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THE SOCIAL CONSTRUCTION OF SCIENCE CASE OF RESEARCHERS FROM THE NATIONAL SYSTEM OF RESEARCHERS IN MEXICO

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Abstract: The social studies of science are necessary to achieve equitable participation of women in the spheres of public order, understood as the politically, economically and socially recognized sphere. Particularly, gender studies with a feminist perspective make visible that women have been historically excluded from scientific scenarios. To this day, the glass ceiling continues to exist for female researchers. In scientific scenarios, the differences in the participation of women in evaluation systems such as the National System of Researchers (SNII) reveal inequalities that are addressed by the critical science of feminism. This article contributes to the theoretical corpus of the analysis of inequalities with a gender perspective in science and academia. It is pointed out that one of the factors that intervene in the invisibility of female scientists are the disputes that women have in the domestic or private sphere and the public or scientific/payed/recognized sphere.

INTRODUCTION

In Mexico, the evaluation and recognition system for scientific human capital is the so-called National System of Researchers (SNII), which was created in 1984 with 1,396 researchers, of which only 19% represented women. Although this participation rate has increased by 2024, where there are 41,351 researchers, there is a representation of 39% of women. The parity quota is far from being achieved due to various factors that feminist studies attribute to power matrices framed in a capitalist/patriarchal system in science. This article contributes to the theoretical corpus to understand that the differences in women's participation in science are reflected in reproductive work performed by women. The trajectory of female scientists analyzed from a feminist perspective makes visible the disputes in scientific (public) spaces and domestic (private) spaces.

The capitalist/patriarchal system is a historical system of dominance of gender/race and social class power matrices.

THE FEMINIST MOVEMENT AND SCIENCE

Guzmán and Pérez (2005, p. 637) point out that in recent years the influence of the feminist movement has led some women scientists such as Fox Keller or Ruth Bleier to analyze scientific-technical development and the history of science from a new approach, adheres to the concern of being able to participate equally in the formation of science: "the scientific-technical disciplines have been built from an androcentric discourse, which has meant an added difficulty to the equal incorporation of women."

Feminist studies in Europe and America, as Schiebinger refers (Cited in Guzmán, 2005, p. 637), aim to no longer emphasize the great achievements of women in science but to politicize the sphere of caring for the home and children.

The politicization of domestic life implies questioning the way in which women have "naturally" been assigned the care work, domestic work, and affection work that feminist economists call "social reproduction work."

Women who carry out science in Mexico and in other latitudes face disputes that are far from reconciling family and scientific life. Various empirical studies indicate that scientists face patriarchal environments as there continues to be disparity in domestic settings where women are still in charge of the work of social reproduction, understood as domestic work, care work, affection, and biological reproduction. The feminist political economy perspective valorizes the work that keeps spheres public or monetized.

The imbrications of power of patriarchal societies are present in science, understood from a hegemonic perspective as exact, impartial

and objective. However, social studies of science argue for the social construction of science. Fox (1989, p. 13) in his work "Reflections on Gender and Science", states that: "*both gender and science are socially constructed categories.*"

Science is not only delimited by its methodological and epistemic rigor, there are mechanisms that influence it. As happens in the generic construction, culture occupies an integrating piece of scientific environments, Fox (1989) refers:

> Science is a set of practices and a body of knowledge delineated by a community, not defined solely by the demands of logical proof and experimental verification. Similarly, masculine and feminine are categories defined by a culture, and not by biological necessity. Women, men and science are created together from a complex dynamic of interwoven cognitive, emotional and social forces, influencing the construction of men and women in the same way of seeing science (Fox, 1989, p.13).

Fox (1989) argues for the possibility of changing the way science has been constructed, and recognizes that her research arises from the combination of two major topics, social studies of science and feminist theory. Thus, it is considered that the masking of the exclusion of women in science can be observed at the moment when new ways of doing science emerge, such as the application of gender studies.

Barral (1999) recognizes that there are external factors that influence the construction of science, in addition to giving importance to the subjectivities of the actors involved in it, a situation that does not occur from the hegemonic perspective.

The study of the spaces where science is produced is a new perspective of study, as has been pointed out, when studying science as that susceptible to political and structural power systems.

Pérez (2011) argues that Science and Technology are intellectual products of the society from which they arise and which they serve, recognizing that a society with gender inequalities necessarily produces a culture, science and technology impregnated with gender biases.

Barral (1999) and Pérez (2011), in addition to assuming that science is in itself an object of study and criticizing its interference in society, highlight the need to include a humanist project to the objectives of science. Science and Technology, a constant in the present research work, which is to add the critical and reflective aspect to scenarios considered irrefutable due to the fact of being scientists, however within this environment, as has been pointed out, there are constant injustices that sometimes Throughout history they have been carried out, first in the way in which women are excluded from science, second in their little participation in epistemology.

The scientific discipline of history provides knowledge based on the analysis of the journey of women scientists, such as authors such as Schiebinger (2004) in her work "Does the mind have sex?" recounts the obstacles that women overcame when trying to participate in the exclusive roles of men destined for scientific practice. The author makes a historical compilation of the problems that women scientists faced during the 17th and 18th centuries in Europe, describing the rugged terrain that women had to face in a nascent science, where The ideas of the essentialists led to the non-incursion of great scientists into the public environment. Given this fact, we can understand why there are so few names of recognized scientists. In this work she tells how they were punished for going against the morals of those times, by participating in the public spheres of science, a task destined exclusively for men of that time.

Within the critique of the relationship between gender and science, Vianello (2002, p. 152) establishes that:

> Over time (at least until the 20th century) there have been almost no women who have left a clear and deep mark on them, comparable to what men have left. The traditional explanation is attributed to female inferiority or the natural apathy of the so-called "weaker sex" towards these issues. However, in reality it is due to the fracture that women have always perceived between the way in which mental schemas have been formed and their direct experience of daily life that has meant that they have always ended up believing that the resulting discomfort was proof of their own incapacity and subordination. A gap that has only recently begun to close.

The considerations of Vianello and Caramazza (2002) are directed at the display of discrimination and exclusion towards women dedicated to science throughout history. Female scientists are little known due to the mechanisms of domination that were exacerbated before the 20th century, however in recent times they are still at constant disadvantages, national and international organizations recognize this, as can be seen in the next chapter.

The arguments point towards the invisibility in which women have remained, in their desire to participate in science. Harding (1996), in her work "Science and Feminism" points out in this regard:

> The subordinate place that women historically occupy in science. Consequently, its invisibility, even for advanced historians of science, was due to the intentional masking of its presence in the field of science (Harding, 1996, p. 53).

For her part, Clair (1996) points out in her work "*The scientific training of women. Why are there so few female scientists*?" that although the limited contribution of women to scientific and technical development has been systematically pointed out in almost all international meetings, States do not always mobilize with the determination that would be necessary to solve a major problem, pointing out that this weak Female participation is verified in all sectors of scientific life research, higher education, technological transfer and the reports of international conferences, which have not ceased to record it, "insist on the growing incidence of scientific activities in economic development and about the imperative need for a sustained effort on the part of governments to remedy that situation" (Clair, 1996, p. 10-11).

Clair (1996) calls on States to take action to reduce this gap in the participation of women in science, and not only their inclusion, but also the form and situation in which women scientists are immersed. who must also develop the gender roles dictated by patriarchal culture, making the problem worse in Latin American latitudes such as Mexico.

For Baute (cited in Pérez, 2011), there is hierarchical discrimination in bright and capable women, who are kept at the lower levels of the ladder or encounter a "glass ceiling" that they cannot cross in their profession, that is, they endure covert forms of discrimination, just as they follow very subtle patterns and, in many cases, unconscious and hidden from those who exercise discrimination.

Gender and science studies represent a door, which recognizes that in elite settings such as the sphere of academia and research there is discrimination, disadvantages planted according to history in the way in which women venture into science.

One of the investigations carried out at the UNAM, regarding the form of discrimination exercised against female researchers, is the one presented by Russell (2003), who conducts research regarding production indicators by gender, in which he highlights that generally women They demonstrate lower levels of

production than their male counterparts, inferring that science as an institution suffers great inequalities in the achievements of its actors.

Another position is that presented by Bonder (2004), in his work "Gender Equity in Science and Technology in Latin America: Bases and Projections in the construction of knowledge, agendas and institutions" where he recognizes that there are points of resistance on the part of scholars of gender and development since they consider the issue of science and gender as an elite problem, however the author points out that the dizzying nature of S and T and, in particular, its radical impact on all dimensions of life social, are contributing to increasing the visibility of some problems that "speak" of particularities in the relationships that women maintain in S&T and/or of differences and even more so of inequalities between men and women in these areas.

Russell (2003) and Bonder (2004) refer in their studies to the complexity of the injustices referred to by Young (2000), which represent the challenge of scientific institutions with respect to the demands of women who are in the public environment of science and academia.

The participation of feminism in science studies, as an object of study, are lines of research, put on the table, Guzmán (in Blázquez, 2005, p. 650-651) indicates that "the initial concern of feminism to integrate women in fields that had been closed to them implies a clear commitment to the transformation of science and technology. The author suggests that the adoption of the gender perspective allows a vision in which attention is payed to diverse, until recently unsuspected, facets and aspects of S&T, where mechanisms and attitudes of discrimination towards women still prevail in the world of science.

Precisely, what Guzmán (2005) alludes to is one of the bases on which the research thesis is built, that elite character that is not under suspicion of being under systems of power. The arguments described in this section on science and gender have the objective of presenting part of what has been written and carried out regarding the relationship between science and gender, identifying within each of them the injustices experienced by dedicated women. to science, also highlighting the area of opportunity within science, as a social construct.

THE EXCLUSION OF WOMEN IN PUBLIC SETTINGS

Within the development plans of any country, such as Mexico, whether as a criticism or alternative to development, addressing women's issues is a central issue. World organizations do not discriminate in these areas in their agenda, although for their achievement critical views on their execution and scope must be addressed. The United Nations Information Center (UNIC) identifies as objectives for "the advancement of women" both: "a) the empowerment of women and their enjoyment of Human Rights; b) development assistance activities, c) gender equality and d) the participation of women in the various aspects of economic development. However, women as a social group cannot be seen as passive subjects of public policies without unraveling the economic, political, social, and subjective obstacles they face in capitalist-patriarchal societies such as the case of Mexican society.

Achieving gender equality is one of the commitments in the Sustainable Development Agenda for 2030, goal 5.4 establishes that: "Recognize and value unpayed care and domestic work through public services, infrastructure and social protection policies.", and promoting shared responsibility in the

home and family, as appropriate in each country. With this goal we can observe the incursion of public policies into domestic or family life to propose the so-called "co-responsibility" with domestic and care work.

Although the United Nations Organization, through the Commission on the Legal and Social Status of Women, makes recommendations to promote the rights of equality and equity in various aspects such as political, economic and social, and in turn have led to held 4 world conferences - highlighting the Fourth World Conference on Women held in Beijing, China (1995), which has five-year follow-ups, preceded by Nairobi (1985), Copenhagen (1980) and Mexico City (1975) -, still There are stereotypes and gender roles in so-called democratic societies that point to discrimination, subordination and exploitation of the female gender. Of the global meetings, the agreements established at the 1995 conference, signed by more than 180 countries, stand out, which promote:

> Gender equality is a shared vision of social justice and human rights. All humanity has the responsibility to act, and especially governments as the main guarantors of rights. We must take advantage of all existing opportunities at the national, regional and global levels and give new impetus to the goal of gender equality, women's empowerment and the realization of the human rights of women and girls. (Beijing Declaration and Platform for Action, UN Women, 1995, p. 5)

To review the established objectives, meetings have been proposed every 5 years through the so-called Beijing platform; subsequently, regional evaluations will be added to the Beijing+15 and Beijing+20 platforms. Regarding the actions carried out by the UN, the Convention for the Elimination of all forms of Discrimination against Women CEDAW stands out, as a response to the recognition that there are various mechanisms of discrimination in public spaces where the female gender operates.

Even with the various provisions of the UN, there are outstanding debts with the issues of women's demands, such as public policies that address the difficult reconciliation of family life with recognized and payed space. It is necessary to make the private or domestic space (where the work of social reproduction takes place) political.

According to the Gender Equality Observatory of Latin America and the Caribbean (OIGAL) (2015, p. 1):

> The situation of women in Latin America and the Caribbean has improved since 1995, the year in which 189 countries signed the Beijing Declaration and Platform for Action, but progress has been uneven and heterogeneous, and inequality and discrimination continue to affect many women in the region, preventing the achievement of their full autonomy, which is essential to guarantee the respect, exercise and enjoyment of their human rights and to achieve equality.

It would seem obvious to say that women have gained space in various public spheres, such as the presence of this social group in the parliaments of the various countries that make up Latin America and the Caribbean. OIGAL statistics (2015) report that the percentage of participation has risen from 12% in the 1990s to 26.4% in 2014. However, this representation is still far from indicating that there are no pending paths to follow in the search for a effective equality in the exercise of their autonomy. These percentages reflect a situation similar to the representation of women in science and academia, which will be analyzed later.

Since women have been incorporated into economic and social processes, a dichotomy has arisen between the public and private spheres, where, in most cases, there is a disadvantaged position in reconciling private and public life. Women have accepted job positions with fewer job guarantees in relation

to men, translated into a greater number of activities and responsibilities in the family, maternal, work and even community spheres, thus representing greater social demands to fulfill "well" their functions granted in the sexual division of labor carried over to our days. This disadvantageous situation has led to unfair time management observable in institutional time management surveys.

In Mexico, national statistics, presented by the National Program for Equal Opportunities and Non-Discrimination against Women (PROIGUALDAD 2013-2018) issued on August 30, 2013, indicate that:

> In the last 40 years, the insertion of women in the workplace has increased without this having brought about real equality in working conditions, or in the distribution of domestic and care obligations. The double and triple shifts that women work are documented and show the most deeply rooted conditions of inequality between women and men. If payed and unpayed work are considered together, women work more hours per week than men; The total weekly working time of women is almost 60 hours and that of men is just over 50.
>
> […]The main and most solid barrier that women face to achieve their economic autonomy is the unpayed work they do in their homes (domestic tasks and care of infants, the elderly, the disabled and the sick), work that has an economic value and social, but which neither receives remuneration nor is it distributed equally between women and men. The contribution that people, basically women, make to the well-being of families with their unpayed work is estimated at 21.6% of GDP (PROIGUALDAD 2013-2018).

In this sense, Vázquez (2010) argues that in recent years, women have obtained important achievements by expanding their participation in the "world of men", however, "those men" have not been fully incorporated into the " activities of them. The sexual division of labor is little addressed by hegemonic economics, although progress has been made in the incorporation of the gender perspective in the economy, as well as in the theoretical contributions of feminist economics, we continue to be dragged into public and private spaces a hegemonic, heteronormative and androcentric economic-social model.

It continues referring to PROIGUALDAD (2013-2018):

> It is a fact that women participate in payed activities in a lower proportion, their participation rate is 43.5% and theirs is 77.5%, due to the fact that they have to perform unpayed work in their homes. Women are mostly employed as workers. salaried workers (62.5%), and as self-employed workers (23.5%). Female employers only represent 2.5%, while male employers reach 6.1%
>
> The wage discrimination indices by occupation and sector of activity show that women earn 30.5% less than men in industrial occupations, 16.7% less as merchants and 15.3% less as professionals. By sector of activity, the index is almost 20% in commerce, 18.1% in the manufacturing industry, just over 14% in construction and more than 10.8% in social services.
>
> […]Of the little more than 18 million employed people in the country who have a formal job, 62.3% are men and 37.7% women» (PROIGUALDAD 2013-2018).

These situations of disparity in the participation of women, not only scientific but also public, which include various social-economic aspects, allow us to establish that essential terms must be addressed, such as "justice" applied to the way in which public spaces are distributed by gender, which is the topic that concerns us in this research thesis.

In this regard, Young (2006, p. 60) indicates that justice is "an idea that moves from an approach based on distributive models to procedural issues of participation

in deliberation and decision-making." That is to say, although we can observe that the representation of women in various public and private environments represents an unequal distribution, we must question the way in which they participate and whether they have total autonomy to decide their actions.

The author points out "For a certain social context to be fair, it must allow all people to satisfy their needs and exercise their freedom; This is how justice requires that all people be able to express their needs" (Young, 2006: 60). Therefore, these figures on women's public participation, which indicate numerical inequality, open the way to questioning what the link between justice and politics is.

> As I understand it here, the concept of justice coincides with the concept of the political. Politics includes all aspects of institutional organization, public action, social practices and habits, and cultural meanings, to the extent that they are potentially subject to collective evaluation and decision-making. In this inclusive sense, politics naturally includes the initiatives and actions of the government and the state, and in principle it can also include rules, practices and actions that take place in any institutional context (Mason, 1982, p. 11-24, cited in Young, 2000, p.

In that sense, public policies with a gender perspective are a requirement in the debate on the reconciliation of time between family and scientific life, as is the case of the study. Female researchers who carry out tasks in the domestic and work spheres face obstacles in self-determination as they are not able to "be and do" in the face of work scenarios that do not foresee the dilemmas of being "women" and scientists.

CONCLUSION

Science and gender are constructed environments, where one is not born but rather made, that is, the way in which one is a man or woman cannot be taken as "natural", as well as the way in which science is presented in the present. The opportunity must be given to the effect of change and construction, the possibility of including universal values of justice, equality and solidarity for a new human coexistence in various scenarios, such as science and the domestic sphere in which the scientific human resource is found. .

Although feminist critical theory allows us to see the invisible, regarding the relations of dominance and power within the patriarchal system, the same reflective nature of science must allow the inclusion of universal values in interactions within the public sphere in which develops scientific human resources. This article contributes to configuring and recognizing science as a social construct. The participation of women in the SNII in Mexico is an indicator that shows the low participation of female scientists in the public sphere, which represents 39%.

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