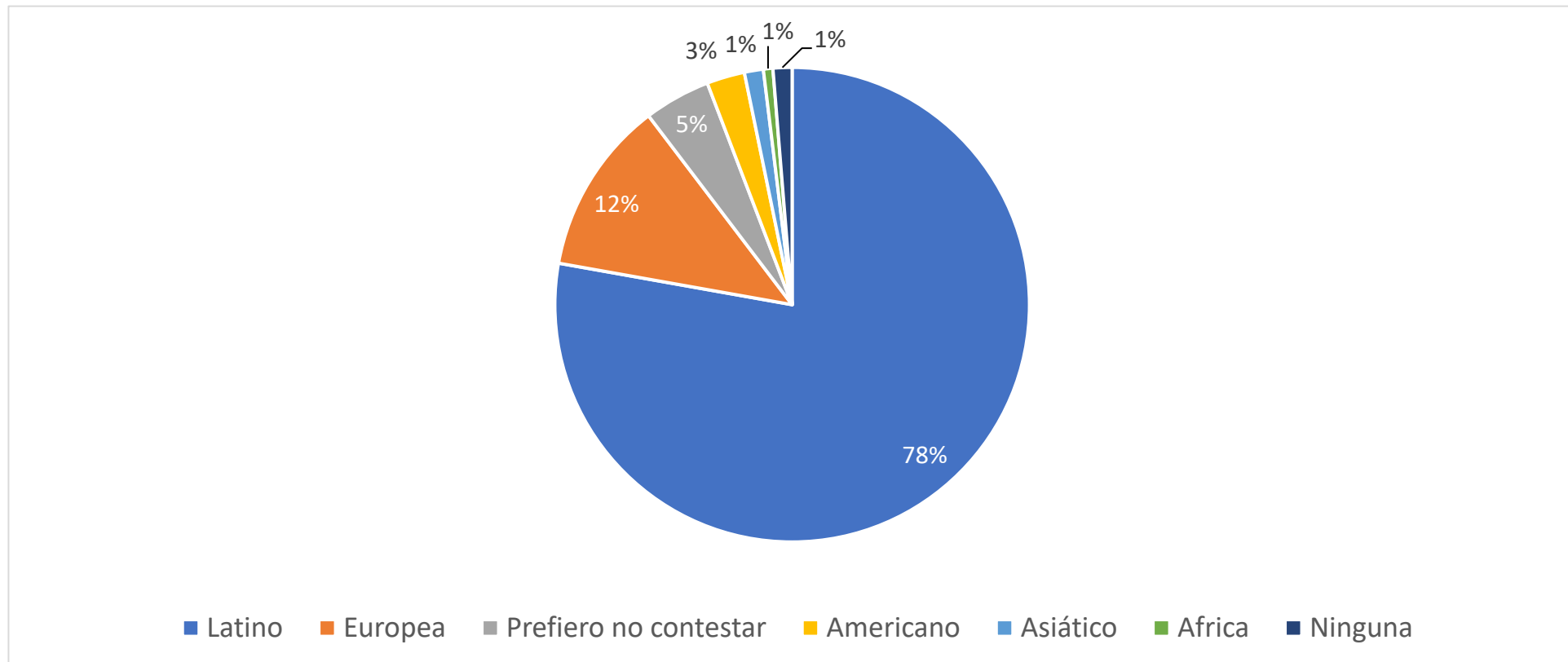
N=470

Characterization



ETHNICITY AND NATIONALITY

In terms of ethnicity, the respondents self-identify, mainly, as “Latin” (78%), followed by 12% of “European”. The fact that 5% selected the option “Prefer not to answer” is striking.



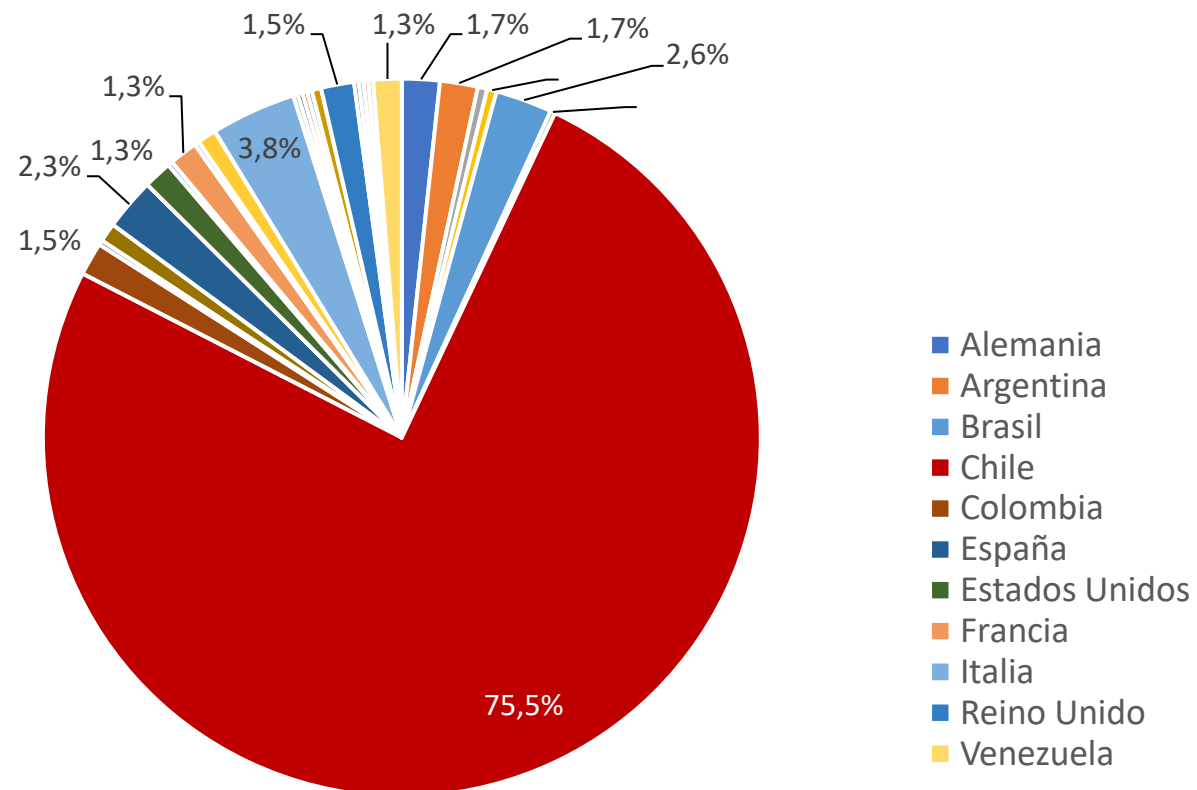
N=470

Characterization



ETHNICITY AND NATIONALITY

The main nationalities are as follows: Chile (75.5%), Italy (3.8%), Brazil (2.6%), Spain (2.3%), Germany (1.7%), Argentina (1.7%), United Kingdom (1.5%), United States (1.3%), France (1.3%) and Venezuela (1.3%).

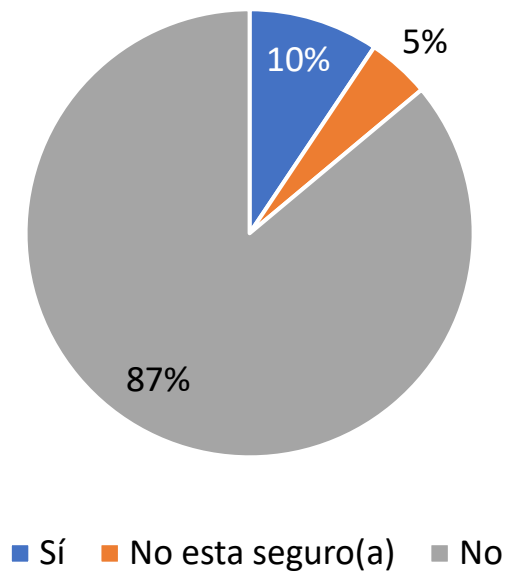


N=470

Characterization

Disability

10% of respondents reported having a disability, 5% are not sure, and 87% reported not having a disability. Visual, mental and physical aspects are the main types of disabilities.



Type of disability	N°	%
Visual	16	4%
Mental	13	3%
Physical	7	2%
Hearing	5	1%
Visceral	3	1%
Not sure	21	5%
No	398	87%
Total	463	100%

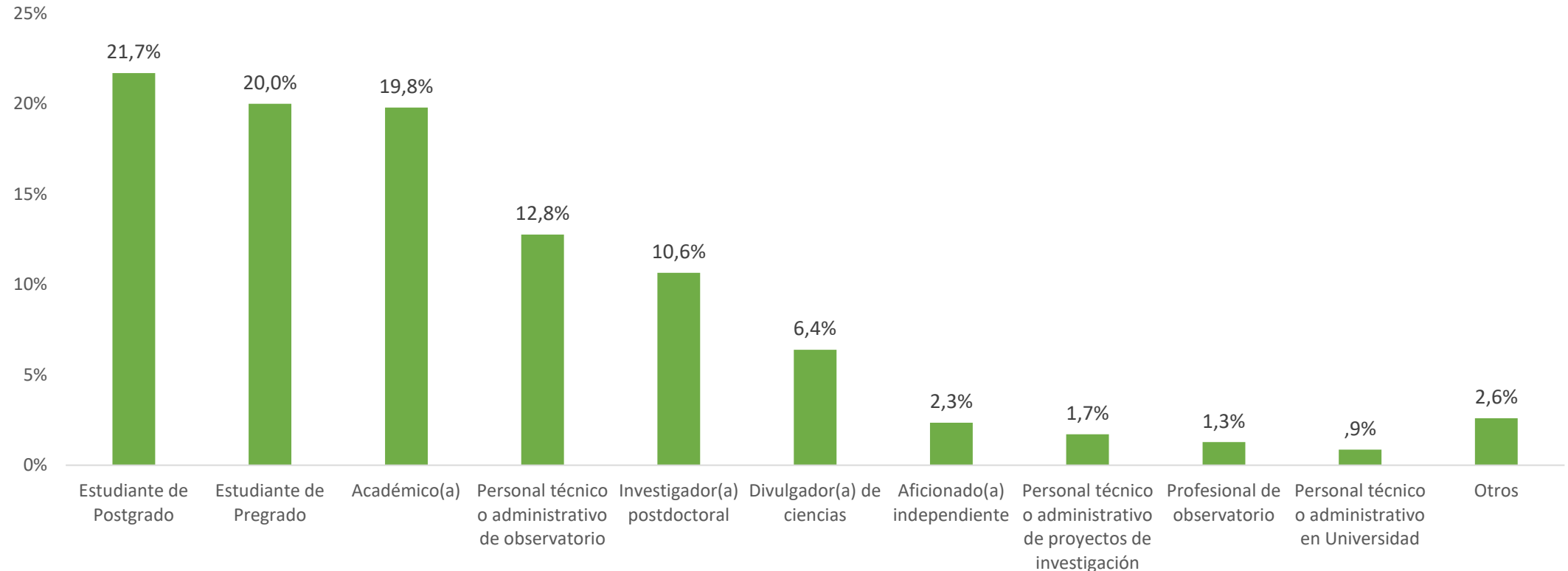
Involvement in the astronomy field



What is your connection to the field of Astronomy?

Most of the respondents (41.7%) are undergraduate and postgraduate students, followed by 19.8% of academics. 10.6% are Postdoc researchers.

Technical or Administrative personnel from Observatories, Research projects and Universities reach 15.4%.

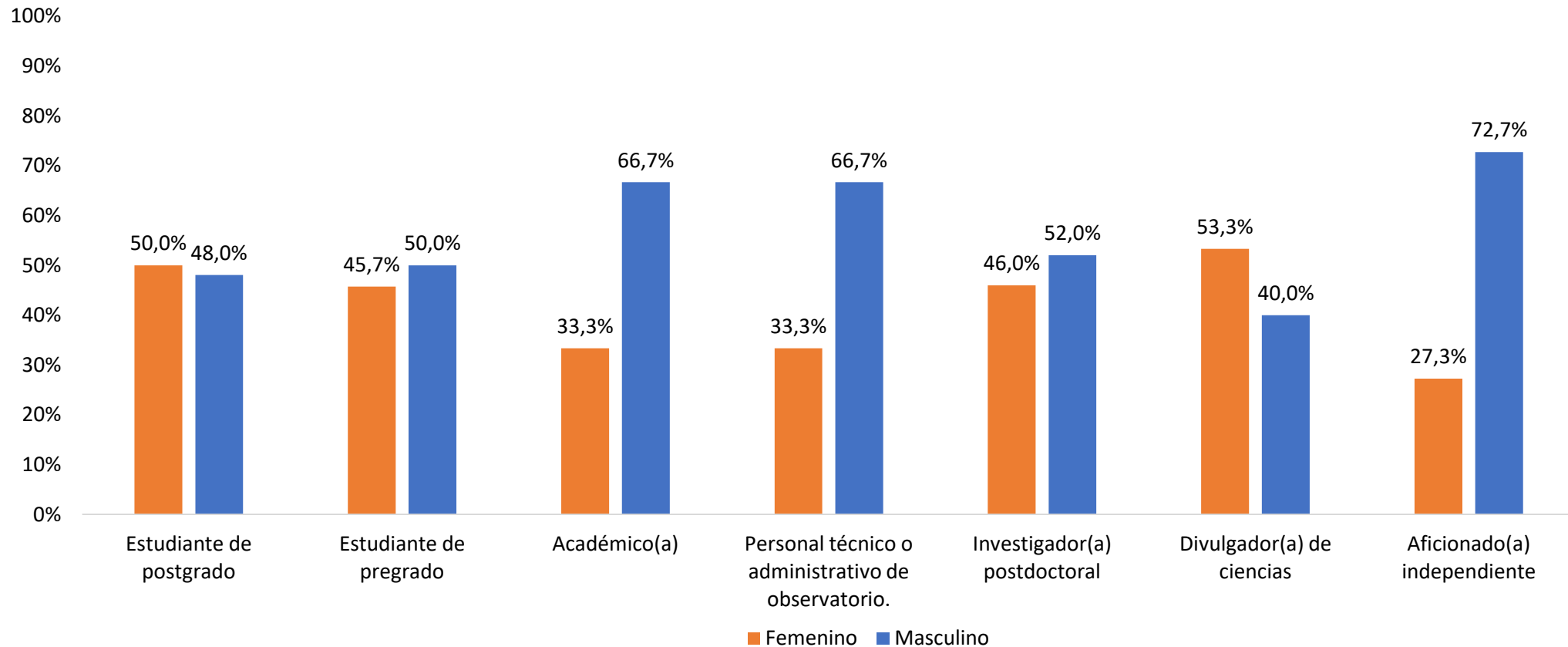


N=470

Involvement in the astronomy field



Involvement based on sex: There is a high balance between men and women in the student environment (taking into account Pre grade, Post grade and postdoc). The main gaps are in the Academic, the Technical or administrative personnel in Observatories and the astronomy enthusiasts environments.



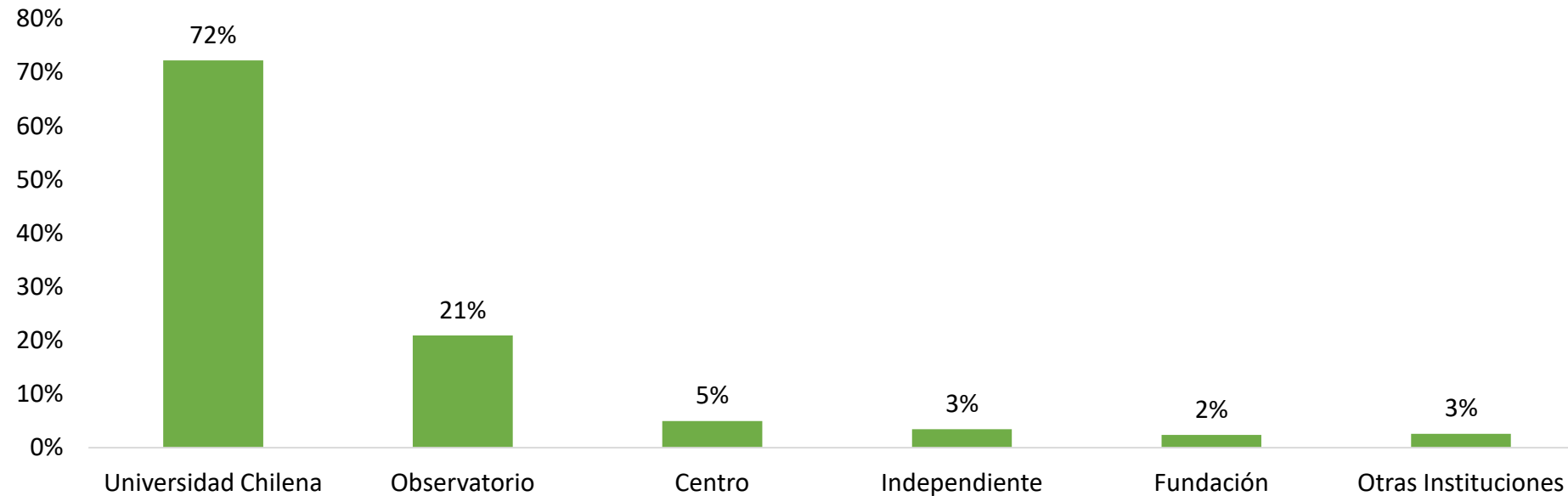
N=470

Involvement in the astronomy field



From what type of institution do you connect in the field of astronomy?

The vast majority of the respondents (72%) are students or workers from Chilean universities, while 21% in Observatories, 5% in Research centers, 2% in Foundation, and a slight percentage in Other Institutions.

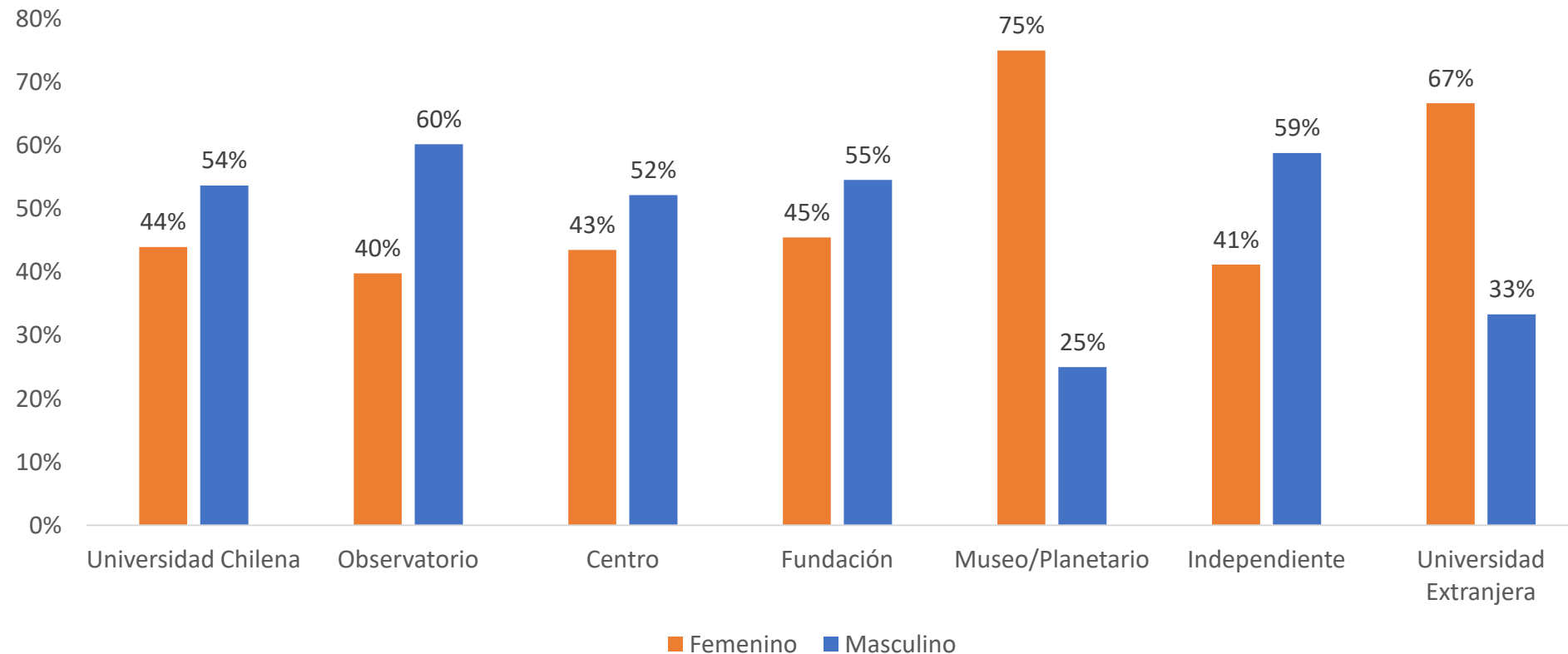


N=470

Involvement in the astronomy field



Type of institution according to sex: stand out that in Chilean universities, Observatories, Centers, Foundations and Independents there is a higher proportion of men, contrary to foreign universities and Museum/Planetarium, where women are predominant. **Women are strongly associated to science outreach.**

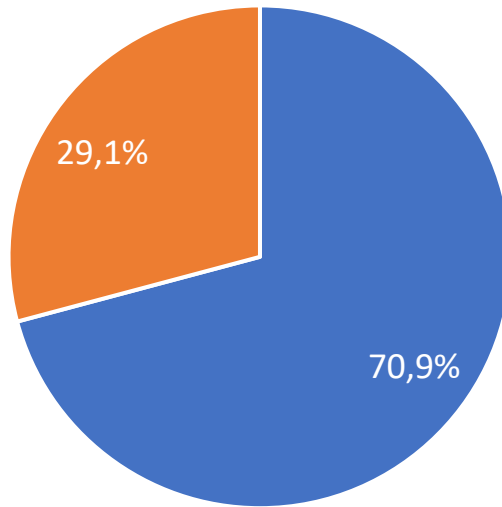


N=470

SOCHIAS affiliation/SOCHIAS membership

Are you currently a member of SOCHIAS?

From the respondents (n=470) only 29.1% are current members of SOCHIAS, while the rest are not.

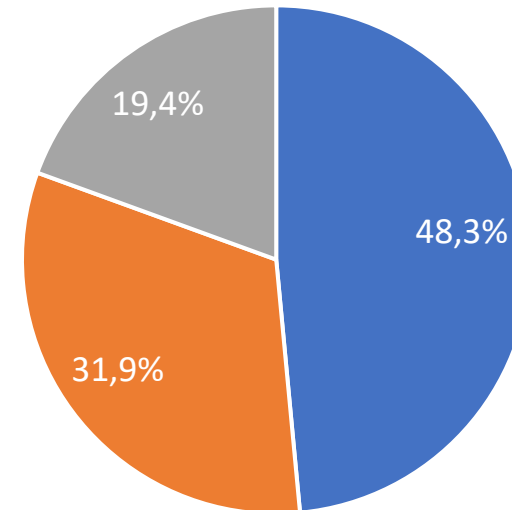


■ No ■ Sí

Are you in the White-list of SOCHIAS?

(*Access to the Chilean observation time).

From the respondents (n=470) 31.1% are on the white-list, while nearly half (48.3%) are not. 19.4% do not know.

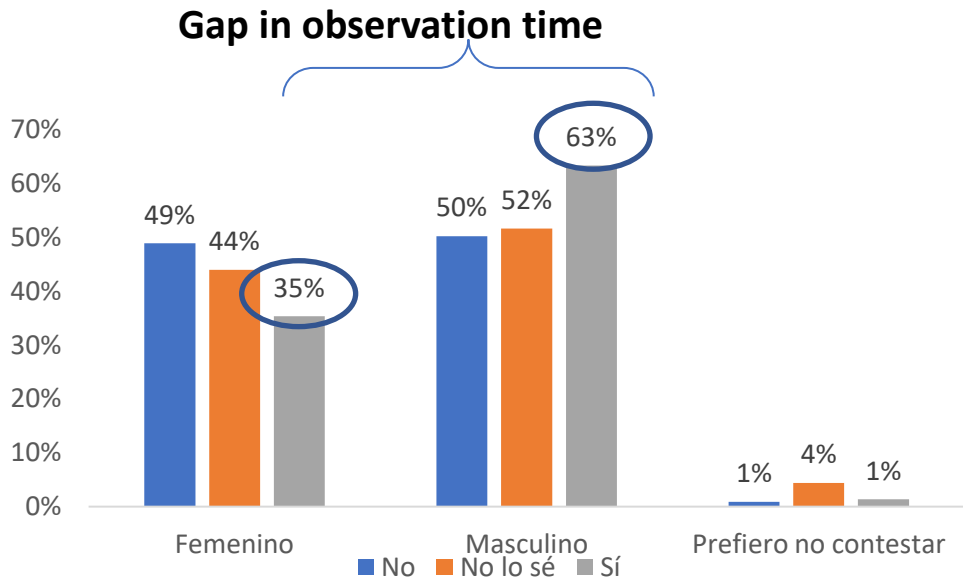


■ No ■ Sí ■ No lo sé

SOCHIAS membership

Are you in the White-list of SOCHIAS? (*Access to the Chilean observation time).

With regards to sex, men have greater presence on the white-list of SOCHIAS, almost twice than that of women (63% versus 35%). This is due to the fact that **the group with the highest observation time is the Academic, where the presence of men is much higher.**



		% Vertical	% Horizontal	
		Total	Female	Male
Academic	No	17%	50%	50%
	Do not know	1%	100%	0%
	Yes	82%	29%	71%
Post grade student	No	18%	56%	44%
	Do not know	40%	51%	46%
	Yes	41%	45%	52%
Post Doc and No Researcher	No	31%	56%	44%
	Do not know	12%	50%	50%
	Yes	57%	38%	59%

2nd SOCHIAS CENSUS REPORT PERCEPTION SURVEY



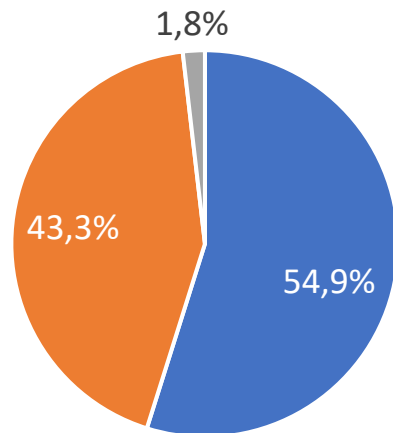
CHARACTERIZATION OF THE COMMUNITY (ACCORDING TO RESPONDENTS FROM THE SECOND SURVEY)



Characterization

SEX

Of all respondents (n=385) 54.9% are male sex, and 43.3% are female sex. 1.8% prefer not to answer. This result reveals an equal trend between these categories.

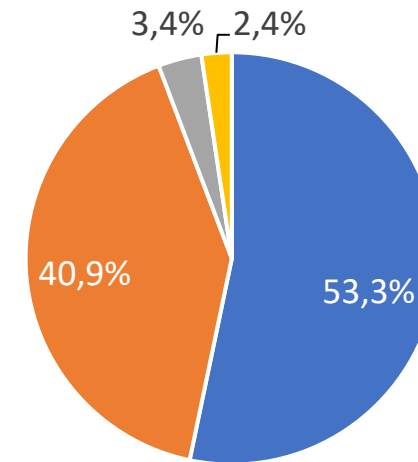


■ Masculino ■ Femenino ■ Prefiero no contestar

N=385

GENDER IDENTITY

With regard to gender identity, 94.2% self-identify with usual categories of men (53.3%) or women (40.9%). For the “Non binary” category 3.4% self-identify to it. Despite the lower percentage, in order to validate the gender diversity within the community, it's important to include this variable.

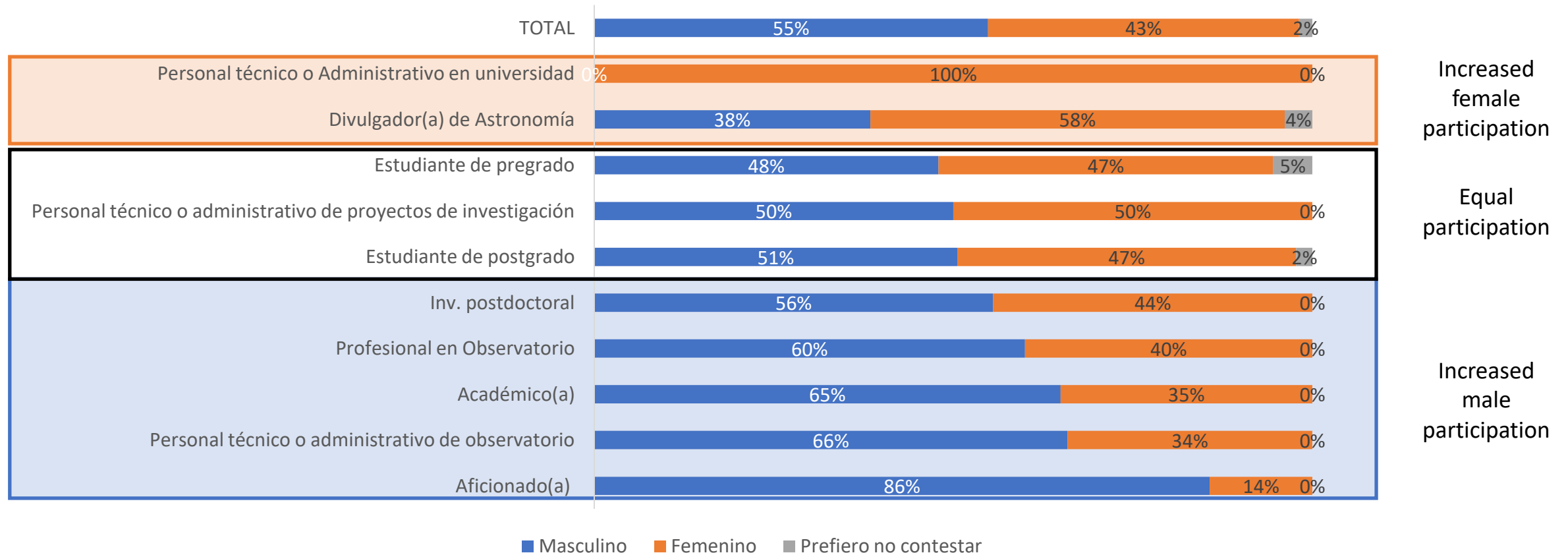


■ Hombre ■ Mujer ■ No binario ■ Prefiero no contestar

N=385

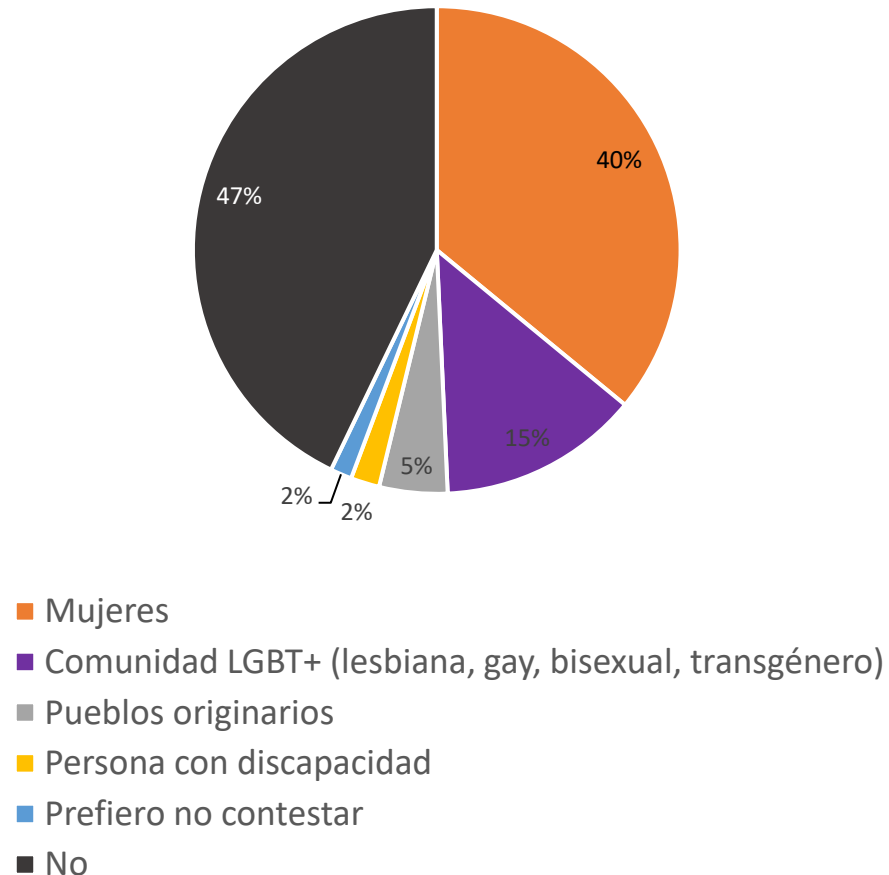
Involvement in the Astronomy Field

Participation based on Sex: there is slightly higher male participation in the astronomy field than women. The category where men' participation is notably higher compared to women are the enthusiastic, the technical personnel from observatories, and the academics. By contrast, women are predominant in the technical personnel from universities and between scientific outreach. On technical or administrative personnel from research projects, and pre and post grade students the involvement is equal between men and women.



Perception about belonging to underrepresented groups within the scientific community

Would you say that you belong to some of the following groups considered as underrepresented within the scientific community? (multiple)



N=385

Within the SOCHIAS community, there is less identification with some underrepresented groups compared to the general population, but in other cases is higher. Among the groups in which there is lower representation are women with 40% in SOCHIAS (vs. 51% of the general population, Indigenous people with 5% of identification (vs. 12,8%), and disabled people with 2% (vs. 5.8% mild or moderate disability, and 7.2% severe) On the contrary, the group with the higher representation is the LGBT+ community with 15% vs. 8% present in society – according to the IPSOS survey, 2023.

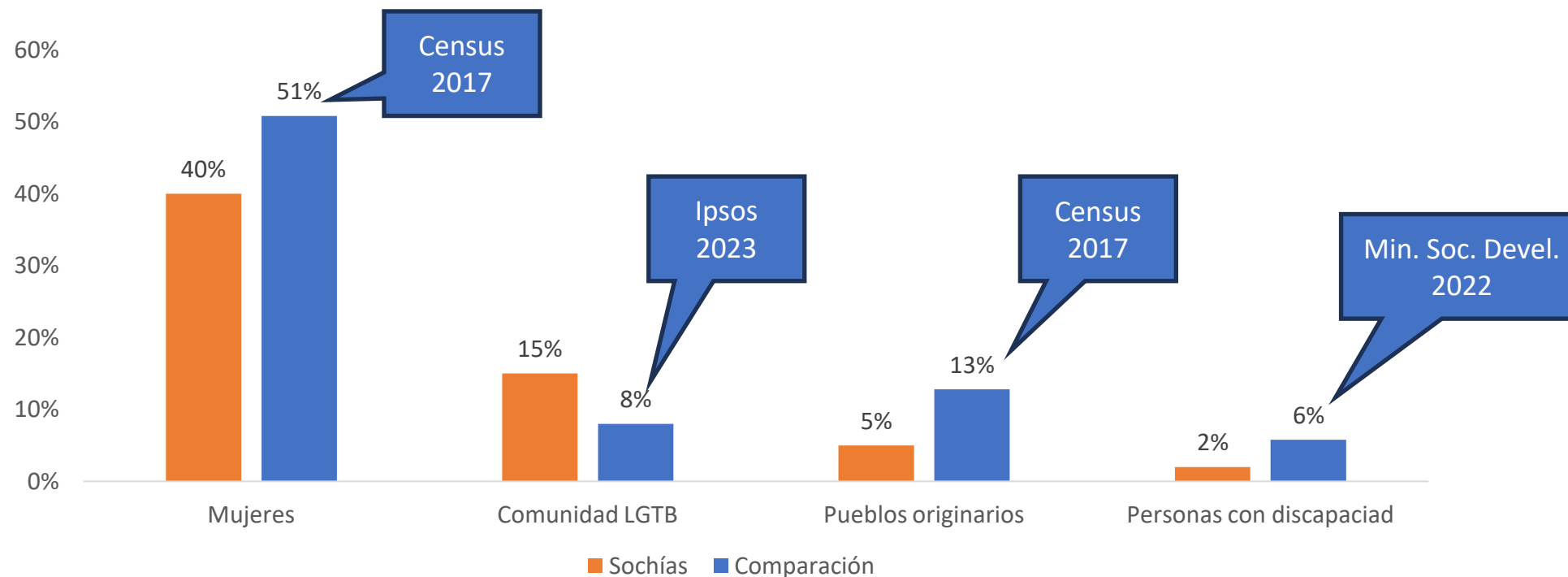
Census 2017: 12.8% of the Chilean population state belonging to a indigenous tribe..

IPSOS 2023: 8% of the Chilean population self-idenfiy with the LGBT+ community.

Own elaboration based on Ministry of Social Development 2022: In Chile, 5.8% of people between 18-60 years old are in mild or moderate disability.

Perception about belonging to underrepresented groups within the scientific community vs Different parameters.

Would you say that you belong to any of the following underrepresented groups within the scientific community?
(multiple)



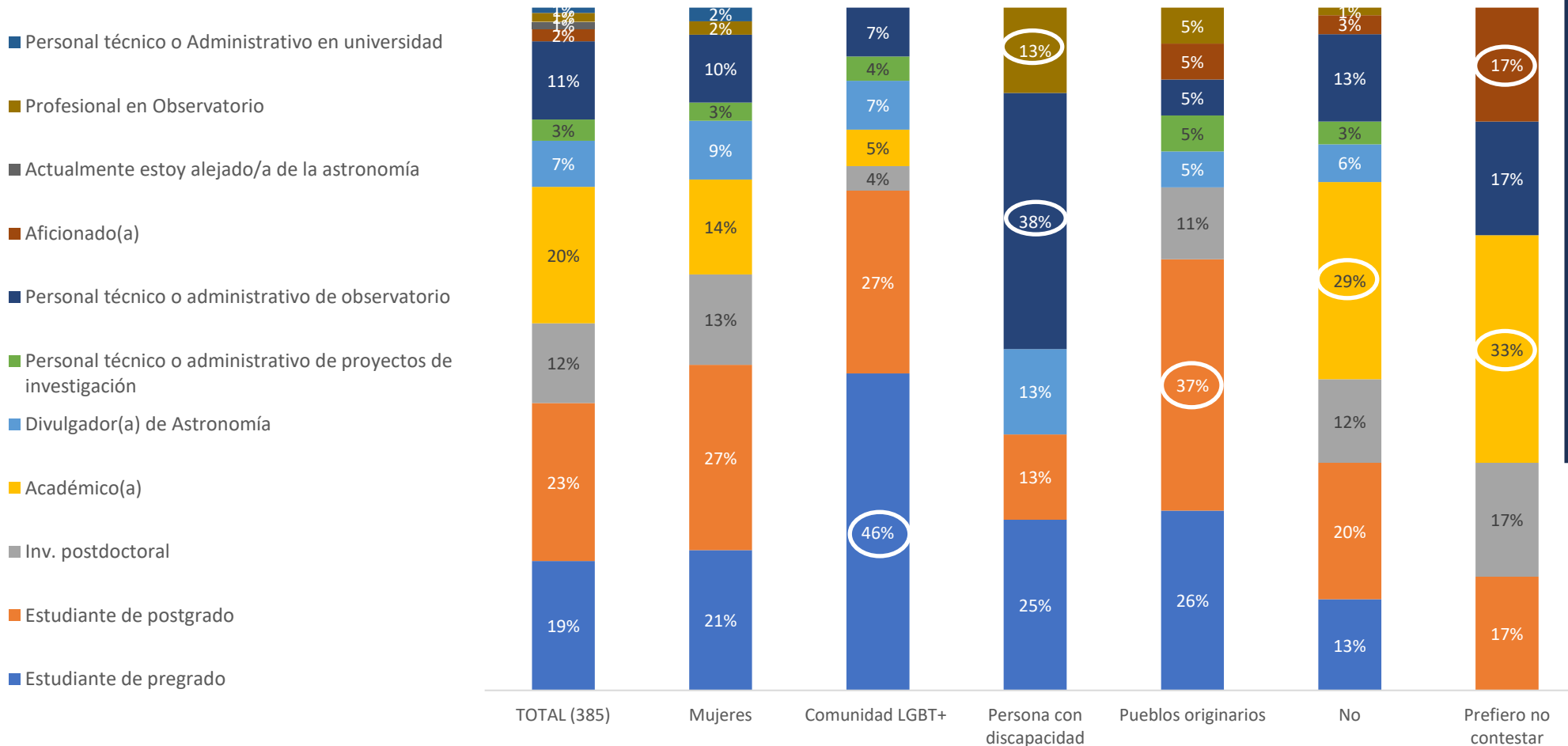
Census 2017: 12.8% of the Chilean population state belonging to a indigenous tribe, a 50.8% are women.

IPSOS 2023: 8% of the Chilean population self-identify with the LGBT+ community.

Own elaboration based on Ministry of Social Development 2022: In Chile, 5.8% of people between 18-60 years old are in mild or moderate disability.

Perception of underrepresented groups within the scientific community

Would you say that you belong to any of the following underrepresented groups within the scientific community?
(multiple)

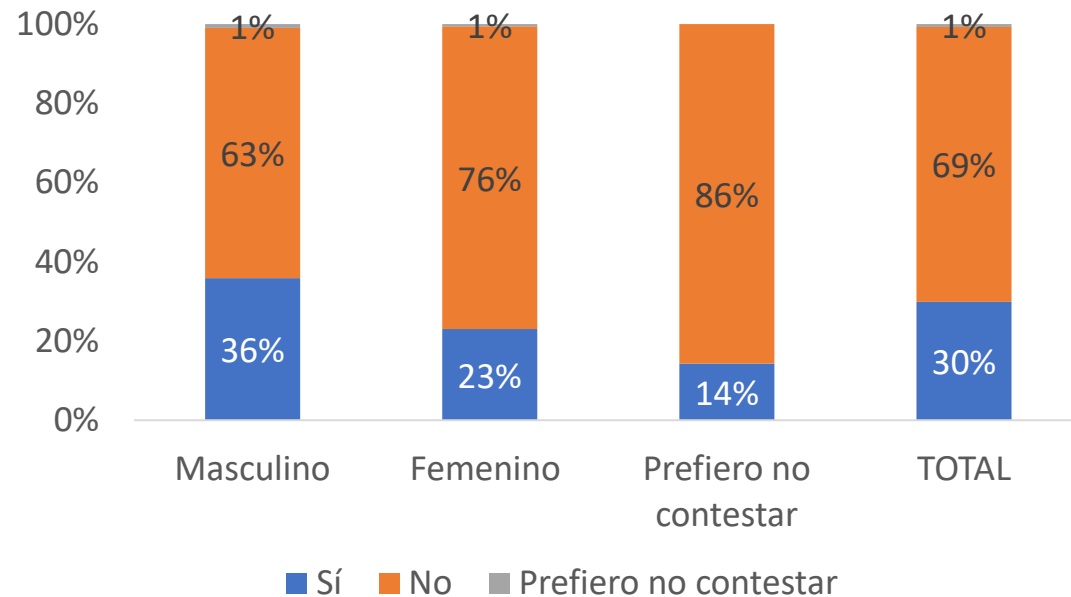


Among people who self-identify with the LGBT+ community, 46% are undergraduate students. Those who self-identify with an indigenous tribe are postgraduate students. For disability, the administrative and professional staff from Observatories are the prominent one.

Academics are predominant in those groups of people who do not feel they belong to any underrepresented group or who prefer not to answer.

Situation of Care in the astronomical community.

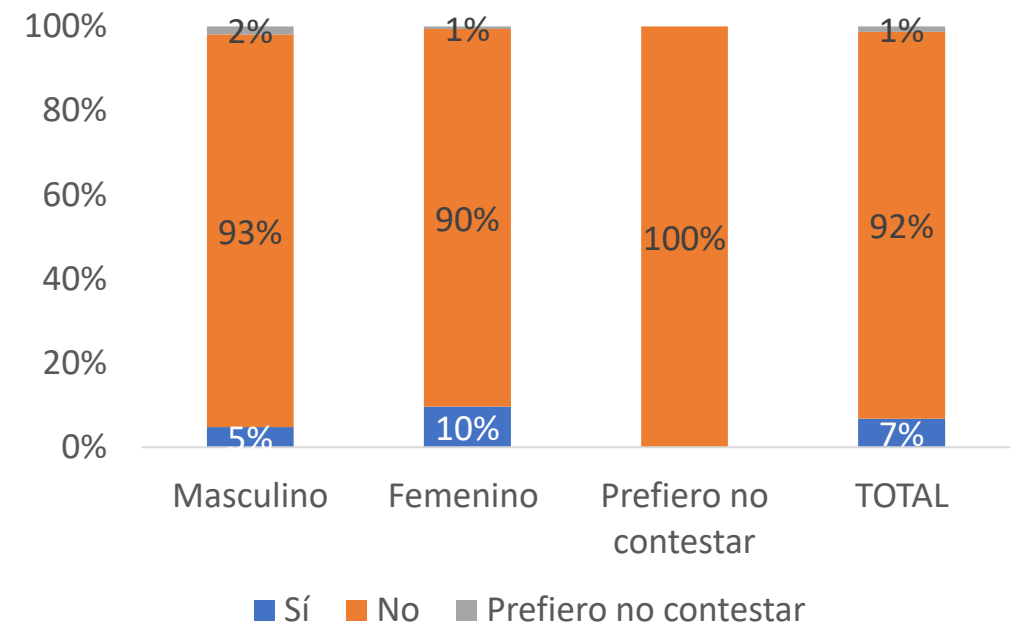
Have children or minor(s) in care



N=385

69% from the astronomical community do not have children in care, however, men appear to have more children than women in 13 places. This indicates a delay or denial of maternity, as will be seen in the next slide.

Have sick relatives in care

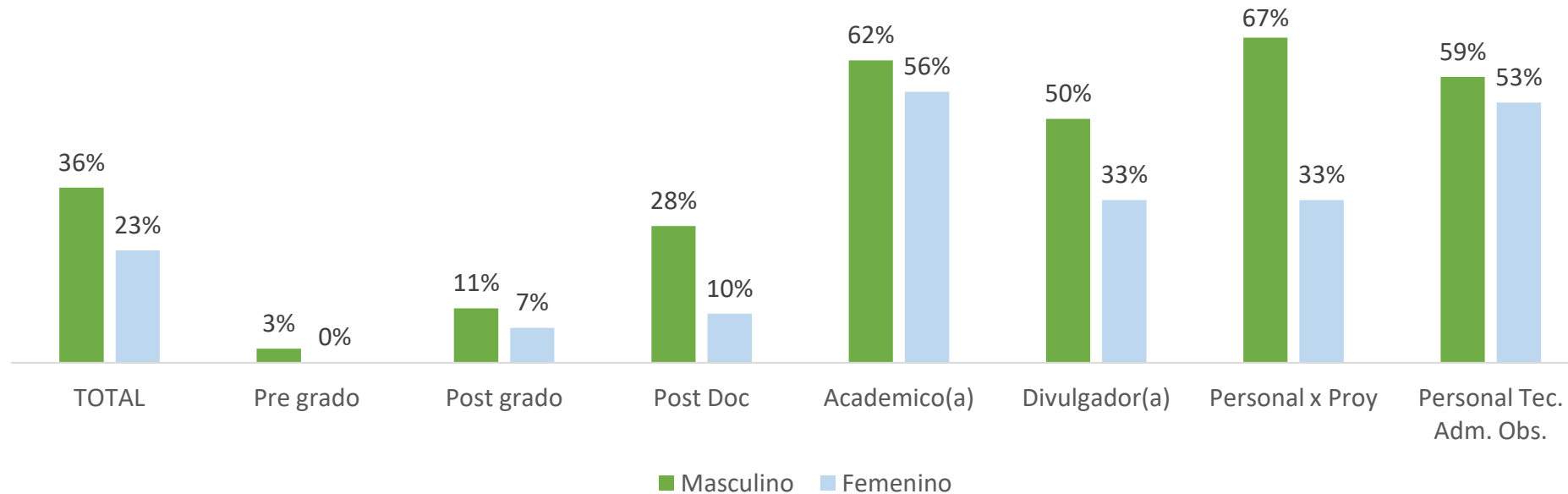


N=385

Women are twice as likely to be caretakers versus men, despite the percentage of respondents indicating that they are not caretakers.

Situation of Care in the astronomical community. Having children in care

**% that DO have children or minor in care,
according to the relationship with SOCHIAS**

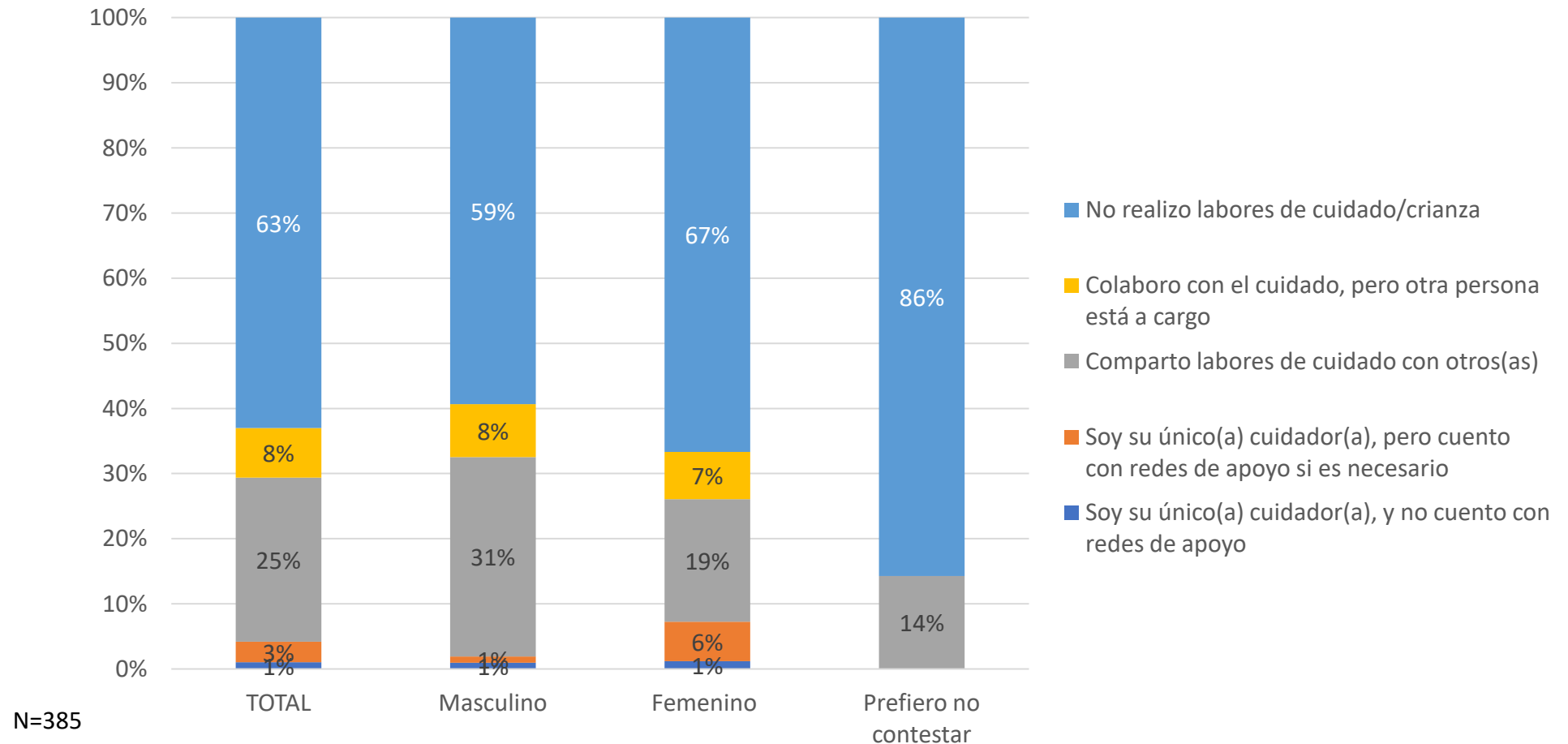


Independent of the relationship with SOCHIAS, more men have children in their care than women, which confirms that women from the SOCHIAS community postpone or decide against motherhood compared to men.

Situation of Care in the astronomical community.

In regard to care and parenting tasks of children or relatives

While most of them do not perform care tasks, men appear to share care to a greater extent than women, who report that they are the “only” carers, but they have support networks in case of need.



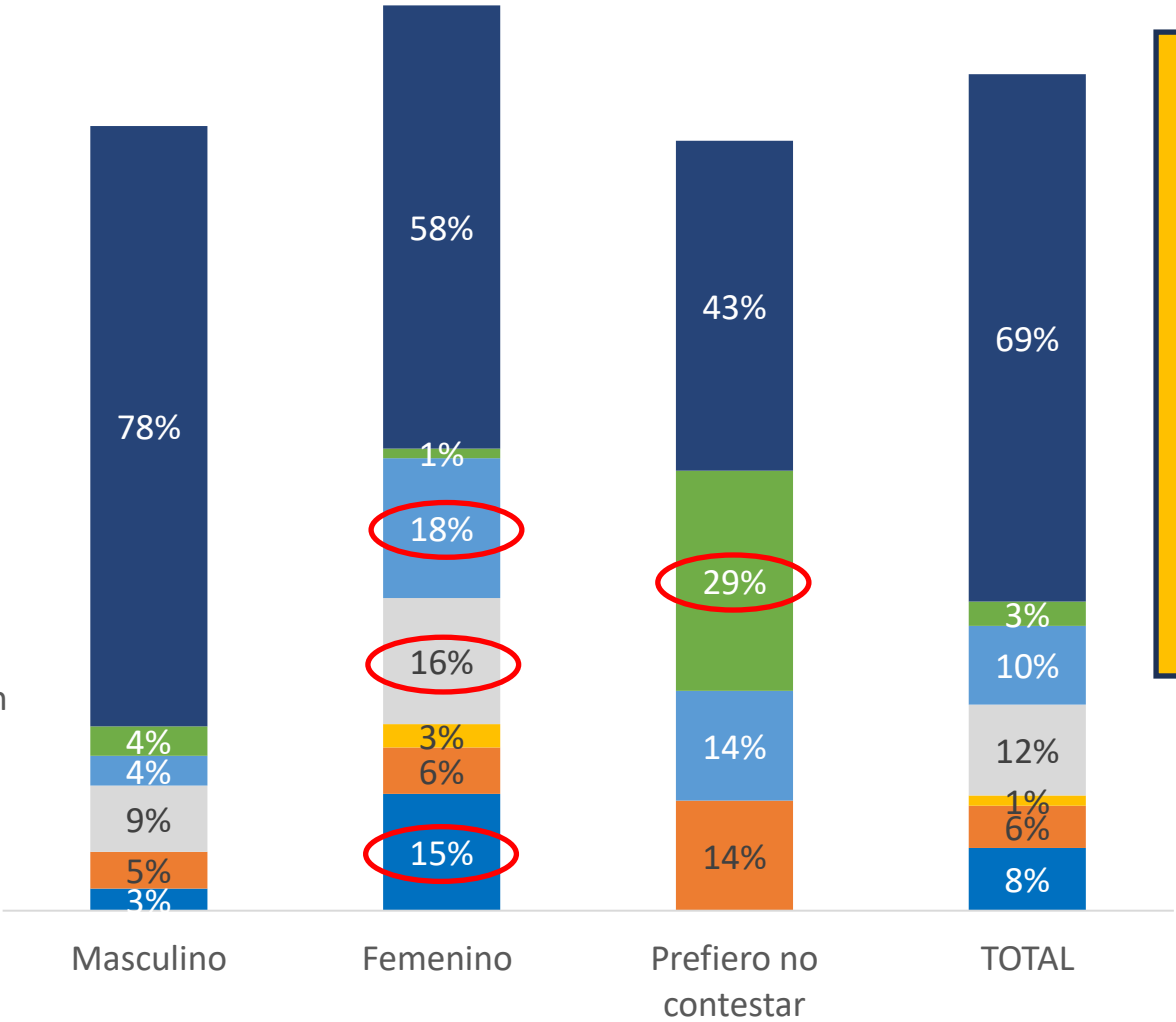
LABOUR ENVIRONMENT



Perception about labour environment

Have you experienced some of the following situations?

- Ninguna de las anteriores
- Prefiero no contestar
- He recibido hostigamiento sexual
- He recibido hostigamiento laboral
- He tenido que ocultarme para dar pecho a mi bebé
- No he tenido derecho a Sala Cuna en mi lugar de trabajo
- Me han preguntado si voy a tener hijos(as) en una entrevista laboral



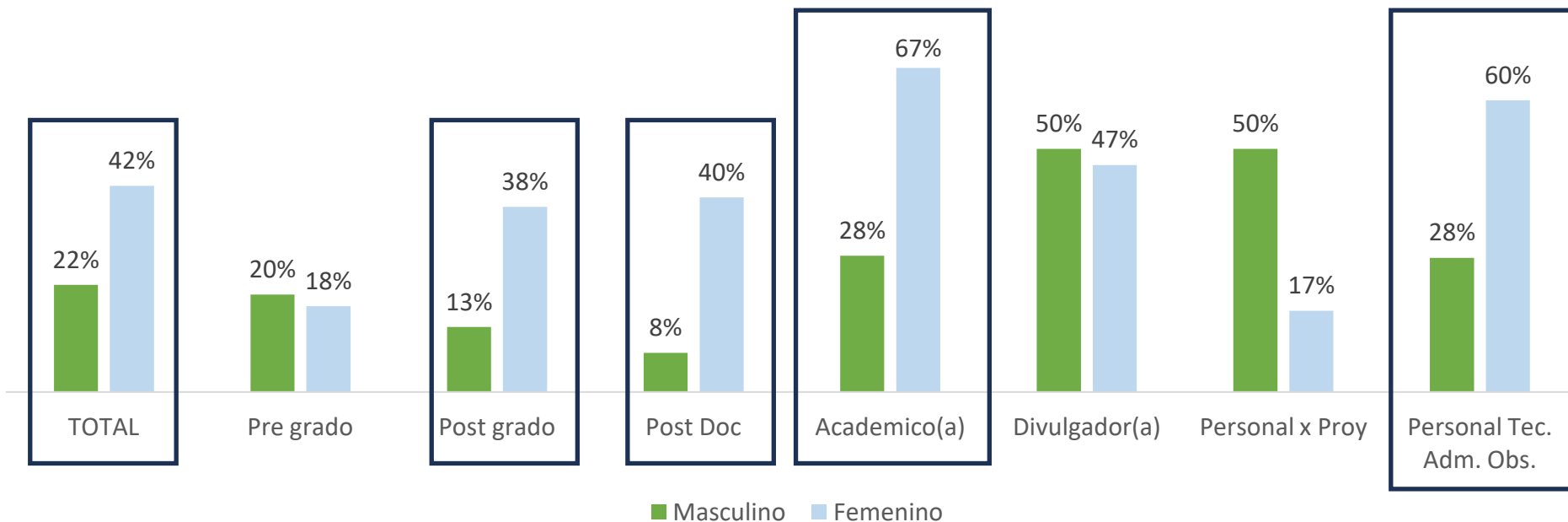
The differences are evident. While 22% of men state having experienced some of these situations of discrimination or aggression, this percentage reach 42% in women, where sexual harassment (18%), labour harassment (16%), and questions about the projection of children in labour interviews are highlighted. People who prefer not to disclose their sex report “sexual harassment”(14%).

Outreach (% of people who have experienced situations):	22%	42%	57%	31%
Intensity (average number of mentions):	1,0	1,2	1,0	1,1

Perception about labour environment

Have you experienced some of the following situations?

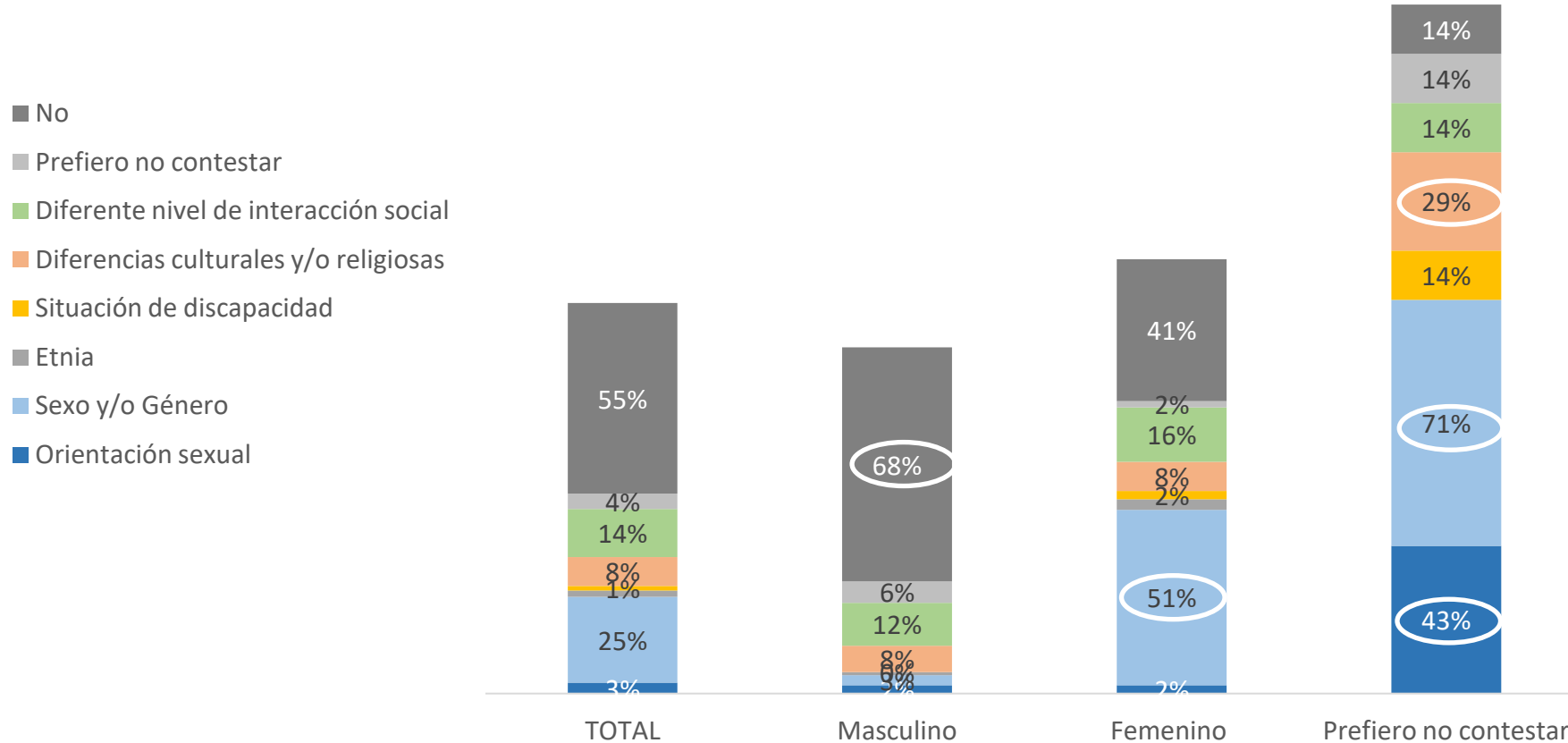
% of people mentioning that they have experienced at least 1 situation according to Role



Women were more likely to report situations related to discrimination or harassment in their work or study places. The gap among academics, post grade and postdoc student are highlighted.

Perception about labour environment

Do you consider that you have been discriminated for any of the following reasons?



Men have reported feeling less discrimination.

In general, the main reason of discrimination is related to Sex/Gender which affects women and those who do not want to answer because of their sex.

In the same way, for those who do not disclose their sex, they experience other types of discrimination, such as that based on sexual orientation or cultural differences.

N=385
There are other categories with a smaller %: nationality, being a student (professional or academic status), motherhood, age, socioeconomic status, body shape (obesity), political affiliation.

Outreach (% of people who have felt discrimination):	45%	32%	59%	86%
Intensity (average number of mentions)	1,52	1,36	1,58	2,33

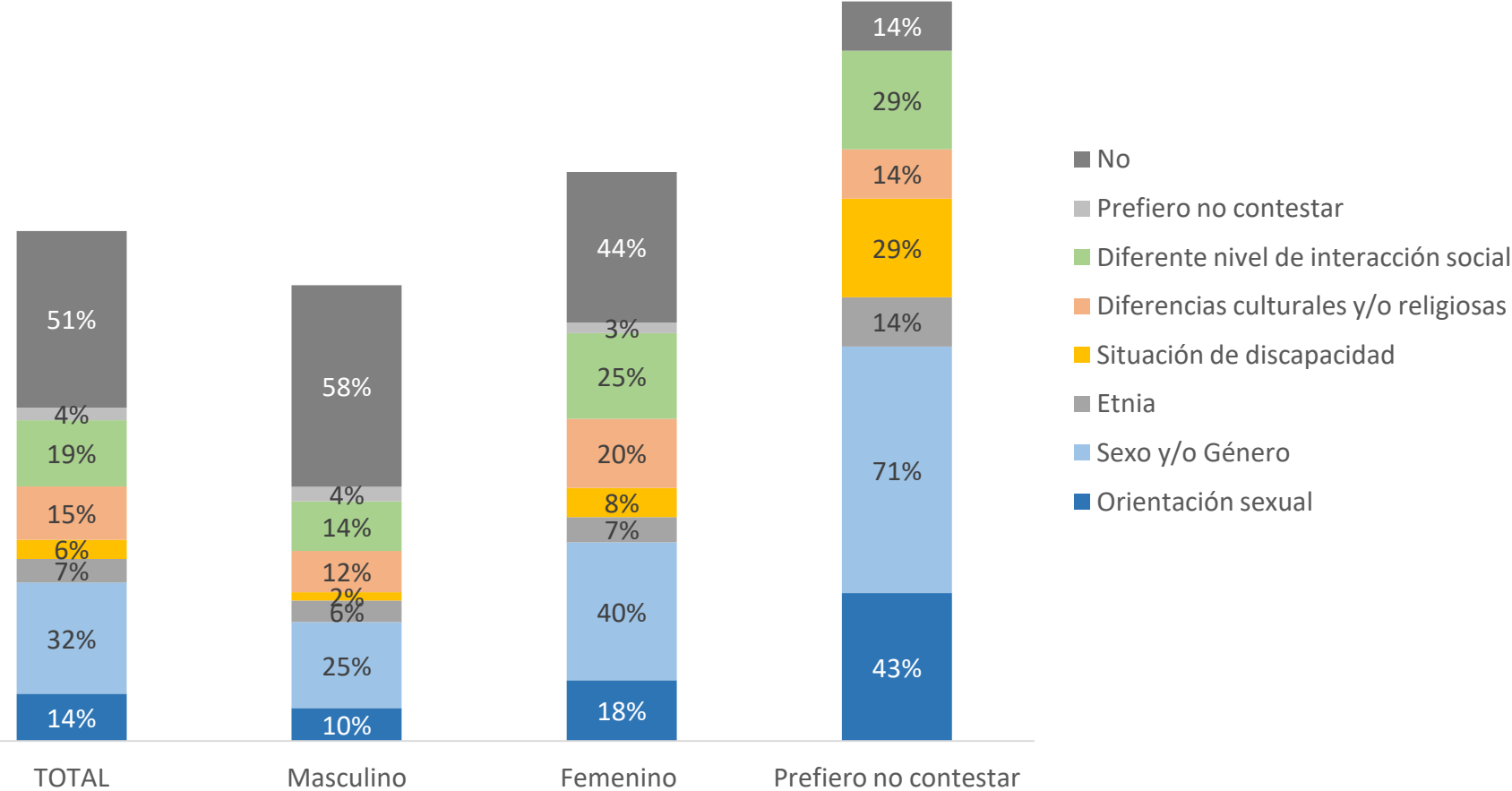
Perception about labour environment



Have you perceived that someone from your labour environment has been discriminated for any of following reasons?

Likewise the personal perception of situations, the main reasons for discrimination in the labour environment are sex/gender (32% total) and different level of social interaction (19%). It is interesting that people who prefer not to disclose their sex and, in a lower extent, women, emphasize these reasons and also the situation of disability.

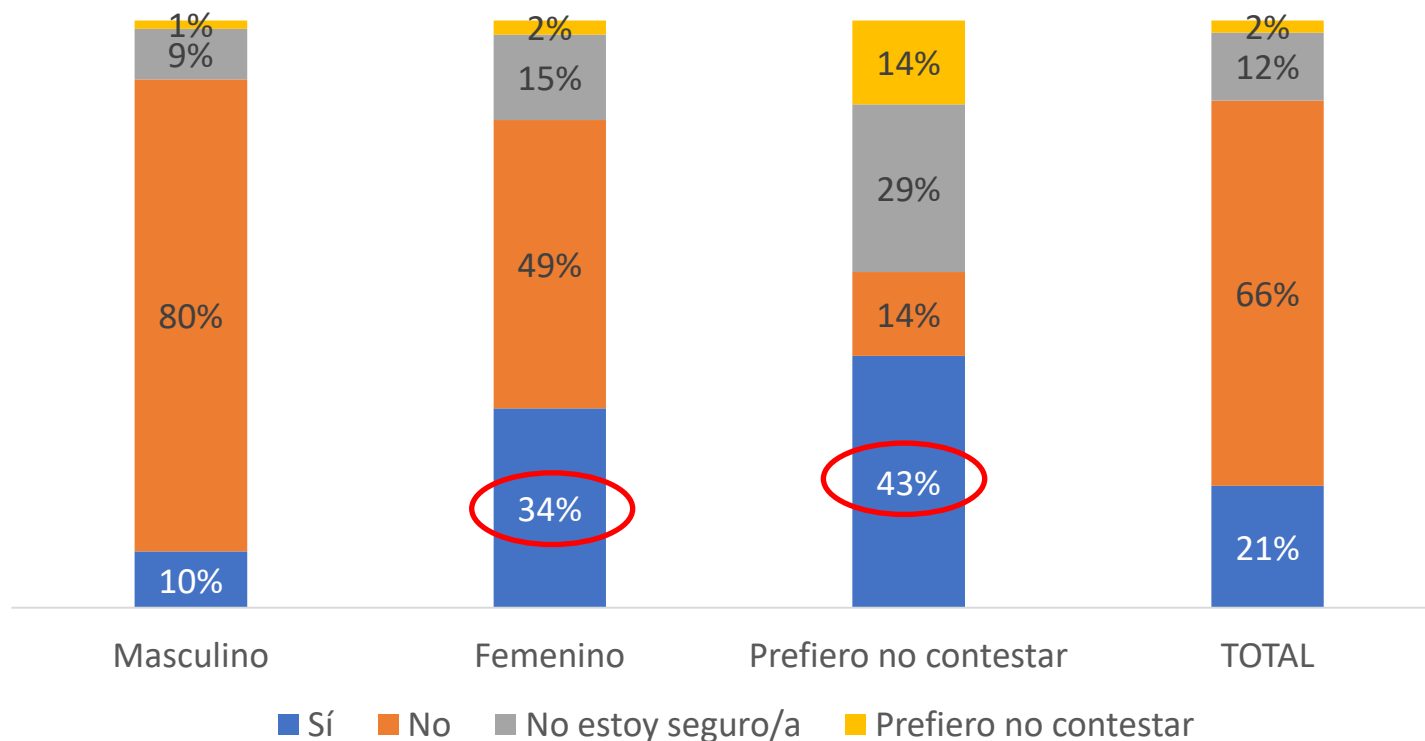
The difference on the perception may be related to the normalization of certain behavior that may be happening in the labour environment.



Outreach (% of people who have felt discrimination):	49%	42%	56%	86%
Intensity (average number of mentions):	1.53	1.37	1.71	2,.14

Perception about labour environment

Have you felt attacked by the reasons you expressed in the previous question? (physically or psychologically)



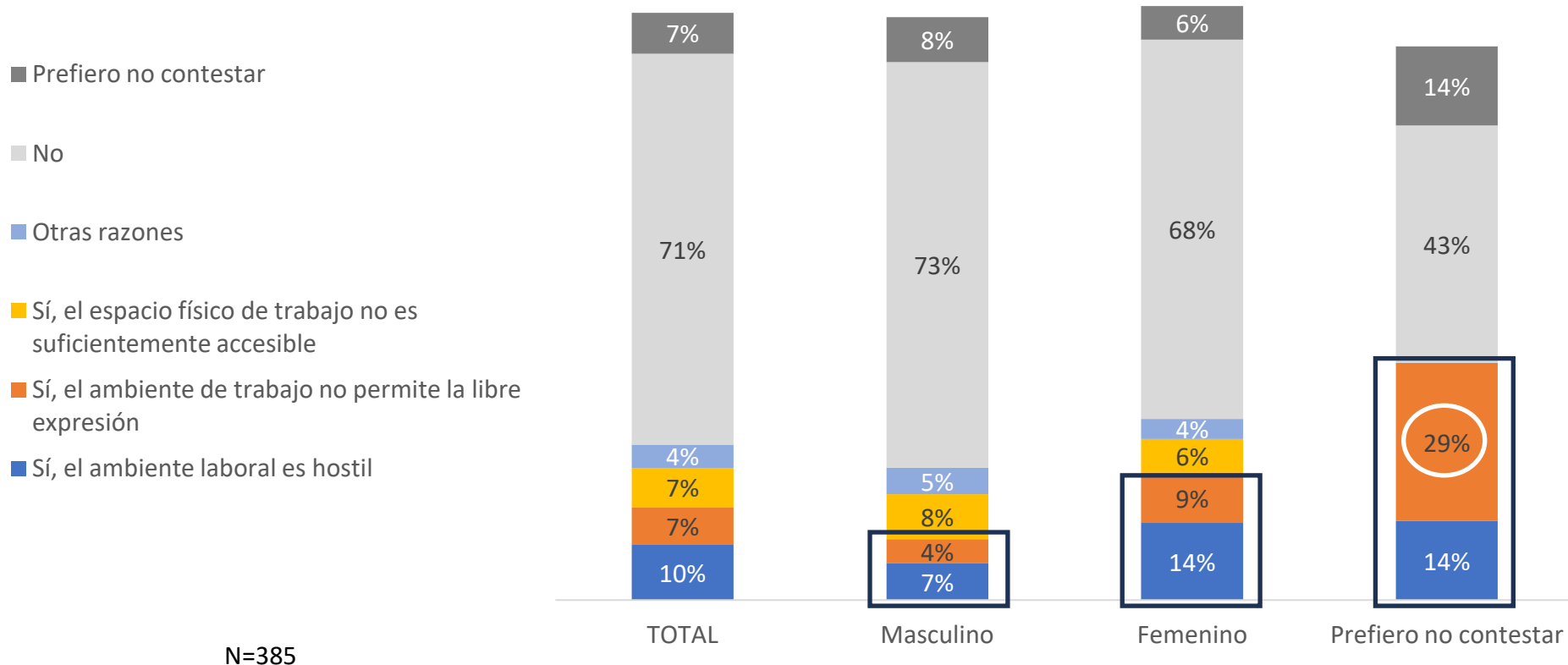
N=385

Discrimination can be felt as aggression. 43% of the people who prefer not to disclose their sex, state they have felt attacked by the aforementioned discrimination's reasons. On the other side, 34% of women have reported the same.

Perception about labour environment



Do you consider that there is any inherent condition to the environment by which your work or study is difficult?



While the majority (almost 80%) state no existence of any condition in the environment that impede in their job/study, 29% of the people that did not disclose their sex note that the labour environment does not allow free expression. On its part, more women consider the work environment more hostile and that it does not allow them to express themselves freely, about 23% in women and 11% in men.

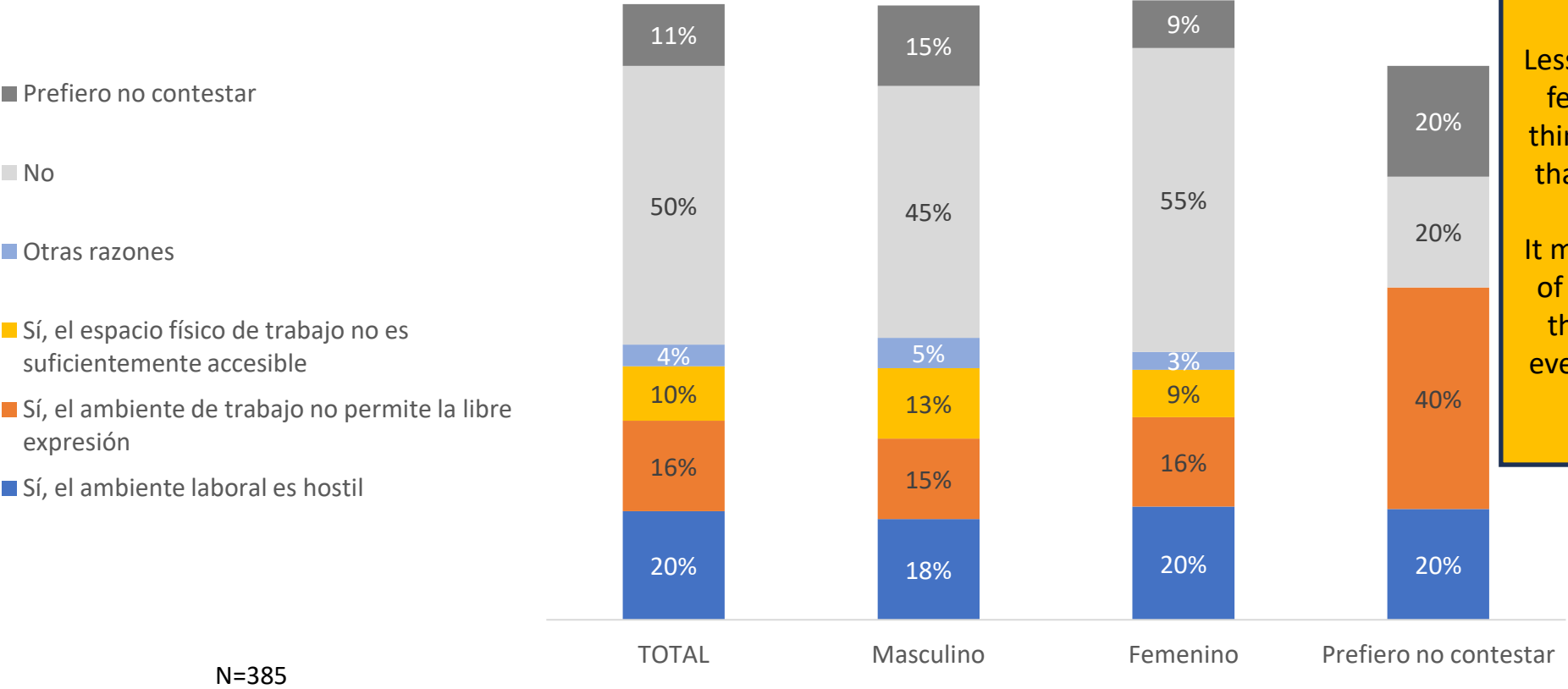
Outreach % of people who consider difficult's situation: 22% 19% 25% 43%

Perception about labour environment among those who have felt discrimination



Do you consider that there is any inherent condition to the environment by which your work or study is difficult?

Do you consider that you have been discriminated by any of the following reasons?



Less than half of people who HAVE felt situations of discrimination think that there is some condition that negatively affect their job or study.

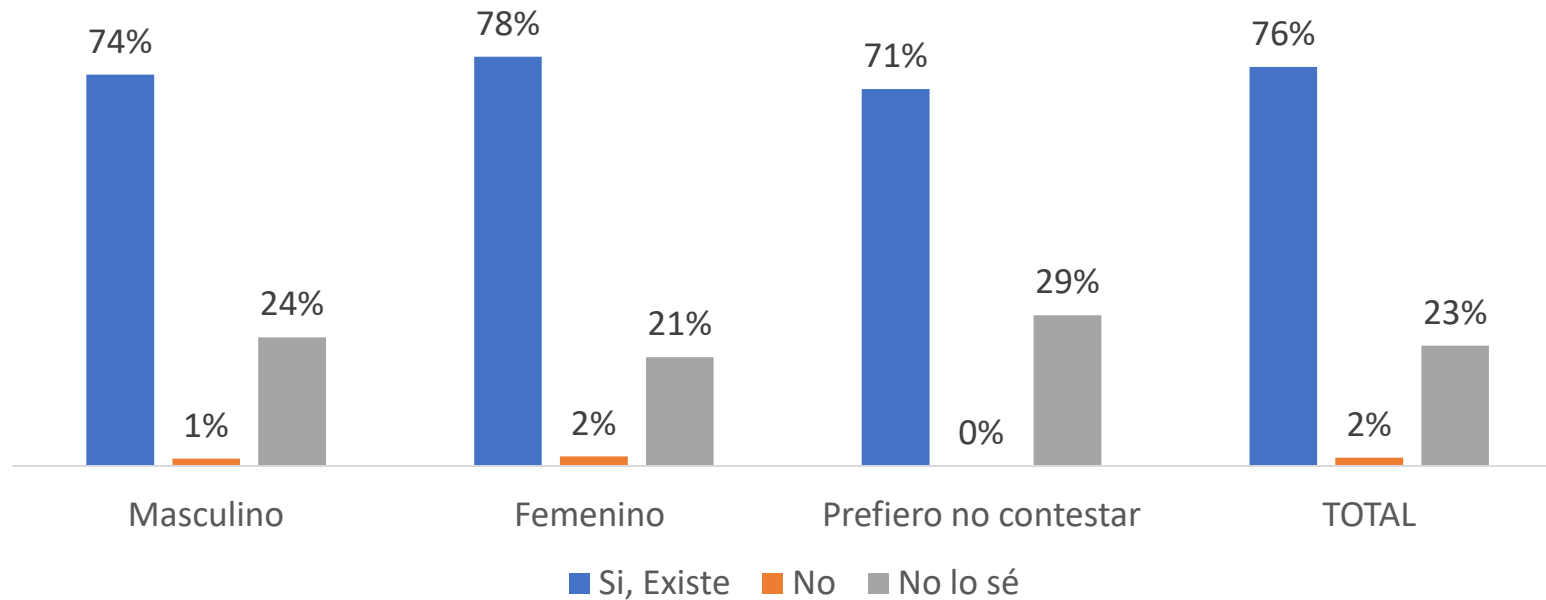
It may be due to the normalization of situations experienced or that they are considered as isolated events that would have no reason to be repeated.

Outreach % of people who consider situation of difficulty:	39%	40%	36%	60%
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Existence of whistleblowing protocols



Does your institution/university have protocols to follow to report cases of discrimination, harassment and/or bullying?



A general awareness of knowledge about the existence of protocols for discrimination, harassment and/or bullying in their institutions is observed. According to the survey of Conciliation and gender equality, this indicator is over the national level.

REACTIVE CONSULTORES 2021: Conciliation and gender equality study; 70% of the workers state that their organization have regulations or document on matters of prevention and sanctions of sexual/labour harassment.

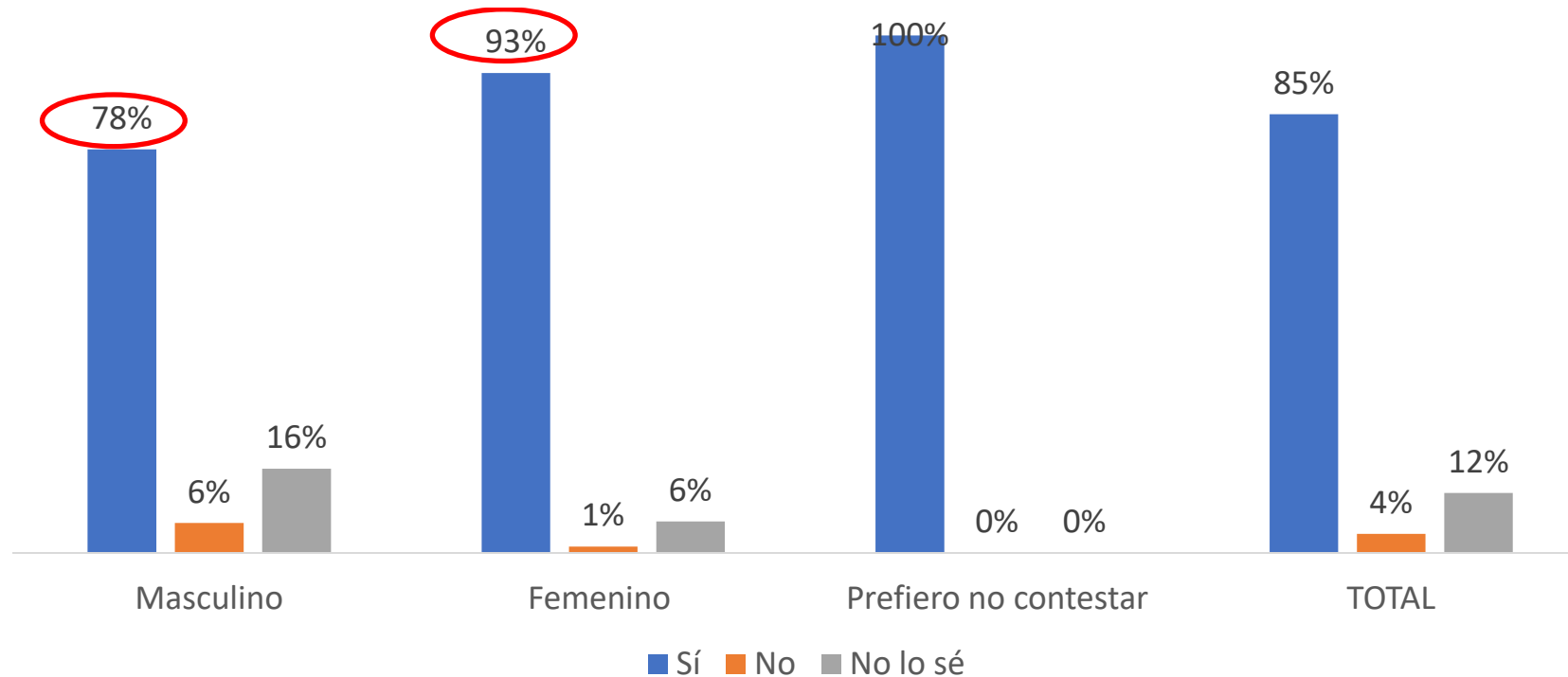
NEEDS AND SOLUTIONS FOR A BETTER OUTCOME



Need for training of the astronomical community



Do you think that training for the astronomical community is necessary to reduce possible causes of discrimination?

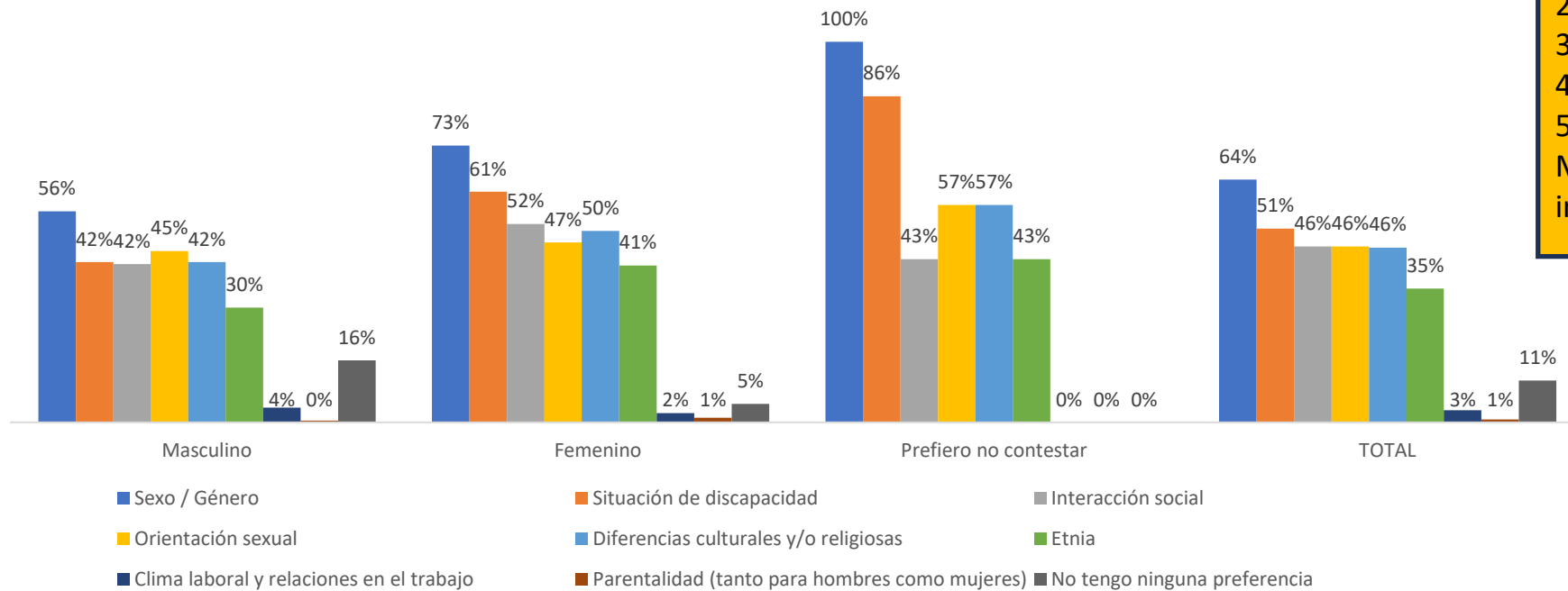


Although training is considered necessary, this data reveals that in the group of men this opinion decreases, showing greater resistance.

Most relevant topics for a training



Indicate the topics that seem most relevant to you for possible training (you can select more than one):



The main relevant topics for a training are:

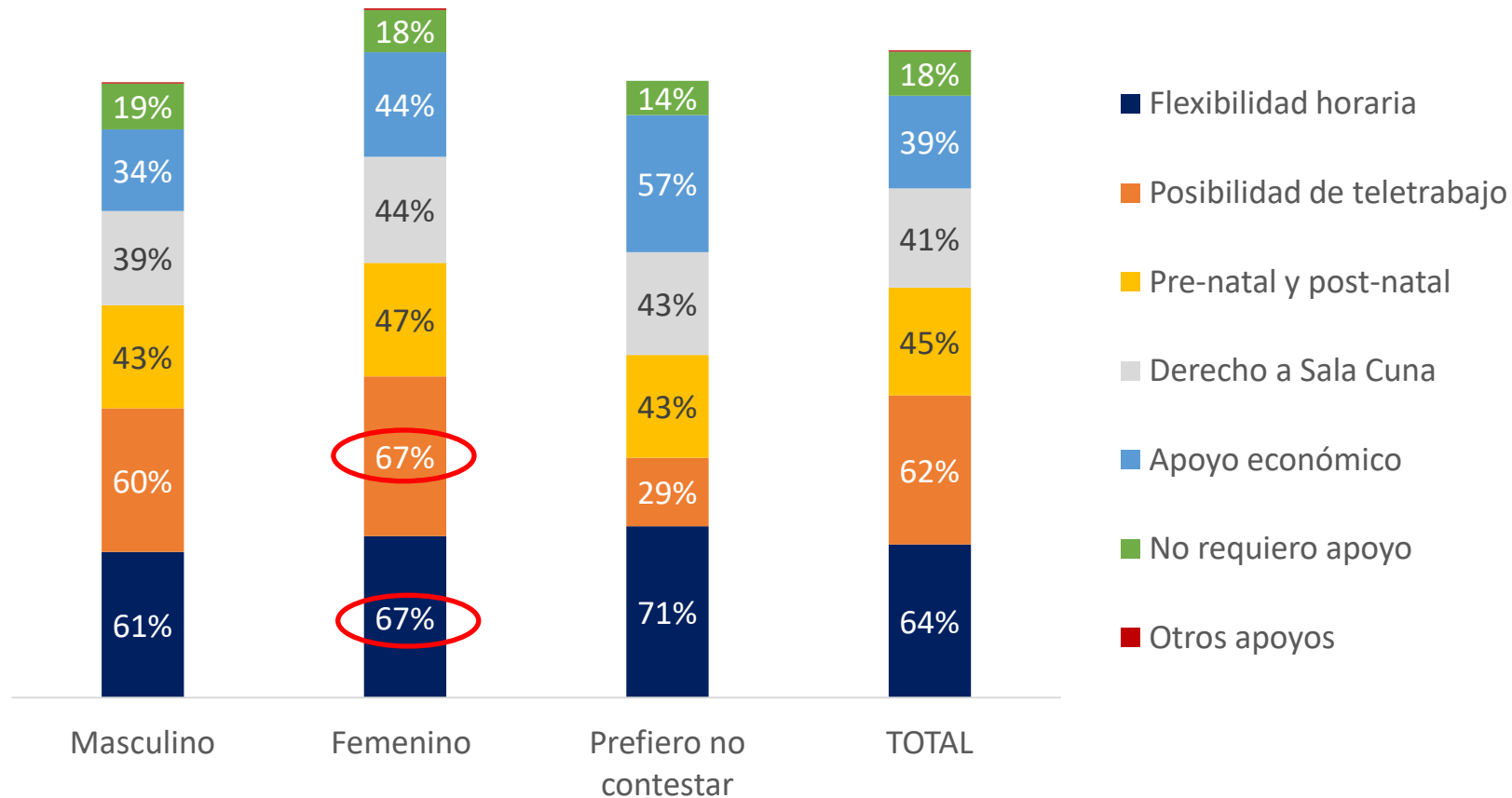
1. Sex/gender
2. Disability status
3. Sexual orientation
4. Cultural/ethnicity differences
5. Social interaction

Most of the half of people are interested in the first 2 topics.

Possible solutions to situations to promote Conciliation



Personal and family life: What support measures could the institutions take?

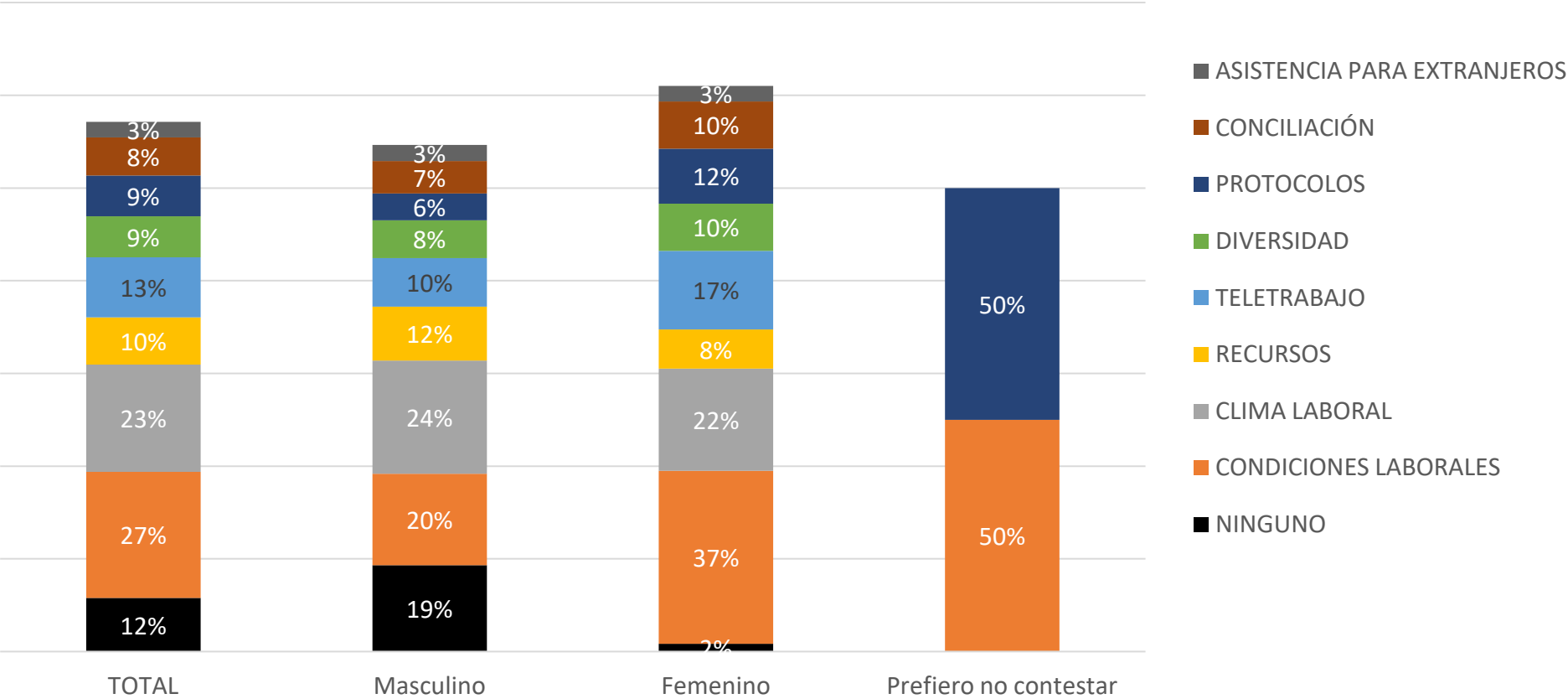


While teleworking and flexible working hours are denoted by the majority, women and those who did not want to disclose their sex are emphasized. These measures are key for a greater compatibility with care tasks.

Needs for a better labour performance



Tell us more details about what you would need for a better performance at your job:



Men were less likely than women to consider improvements of work conditions as necessary for their job performance. Better labour conditions, labour environment, Resources and Teleworking are the main needs for a better labour performance. While women prefer more labour conditions, men prefer as conditions as labour environment.

Needs for a better labour performance



LABOUR CONDITIONS

Being protected under a employment agreement during a postdoc, being a contract worker is undignified.

Post Doc. researcher, man.

Increase the number of research job vacancies in Chile and their duration (more than 3 years), in order to decreasing the uncertainty on the future labour in the field.

Post Doc. researcher, woman.

A consistent salary with cost of life from the workplace.

Academic, man.

The scholarship I receive in “X” of 500.000 CLP is just enough. Saving is not a possibility.

Post grade student, man.

LABOUR ENVIRONMENT

More respect for cultural differences and more transparency on the tasks distribution in the institute. Put an end to “same people always finish doing everything”. Avoiding susceptibility of labour conditions to social interactions: the no participation in informal activities and/or “fellowship lunch” should not have effects on the academic recognitions and the progress in the professional career.

Academic, woman.

I would like more empathy among teachers and students, as well as the reinforcement on teamwork over individualistic competition in the career.

Pre grade student, woman.

Equal conditions between peers.

Academic, woman.

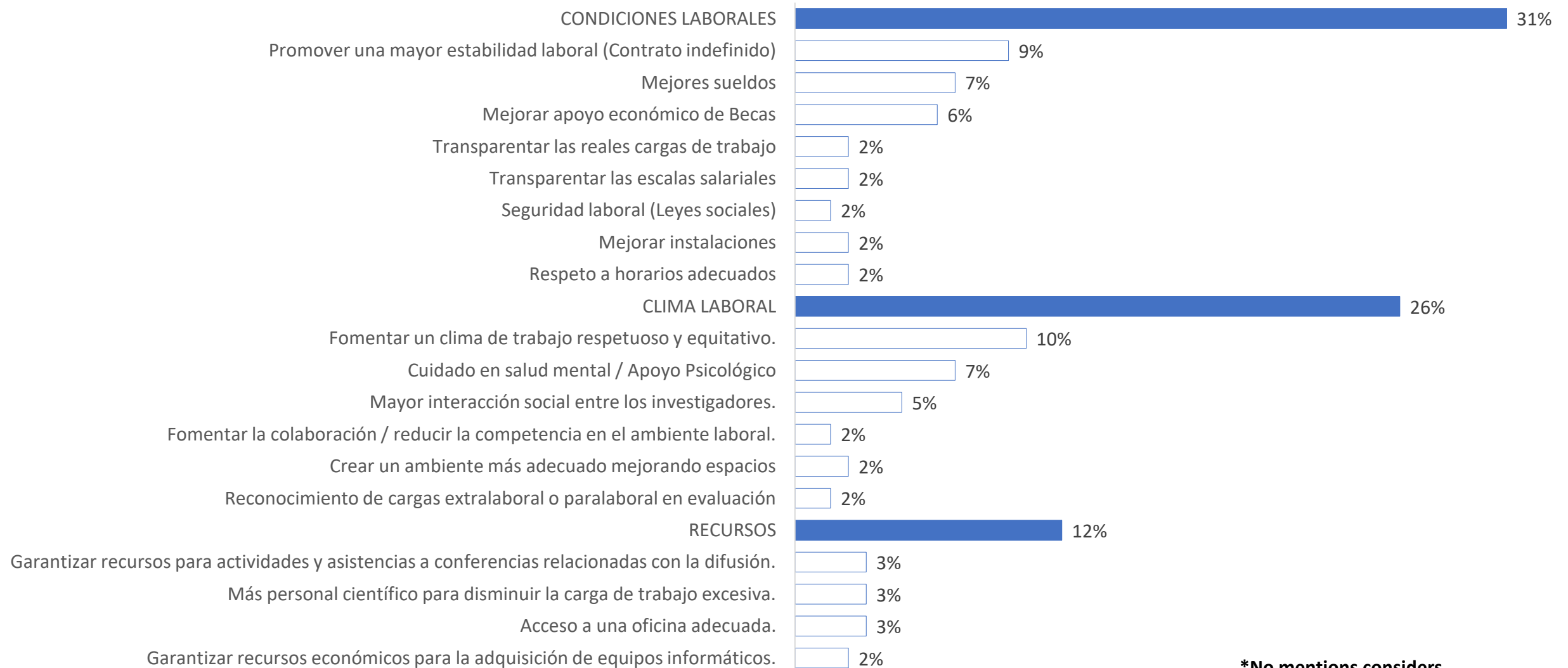
More concern on people’ mental health and more focus on teamwork, in addition to an improvement in the internal relationship of the different communities on this field.

Pre grade student, man.

Needs for a better labour performance



Tell us more details about what you would need for a better performance at your job:

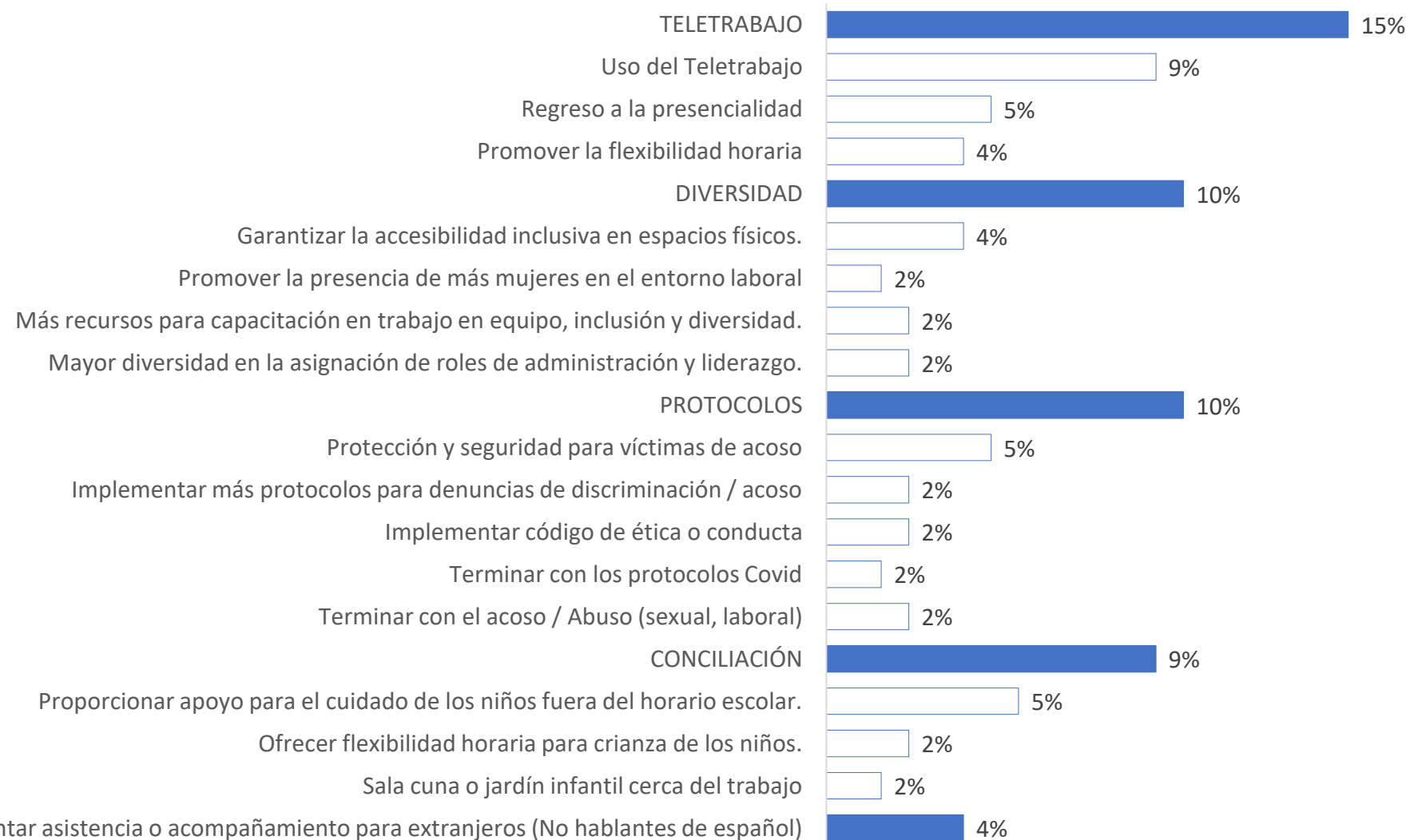


*No mentions considers

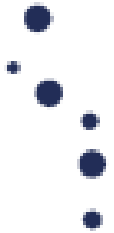
Needs for a better labour performance



Tell us more details about what you would need for a better performance at your job:



CONCLUSIONS AND RECOMMENDATIONS





CHARACTERIZATION

- SOCHIAS is comprised of a diverse community, **men are predominant**, both in quantity and **hierarchy** from different institutions, with a special focus on academics, technical, administrative and professional from observatory.
- The minority groups that have generally less participation among the astronomical community: indigenous people and people with disabilities. The higher participation in SOCHIAS, compared to the society, is from the **LGBT community**.



CHARACTERIZATION

- In the community, **women** participation is high, **the proportion, however, is not the same** in Chilean society. Similarly, their participation is concentrated on **science outreach and administration roles in universities**. Men tends to be the majority, among academics, postdoc. researchers, technical and professionals from observatories.
- Something of note is that, within SOCHIAS community, women (compared to men) **have had to postpone or resing to maternity**. In the same role (academic, Post Doc, etc.), it is always men who are fathers to a greater extent than the proportion of women who are mothers.

LABOUR CONDITIONS

- Situations considered as discriminatory or harassment have been experienced by a significant part of the SOCHIAS community, especially by women who are currently in the roles of **Post Graduate Students, Post Doctoral Researchers and Academics**.
- This discrimination is mainly due to sex or gender issues, that is, the fact of being a woman, where 50% of the women members of the community have felt discrimination because of this situation. In addition, there are situations of harassment that they often have to deal with, such as labour or sexual harassment.
- Men are not free from poor conditions in this regard. In their case, 30% of them have felt attacked in the labour environment, while 40% of women have felt the same way.



A woman with dark hair, wearing a light-colored blazer, is in an office environment. She has her right hand raised palm-forward in a 'stop' gesture. In the foreground, a laptop is partially visible on the left. The background shows office shelves with binders and books. A large, white, torn-edge graphic overlay is on the right side of the image, containing the title and a bullet point.

LABOUR CONDITIONS

- The **normalization of situations of discrimination and harassment reinforces their occurrence.** Among those who **have experienced situations** of discrimination, more than half consider that there are no situations that affect their labour performance. However, as we know, these situations do affect the labour environment, undermine trust among employees and ultimately affect the creation of high-performance labour environments, **even affecting the achievement of institutional goals.**

NEEDS FOR A BETTER PERFORMANCE

- In order to correct the situations described previously, it is important **to communicate the protocols that prohibit and prevent harassment, discrimination and bullying in all its forms, both in labour institutions and universities.**
- There is also a need to continue with awareness-raising programs on care and good treatment within the organizations, especially in the topics of Sex and Gender, disability and Social Interaction.
- Nowadays, there is a wide variety of institutions that develop this type of intervention and that improve the labour environment and prevent future situations of abuse or discrimination that always affect the community as a whole and not only the people directly involved.





NEEDS FOR A BETTER PERFORMANCE

- Working conditions are reported as being too strict or demanding, while promotion conditions are not completely understood in some institutions and are described as "poorly transparent". Also, there is a need to improve economic conditions and stability, especially for those who work on projects, particularly the group of postdoctoral researchers.
- The work-life balance is also an increasingly strong need for the realization of those who decide to take the path of parenthood. And it is precisely in this group that the need for flexible working hours, hybrid work and teleworking to reconcile both worlds appears to a greater extent.

Sources:



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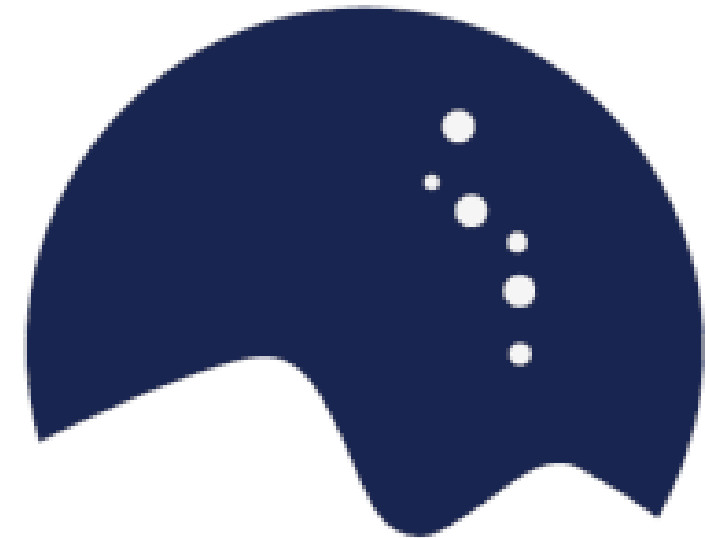


Sociedad Chilena de Astronomía

Inclusion and Gender Diversity
Group

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First and second Instrument

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SOCHIAS
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