

BARRIERS TO THE SCIENTIFIC PRODUCTION OF THE FEMALE UNIVERSITY TEACHERS OF THE HEALTH SCIENCES AREAS

Adolfo Alonso-Arroyo

Universitat de València

Facultat de Medicina i Odontologia

Departament d'Història de la Ciència i Documentació

Spain

Esperanza Gómez-Guardeño

Universitat de València

Facultat de Ciències Socials

Departament de Sociologia i Antropologia Social

Spain

María Eugenia González-Sanjuán

Universitat de València

Facultat de Ciències Socials

Departament de Sociologia i Antropologia Social

Spain

Rafaél Aleixandre-Benavent

Unidad de Información e Investigación Social y Sanitaria (UISYS)

Universitat de València

Spain

ABSTRACT

To discover the features associated with personal and professional lives of university teachers, in the area of health sciences in the “Comunidad Valenciana” for the period 2003-2007, to learn if they contribute to a greater or lesser scientific productivity. Were interviewed in depth 30 teachers aged between 30 and 60 years in order to identify factors that hamper productivity. Have more difficulties to publish scientific papers, teachers less productive. Represent obstacles: the labor problems, the difficulty to obtain science projects and to publish in certain journals, to balance teaching and research, care work in hospitals, the maternity and children. Although the two groups of large and small producers point to the same problems in their work and personal life, are perceived more difficulties in the group of less productive. Most offer the same kind of solutions to reduce the gender distance.

Keywords: Scientific Productivity; Scientific Papers; Academic Teachers; Health Sciences; Difficulties and Obstacles; Gender Studies.

1 INTRODUCTION

The progressive incorporation of the women into the labor market is undoubtedly one of the most prominent facts that the Spanish society started over the past decades. Their inclusion, however, besides not releasing them from domestic work and family obligations, was accompanied by numerous differences and gender inequalities.

The horizontal or occupational segregation is undeniable: the women are located preferentially in certain occupations¹. The vertical segregation or by occupational categories put women in a position clearly unfavorable, mainly when it is observed that the graduation levels are not the only ones that mark the differences in access to certain labor categories (ARRANZ, 2004, p.225).

This double segregation or discrimination is reflected by statistics on education in Spain, because despite being a female sector employment, women's participation is reduced as the level of education increases. Currently, besides the women represent only 37% of Spanish university professors (GUIL, 2005; GARCIA DE LEON, 2007, p.263), as they ascend less, they have less weight in positions of greater responsibility or hierarchical power within the university institution and represent the worst figures in scientific production indicators (BALLARIN *et al.*, 1995; ORTIZ *et al.*, 1998, 2000).

Given the situation of the female population discrimination, the Directorate General for Research and Innovation from the European Union has established an Expert Working Group on Women and Science (ETAN), which produced a report which analyzed the situation of women in this scope and series recommendations were performed to promote gender equality. In Spain, the government concern to promote gender equality in the scientific scope has as one of the most important achievements, the creation in 2005 of a specific organization linked to the Ministry of Education *Unidad de Mujeres y Ciencia* (UMYC) [The Women and Science Unit] whose mission is to promote the inclusion of women, on equal terms, to the scientific and technological Spanish system.

It is not only about adopting measures only for equity, opposing to that those circumstances which become obstacles to professionalization of women and to their

promotion in the academy and research (FUNDACIÓN..., 2005), but also to adopt measures for reasons of economic competitiveness (and not to lose the important scientific potential they represent) and of scientific neutrality.

To avoid the loss of scientific production of women, different countries have adopted positive discrimination policies compatible with a proper scientific policy, which is based on criteria of merit and academic excellence. In Spain, the former Ministry of Education, Culture and Sport has put in place to measure to prioritize research groups that incorporated more women or which were headed by women, with equal scientific merit, and whenever the projects would exceed a minimum standard of academic quality (QUINTANILLA, 2008). Regarding scientific neutrality, the analyzes performed since the gender perspective show that the patriarchal system bequeathed a model of androcentric culture or of domain of male vision about knowledge and the production of reality (FLECHA, 1999, p.239-240).

From the different scientific disciplines, the Health Sciences represent a paradigmatic case, especially the medicine, for having developed over centuries of history the men's professional identity (ALVAREZ, 1988; ORTIZ, 2006a, 2006b). The monopoly of men supposed the building of a medical knowledge mastered by gender orientation, not only for having sustained on the male biological model (VALLS, 2001), but also for depreciating certain outcomes or symptoms, because they were expressed by women.

The truth is that, although more than three decades the female presence is majority in the classes at the colleges and schools of the Health Sciences in Spain, the women are underrepresented in academic and scientific activity. The so-called 'glass ceiling' or set more or less subtle but powerful of access barriers to women to key positions in the academy and research, is especially flashy in the medical science (PÉREZ; ALCALA, 2006).

However, the assessment of the situation of the women in the Health Sciences scope finds the difficulty that supposes the absence of reliable, accessible, harmonious data and separated by sex and professional levels. One way to know the female's participation in scientific activities is by carrying out bibliometric studies separated by sex (BORDONS *et al.*, 2003; MAULEÓN; BORDONS, 2006; GONZÁLEZ *et al.*, 2007). These studies constitute one of the basic pillars for

deepening into gender inequalities in the system of science and technology, as they provide objective information necessary to establish the basis of a scientific policy for the promotion of the researchers. Another cornerstone consists of being in the lives of women to discover their activities and interests in the production of scientific knowledge. Through the present study, we intend to find the obstacles and difficulties that the university teachers find in the area of the Health Sciences, in Valencia, during the five-year period 2003-2007, and which reflect on a higher or lower productivity.

By situating ourselves in the perspective of the subjects, both women and men, we can make several kinds of arguments to explain the asymmetry or gender discrimination (ARRANZ, 2004).

- 1 The discrimination of the women in university is an issue that is likely to be overcome by the future of social evolution. Every social change is slow, and you need to wait.
- 2 Gender inequalities in the university community are a product of greater intellectual preparation of men, to whom the society offers more possibilities. In a meritocratic society in which both sexes have the same opportunities, inequality will disappear, if educational efforts of men and women are equivalent.
- 3 The male hegemony in the university is due to the fact that the women prioritize their female roles rather than their academic career. The dilemma of many women is that if they follow the patterns of gender, they cannot compete with men, while if they reach professional recognition, they may make a mistake in the performance of some roles assigned to them.
- 4 The male domain over the knowledge and the scientific practice, and the mechanisms of female submission, product of the subjectivity built under the controls of gender, are the factors that determine gender inequalities.
- 5 The female teachers dedicate more time to teaching than the male teachers, which implies logical reduction of their scientific production. Until today, the sexual division of labor also ranks the teaching and the

research, and although both activities are part of the tasks of academics, the teaching is less recognized (IZQUIERDO, 2008).

- 6 In the academic and scientific world, the women face more barriers than the men because "gender effect" intervenes. They must do more to be considered equivalent.
- 7 Listening to the voice of the university female professors of Health Sciences, in Valencia, will allow us to know what the predominant speech is though perhaps the speeches are not as sharply differentiated as they were exposed here. Judging from research that explored the perceptions of the teachers and researchers in Spain, the university teachers have a clear awareness of the situations of discrimination against women in science and technology, awareness which is more acute in the case of the female teachers. But they are the extra-academic researches that show a greater degree of knowledge about the gender constraints that act as barriers to the recognition and prestige of the women in the scientific work, including: female heteronomy, double shift, invisible work or family and domestic responsibilities² (SANTAMARÍA, 2001). It was also found that, although most of the teachers recognize themselves as collective with equal or greater value than their male counterparts (better in academic preparation, dedication and organizational capacity), the teachers expressed that their social and academic situation is more negative than theirs (less support from the department, fewer possibilities for promotion, greater family obligations, etc.) (ARRANZ, 2001).

2 METHODOLOGY

The study is based on an analysis of 30 (thirty) in-depth interviews conducted following the methodology of history of life, with university female professors in the field of Health Sciences, in the Valencian Community. The sample selection was made from a database generated, on which appears the sex of authors and female authors of the articles on Health Sciences produced by the Valencian Community

Universities and inserted into the databases *SCI-Expanded/Science Citation Index Expanded* and *IME/Índice Médico Español* over the period 2003-2007.

We interviewed 15 (fifteen) large producers (who have written ten or more scientific articles) and 15 (fifteen) small producers (teachers who have published less than ten articles). The interviewees were aged between 30 (thirty) and 60 (sixty) years. We interviewed 18 (eighteen) full professors, 7 (seven) hired 4 (four) members, 2 (two) hired doctors and 1 (one) with a contract research) and 5 (five) full professors. The interviews lasted about 1 (one) hour and 30 (thirty) minutes. Many people refused to participate in the study, for being with a lot of work. In one case it was asked to stop the recording during the interview so that the professor could speak more openly about personal, academic past and conflicts experienced at the departmental level.

To schedule the interviews, the teachers were contacted through email and telephone. It was explained to them the purpose which was intended to achieve with the study, the methodology that would be followed and the duration of the interviews. It was also emphasized the confidentiality of them, moreover, that there was the possibility of being asked questions and the doubts clarified. Subsequently, the interviewer went to the different college campuses where the teachers were (*Universidad Jaume I de Castellón, Universidad Miguel Hernández de Elche, Universidad de Alicante, Universidad Politécnica de Valencia* and *Universitat de València*).

In most of the cases, the interview took place in the workroom of the teachers interviewed. It was asked the social context in which are born, their academic and professional career, the relationship they establish with colleagues, support for publishing articles and accomplishment of research projects and the obstacles that slow the productivity.

The interviews happened according to an established script. All of them were recorded and transcribed. Later they were coded into categories and subcategories, according to the main lines of the script of history of life. The analysis was performed using the computer program *Atlas.ti*.

3 RESULTS

3.1 Contextualization

All of the university professors, with 10 (ten) or more scientific articles, proceed from a very stable family situation, on which they relied on family support, both economic and moral, to study and make college career. Most of them come from upper or upper middle class families, on which some of their fathers owned a company or had higher education.

Regarding their own family situation, many of them are married and have children, with an average of 2 (two) children per woman. Out of these teachers, it is worth noting that some are married to a person with whom they work together in the same department or research projects. Their husbands are professors or full professors and, in one case, a researcher. Working in the same area of knowledge or in the university context is a common aspect for almost all the interviewees. They form a smaller group the teachers with stable union. They are also a minority the single and the divorced ones. Nevertheless, not having a stable sentimental relationship was not an impediment at the time of forming a family, since some women resorted to adoption.

It is a common aspect for some of the most productive teachers to share the task of research with a man who is their husband or loving partner. As one of the interviewees' reports below, this fact had two objectives. On the one hand, it is related to the idea of women breaking free of misogyny and on the other, to get a certain level of productivity:

Throughout this story there is information which I did not tell you and I did it on purpose, and I'll tell you now, is that eehh, my husband, he holds this department too, right?, But he dedicates to the assistance work, mainly ok, ie to the hospital, he has a position linked to teaching and to the hospital, ok then eeehh, this is my opinion, can be very different, but eeehh he, part of the research, largely, he left under my coordination, right, and then eeehh, of these projects, out of these four people [...] on this network, the node of the department, eee, and therefore the main investigator [...] out of this node... is my husband, right?; so here we have two contracted and then the other two are with a project of mine, my research [...] and another person who we have for a cross-action, related to this network [...] So actually I coordinate them and they are working under my direction

obviously, but, and I believe that there I got free of the misogyny through my husband, clearly (Violet).

The husbands of some of them work in the academic scope, dedicating to the research or to the teaching, but they do not make part of the same research team, and neither find themselves working in the same university department. The partners of the other interviewed exercise their profession in the field of Health Sciences; they are doctors, or do a job completely different from theirs. There is in this group 3 (three) singles without children, 1 (one) divorced, and 1 (one) widow with 3 (three) and 2 (two) children respectively.

3.2 Studies

Many of the university teachers, with 10 (ten) or more scientific articles, graduated in private colleges. In most of the cases their parents paid their studies and their housing until they finished college. Exceptionally, the scholarship resource appears in a form of financing. Most of them worked only during the summers tutoring. When asked about favorite subjects during their studies, all of them reiterate interest in science, history and art history. However, the reasons that made them choose their career are disparate: because they liked, in order to get out of Valencia, influenced by their parents or relatives, because they wanted to devote themselves to research, because they saw demand, for vocation or because they chose without knowing well what it was about. Exactly the same features are found in the case the university teachers with less than 10 (ten) scientific articles.

Once completed the studies, the cutoff score of academic hours varies between the large and small producers. Almost all of them had direct linking, once completed their degree with the university, either through collaborative scholarship, research or administrative work. At the same time they reconciled that work with their doctoral studies. The evolution is similar for all the teachers, who passed through different grants or temporary contracts to perform the teaching until they achieved a more stable position as a professor or researcher.

Regarding professional supports which the most productive teachers had when they began their academic career, some of the interviewees expressed having

lived a difficult relationship with their colleagues or bosses, highlighting the existence of a complicated pyramidal structure; others recognize that the relationship with their thesis advisor was good, and they are a minority who say they got along well with their coworkers. The situation is similar in the case of least productive teachers, once almost half of them points that the support received from their advisors or boss was good. The rest indicates not being happy with the guidance received while conducting their thesis.

Half of the teachers, both large and small producers, took part in research projects during their doctoral studies. However, the most productive teachers at this current time are the ones who in that period of time published more, publishing twice more than the least productive ones. On average, the teachers with the highest number of articles counted on, at the moment of publication of their thesis, with 7 (seven) documents each. The least productive teachers with 3 (three).

3.3 Professional Career and Barriers to the Productivity

Most of the teachers, both the most productive and the least ones say that they received economic and moral support from their parents or loving partners throughout their careers. We can see this reflected in the following testimony of one of them:

It depends a lot on the facilities that they have had in the middle, because, because, if a woman married a different husband she could not have got, I believe she could not have got to tell him goodbye I'm leaving for Paris, neither would have got to tell him, listen that, as I often tell you, you make the food because I will not make it till five, of course (Silvia).

Despite of these fundamental supports on a personal level, the difficulties on which many of the teachers are today are different and varied. Coincide both groups in the type of obstacle, but more problems are detected in the group of the least productive teachers (Table 1).

Table 1: Factors that hinder the scientific productivity.

Factors	Professors > 10 Articles	Professors < 10 Articles
Maternity and children	1	3
Care work in a hospital	3	1
Reconcile teaching and research	2	3
Difficulty obtaining scientific projects and publishing in certain journals	1	5
Labor problems (a lot of work, hierarchical structure headed by a man or a bad environment that resulted in disease)	5	5

There were interviewed ones who recognize that being a mother and having children is an added difficulty which is intrinsic to the condition of being a woman. As for example, what the following teacher says:

So there is in my resume, you will see that there are some huge gaps that coincide with the children, and coincide with the overcoming of my mishaps slightly, separations, and then about that I was asked sometimes in a contest, listen, how do they exist, because you see, is that I am a woman, I have children and I separated and I had to redo the house. Because when I separated and I was going away with my car, the child and the dog and the toy, in other words I went away and I would build a new house (Rosario).

On the other hand, the difficulty to reconcile teaching, research and care work arises. The following example is the one of a professional with more than 10 (ten) articles, who began her care work at a hospital while she performed her thesis. The interviewee recognized the difficulty of reconciling the three tasks and proposed that the assessment of the research, of the professionals who dedicated to care work, should be different from the one that is applied to basic researchers and teachers:

Well, we always said the same, that we welfare, we must be assessed in many ways, it would be better if it was not at the level of the researcher, because we have not reached the level of the basic researcher, and you're in an applied research, providing assistance to patients, and then there should be another way to assess us teachers who dedicate ourselves to the service, which is another completely different group, the basic which dedicate only to teaching is one, it is assessed by some measures and some criteria, and we that dedicate to health care, to the patient, are evaluated in the same way as the research criteria, and this has nothing to do (Fernanda).

This protest also happened with the teachers who have less than 10 (ten) articles, the ones who indicate the care work in a hospital, as a factor that restrains the productivity.

Moreover, there are women who claim that it is difficult to devote themselves to teaching and being a very productive teacher at the same time. As the following interviewee indicates, if the university wants to have good teachers, they cannot nor should require the same of a researcher and a teacher and researcher:

I have to prepare the lesson I have to give. Eeehh, does this limit or not my research time? If I compare with my previous ten years, it is logical. And more, it is obvious to me, you cannot, nor should require from me the productivity that I had before. It's not fair, if they want to have a teacher. Because, that's for this reason that they do not have the teachers they should have, for consenting the non-faculty dedication. And you're talking to someone who was not a teacher (Juana).

The number of years devoted to teaching and research is not a factor that affects higher or lower productivity. In each group, of large and small producers, they were counted teachers who since the publication of their thesis, worked for 20 (twenty) years or more, some, between 10 (ten) and 20 (twenty), and others, less than 20 (ten) years. This establishes that there are teachers who working for a short period of time, proved to be very productive.

However, the less productive women find more obstacles than the most productive ones, highlighting the difficulties of obtaining scientific projects or publishing in certain journals. There are teachers who believe that, inside the area in which they work, publishing articles is more complicated than in other thematic areas.

The most productive teachers, except the youngest ones, have more than 50 (fifty) articles each. The least productive ones in general, do not have more than 30 (thirty). Similarly, their participation in research projects is smaller than that of teachers with more articles. The main difference is that the most productive teachers take part of more numerous research teams, with scholars that they coordinate in collaboration with their loving partners or other colleagues. At the same time, they continued to participate in new projects. On the other side, the least productive ones gave up this task for considering it too difficult or for thinking it was not worth:

Due to the difficulty, the difficulty, that it implies the great effort you have to do to, then after that you do not feel rewarded in any way, then, no, I fought

a lot, you have to work a lot, a lot of effort and then you do not feel rewarded in any way, neither at a personal level nor at the economic one. Then, no. Supposes a great effort the one to present research papers, the one to prepare the entire project, and then they are not approved, and if in any case they are approved, then you are working, overcoming difficulties, going against the tide in many cases and then the results it that the reward is minimal for the effort you make, and no, no (Estela).

When asked about the management positions that they occupied, teachers of both groups had a role as dean, vice-dean, secretary or department director, being much more numerous the responsibilities assumed by the most productive than the least ones. The most productive teachers appear, besides being performing these tasks, performing other functions in commissions, committees, coordinating Masters Courses, working on other official institutions as the *Agencia Nacional de Evaluación de la Calidad y Acreditación* (ANECA) [The National Agency for Quality Assessment and Accreditation of Spain] or presiding associations.

On the other hand, it is not a very relevant indicator the kind of professional category they got to because we found everything in both groups, however, it is true that it is greater the number of full professors in the group of teachers with more publications. Thus, there are 4 (four) full professors in the group of the most productive ones and only 1 (one) in the group of professionals with fewer articles. To continue, it is reported the episode about the bad environment at work experienced by the last full professor and which damaged her productivity:

I believe that only, uumm for working, eh, for being, for doing it well, for having uummm, uumm, some fame, not of a good teacher, finally, it fucked my, many of my colleagues and when I was at a determined time, after being a vice-dean, I was as the director of the department, the department director had requested a sabbatical period that did not reach one year, six months, and then I, after being vice-dean, I had never thought about being the director of department, mainly like this, what happens is, it was only during the time that lacked for the director to finish his term, and then, umm, good, he asked me [...] the first things he said were that it would not mind to me if they robbed banks outside the working hours, but they had to meet, and in a short time, uh, as the head of department, eh, eeeh, three full professors missed almost on consecutive days attested, three full professors, for sickness, with no communication here, just at university, three, these teachers soon denounced by bullying, and I was being denounced by harassment at work for two years. Reason, I am disappointed with the university, yes [...] (Constanza).

This complicated situation, which in some cases derived in serious health problems, also happens to other professionals, both in the group of the large

producers as to the least productive ones. They all think that the bad environment at work is not the most propitious to have a good productivity. Many of the respondents from both groups experienced hostility, bad relationships, disappointments, conflicts and were deceived by coworkers. It is even talked about mistreatment and moving labor.

What is reported to the continuation demonstrates that working and wanting to be a good professional is not always well seen by the people that surround us. Damaging through physical or psychological abuse, to prevent a person from advancing is something real that exists in some departments and workgroups:

The problem is that we did not have facilities because my husband, when I come, therefore, results that, they begin to give him prizes, prize for the best doctoral thesis, award for the best communication, the prize for the best work and then already at the department, as they could not attack him, they begin to attack me, and then they would not let me enter in the department until there was someone, they did not let me use the computer, they would not let me use the books, I could not use the phone, and they began to say that of course, that they had always taken a work pace in Valencia, and that pace of work I was breaking and I was damaging my colleagues, and of course I came from the University of Granada, from a very competitive pattern that had made me work a lot, and I liked my job, I was here because I liked [...] Do you know what it is going there and they do not let you go?, you do not enter, you cannot, and being on the computer get a husky head, and they beat you, eh, hit you, but physically give you a husky, get out of here, it is well, I do not know, good, and then many things, insult you in department meetings, good [...] (Clarisa).

On other occasions it is talked about a very hierarchical structure, headed by the professor of the moment. The following interviewee reports the difficulties to publish, to become a professor and to work in management positions in an endogamous world, in which the favoritisms predominate:

I start to publish when I get to have absolute independence, and when I get to have absolute independence is when I'm holder, I mean, before, it was very difficult because they prevented me from using the laboratories, eh, and I had all the P.A.S against, eh, or in favor of the professor, in other words not against me, I suppose not, but obviously they did nothing. (...) I came here to work, I got to come in a New Year's Eve because a P.A.S told me that day he could help me because they would not catch us, because no one would come (...) former professors from the beginning occupy positions, voted and controlled the vote. Let's see, in the endogamous world of the College of Medicine and Law, endogamous was not just because they put their children, because in my department I got to have five family members within the Department Council, eh, and it was endogamous because they put digitally whoever they wanted to put, so all

those people who owed their position to the Professor were confirmed votes for the election. So it was impossible to eliminate it (Constanza).

The other case is the one of a professor, of the most productive teachers, who reached a saturation limit at work. It is about a divorced woman with 2 (two) children, very independent, who created alone her own research group and has more than 6 (six) scholars at her disposal. However, she says her work pace is what caused her to fall into a big depression, which paralyzed her scientific career. She commented as follows:

I like, or I liked it. I'm a little tired. I'm a little exhausted, I'm a little losing motivation because I believe it was also too much effort. Then comes a time when I say, look, I am fifty-two years eeehh, I would like, I'm the one who knows, to get home at six, I go to the gym from nine to ten. I'd like to go to the gym on regular time or go today in the afternoon. Look, it is five o'clock, what a good afternoon, I hang out along the beach, you see?, I'd like to live life a little, because I had no time to live it (Azucena).

3.3 Other Aspects to Consider

All the interviewees have a housekeeper who is responsible for carrying out the tasks of their homes and to take care for their children. This is a key factor that released them from family obligations. One can speak therefore of privileged women who focus all of their energy on only one task, the work as a teacher and researcher. For this reason they are only 4 (four) the women who consider the motherhood and the children as an obstacle to produce articles.

On the other hand, many interviewees of the most productive work 9 (nine) hours a day or more. However, half of the least productive teachers follow a schedule only in the morning. This allows glimpsing higher dedication to work from the teachers with the highest number of articles. This time factor has also resulted in a greater or less familiar dedication. The teachers with fewer than 10 (ten) articles employed more hours in living with their children. Some of them highlight the anguish experienced with the inability to be with them and with the resignation of having more children because they could not devote to them all the time they wanted. One interviewee relates this idea to the gender factor and highlights that this feeling is

innate to the woman, questioning whether a man can indulge in equal conditions to the care of children and the household:

Although we want equality, eh, this is something that we will never get, the fathers leave, calmly, eee, the father of my daughter, I can tell you that is an exceptional father, it never occurred to him having to stay. I suppose now after insisting so much, because at the end they say, or I do or I fight, but I do not believe it's something, I do not believe it will be born on them, I cannot believe it because it is something that we take, I do not know on which gene it is, but it is there, then I, my anguish, leaving my daughter, I do not believe that it happens to any man, you know, I do not believe, I do not believe it (Silvia).

Continued, some interesting phrases were rescued from the most productive teachers, in which it is evident that their lives were centered on the job:

I never believed that the amount of hours was an important factor in the relation with the children, but the quality, the only thing that I tried is that when a child of mine needed me, well, in that case my son was the first, but I did not consider necessary to come home at five because my son needs me (Faustina).

We devote many hours, many, many hours to research, many and now eehhh, I think they were too much, because, for example, the time back home eight, eight and a half, you came, the tasks of thy children, the dinners... but at these moments I think, well, well maybe I took them a few hours that were theirs (Violet).

The memory of my children when small is almost all the weekends in college, changing 'bottles of flies' (Theodora).

In both groups it was showed a double standard that makes them suffer constantly. When they are with their kids they think that they would have to be working. And when they are working they think they should be with their children. Quotations from two interviewees appearing below indicate a sense of guilt.

Talk from a teacher with more than 10 (ten) scientific articles:

Having the feeling that everything you did badly, because I know, and the children were still nineteen months, eee, it's complicated, but good, soon abandoning, not doing one hundred percent as you want neither of both things, but good, sleeping little, going on a hurry everywhere, a little bit like all mothers, I think we all have this feeling of guilt, that sometimes you let children who are ill at home, ee, other times because you did not do the experiment you had to do because it would take you ten hours, and you could not be more than seven, or things like that, anyway (Marina).

Talk from a teacher with less than 10 (ten) scientific articles:

That's one thing I remember a French girl told me: you will always have, she told me, as we all have the feeling of guilt. She said, when you are in

your home, you feel guilty because you are not working and when you are working you feel guilty because you're not at home. And it is true, for my whole life, for my whole life I remember that (Aida).

The teachers of both groups received support, independent of having been from companions or partners. They all say that there are no differences at the moment to produce among men and women, in other words with work and dedication, both are on equal conditions to produce scientific articles. They do not think, therefore, that man is more capable than women. Nevertheless, there are many professionals that highlight that the spheres of power are still dominated by men. This is reflected in the speech of the following person:

Yes, it is true that soon you go to meetings with senior positions and they are all men, here there is no woman, you know? This keeps happening in my world of dentistry, you go to a conference and professors are men, the ones who are moving are all men, but I think it will be changing [...] (Esther).

The several interviewed teachers believe that it is only a matter of time to the domain of the man over the woman ends and gradually the ascension of women to higher positions occurs within the university hierarchy. The explanation is that, at present, there are more women than men in university studies in the area of Health Sciences:

That they are, for many years have been, of course, and if now we're going up, well, I do not know, in medicine come more female students than male ones, in a few years, I hope they publish more. I do not think that they will continue in the positions of power (Sonia).

In the society there are class divisions, gender divisions, and in the case of the university, divisions of power that generate inequality. There are people who have access to certain positions easier than others. As the following interviewee states: you cannot reach to a particular management position and direction, which they gave you, if you do not generate confidence in the person who offers:

I can never be a secretary of department while Dr. Eduardo do not leave the post of department director, because it is a confidence position. As it is the one of the vice-dean, you need to enter in the hierarchical establishment of the university (Juana).

It also appears the awareness that the women have to work harder than a man to be recognized. Even so, there is also the feeling that men support each other. For the men it is irrelevant that another man ascend, while a woman prefers a man to

be the one who grows professionally than a woman. The explanation that the following interviewee gives is purely gender. A man looks great as a university professorships, because he has to support his family, while a woman is perfect as full professor, because she can do her household chores:

Support in the level of the university professorships, the university professorships prefer that Mr. So So, being an uncle, becomes a university professorships before than an aunt. With equal curriculum. They always give preference to the man. Because he has to keep the house, because they have children, whatever. For the women it's like, good, already, and besides, being full professor a woman is perfect because then she can make the housework (Azucena).

Finally, when asked what could be done to increase the scientific production of the female university professors, they propose in the following order of priority: Creating nurseries inside the university, making things easier in teaching and research, facilitating the work as a tool on itself to produce more, increasing the number of assistants to work in the laboratories, having a group of productive scholars, reducing the working hours of the women or make it more flexible to reconcile their personal life and care with the children, not having children and having a loving companion in the same work area.

4 DISCUSSION AND CONCLUSIONS

We must consider that all those interviewed, except one with 30 (thirty) years old, were born in an era marked by the post-war and the military dictatorship of the General Francisco Franco, in which the education was restricted to a high social class. The promotion of the education and culture, defended by the Second Republic, had lost strength along with the ideological pluralism, the religious freedom and the respect to the law equal for all. The Franco Regime placed the church in a privileged place, recognizing it, and even increased the rights which that institution had traditionally enjoyed in the field of education and the moral and ideological control of the society (SÁNCHEZ, 2003).

The profile of the female university professors in the field of Health Sciences is composed by people who meet the same standard. In general, women who come from some high social or medium high classes, who graduated in private colleges,

where it was very present the Catholic religion, and they were economically supported by their parents. Only exceptionally, some scholarship fulfilled the role that in most cases, the family played.

On the other hand, to count on a stable husband or partner in the same academic scope and even belonging to the same department seems to be decisive at the time to make a difference between the most productive teachers and the least ones. None of the University teachers, with less than 10 (ten) articles counts on an affective support, with which she had shared the same line of research over a long period of time.

One should also consider the variant gender. Seven of the most productive women formed a research team with a man (her husband or stable partner) and scholars who they coordinate. Therefore, it is not about working groups coordinated exclusively by a woman. This, added to her small presence in positions of power, management and direction (UNIVERSITAT..., 2007), explains why, the woman still appears as author in less research articles than man (ALONSO et al. 2008).

Nevertheless, a good start in the research is a factor that relates to a high productivity. The indicator is that the teachers, who now produce more, are the ones who at the time of publishing their thesis counted on a higher number of scientific articles.

The main difficulty in publishing, according to the interviewees, is the bad working environment. They are many who admit working or have worked in a bad context, and some recognize explicitly that this harmful situation slows their productivity. If several respondents commented on the hierarchical structure which they had to pass, at the beginning of their career, now the trend seems to be enjoying the consequences of a tough competitiveness on which everything is valid.

The other reasons that have been exposed as obstacles to the scientific production were: the difficulty obtaining research projects and publishing in certain areas of knowledge, having to reconcile the teaching tasks with the research or with the hospital care, and at last, with the motherhood and dedication to the children. It is necessary to highlight that the most productive teachers are those who count on the strongest research teams and the ones who have the possibility to develop more research projects. All of them, mainly the most productive ones, have an intense

working schedule. However, it has been easier to these ones to reconcile the personal life with work, because they get external help or from their families to carry out household chores and the child care. Although, many of them say they to experience a sense of guilt, for not being able to perform the two most important tasks of their lives at the same time, in other words, to take care for their children and the performance of their profession. That's why they suggest the creation of nurseries inside the university as the main way of promoting scientific activity.

REFERENCES

ALONSO-ARROYO, A. *et al.* Análisis de género de los trabajos publicados en la revista *Actas Españolas de Psiquiatría* (1999-2006). **Actas Españolas de Psiquiatría**, v.36, n.6, p.314-322, 2008.

ÁLVAREZ-RICART, C. **La mujer como profesional de la medicina en el siglo XIX**. Barcelona: Anthropos, 1988.

ARRANZ-LOZANO, F. Hombres y mujeres en el profesorado: Un análisis de género. In: GARCÍA DE LEÓN, M. A.; GARCÍA DE CORTÁZAR, M. (Eds.). **Las académicas: profesorado universitario y género**. Madrid: Instituto de la Mujer, 2001. p.337-404

ARRANZ-LOZANO, F. Las mujeres y la universidad española: estructuras de dominación y disposiciones feminizadas en el profesorado universitario. **Política y Sociedad**, v.41, n.2, p.223-242, 2004.

BALLARÍN, P.; GALLEGO, M. T.; MARTÍNEZ, I. **Los estudios de las mujeres en las universidades españolas - 1975-1991**: Libro blanco. Madrid: Instituto de la Mujer, 1995.

BLASCO, T.; OTERO, L. Técnicas conversacionales para la recogida de datos en investigación cualitativa: La entrevista (II). **Nure Investigación**, n.34, p.1-6, 2008.

BORDONS, M. *et al.* One step further in the production of bibliometric indicators at the micro level: Differences by gender and professional category of scientists. **Scientometrics**, n.57, p.159-173, 2003.

ETAN. Science policies in the European Union. **Promoting excellence through mainstreaming gender equality**: Report. Brussels: European Commission, 2000. 157p. (ETAN Expert Working Group on Women and Science) Available: <ftp://ftp.cordis.europa.eu/pub/improving/docs/g_wo_etan_en_200101.pdf>. Access: Oct. 26, 2012.

FLECHA-GARCÍA, C. **Género y ciencia**: A propósito de los «Estudios de la mujer» en las universidades. **Educación XXI**, n.2, p.223-244, 1999.

FUNDACIÓN ESPAÑOLA PARA LA CIENCIA Y LA TECNOLOGÍA. **Mujer y Ciencia**: La situación de las mujeres investigadoras en el sistema español de ciencia y tecnología. Madrid: Fundación Española para la Ciencia y la Tecnología, 2005.

GARCÍA DE LEÓN, M. A. Las científicas sociales en España: Una investigación-acción. Instituto de la Mujer, 2007. Available:
<<http://www.igualdad.us.es/pdf/Las%20cient%3%ADficas%20sociales.pdf>>.
Access: Oct. 26, 2012.

GARCÍA-FERRANDO, M.; IBÁÑEZ, J.; ALVIRA, F. **El análisis de la realidad social**: Métodos y técnicas de investigación. Madrid: Alianza, 2000.

GONZÁLEZ-ALCAIDE, G. *et al.* Análisis de género de la producción científica española sobre drogodependencias en biomedicina: 1999-2004. **Adicciones**, v.19, n.1, p.45-50, 2007.

GUIL-BOZAL, A. Mujeres, universidad y cambio social: Tejiendo redes. In: JORNADAS DE SOCIOLOGÍA, 1., 15-16 junio, 2005. **Anales...** Sevilla: Centro de Estudios Andaluces, 2005.

IZQUIERDO-BENITO, M. J. **Cuidado y provisión**: El sesgo de género en las prácticas universitarias y su impacto en la función socializadora de la universidad. Instituto de la Mujer, 2008. Available:
<<http://www.igualdad.us.es/pdf/cuidado%20y%20provisi%C3%B3n.pdf>>. Access:
Oct. 26, 2012.

MAULEÓN, E.; BORDONS, M. Productivity, impact and publication habits by gender in the area of Materials Science. **Scientometrics**, n.66, p.199-218, 2006.

ORTIZ-GÓMEZ, T.; BIRRIEL-SALCEDO, J.; MARÍN-PARRA, V. **Universidad y feminismo en España (I)**. Bibliografía de Estudios de las Mujeres (1992-1996). Granada, Universidad de Granada, 1998.

ORTIZ-GÓMEZ, T.; BIRRIEL-SALCEDO, J.; MARÍN-PARRA, V. **Universidad y feminismo en España (II)**. Situación de los Estudios de las Mujeres en los años 90. Granada, Universidad de Granada, 2000.

ORTIZ-GÓMEZ, T. **Medicina, historia y género**: 130 años de investigación feminista. Oviedo: KRK, 2006a.

ORTIZ-GÓMEZ, T. (2006b). Las mujeres en las profesiones sanitarias. In: MORANT, I. (Dir.). **Historia de las mujeres en España y en América Latina**. Madrid: Cátedra, 2006b. p.523-546

PÉREZ-SEDEÑO, E.; ALCALÁ, P. La Ley de la Ciencia veinte años después: ¿dónde estaban las mujeres?. **Revista de Investigación en Gestión de la Innovación y Tecnología**, n.46, 2006. Available: <<http://www.madrimasd.org/revista/revistaespecial1/articulos/perezalcala.asp>>. Access: Oct. 26, 2012.

PUJADAS-MUÑOZ, J. J. **El método biográfico**: El uso de las historias de vida en ciencias sociales. Madrid: Cuadernos Metodológicos; Centro de Investigaciones Sociológicas, 2002.

QUINTANILLA-FISAC, M. A. Mujer y Ciencia: Políticas de igualdad y excelencia académica. **Arbor**, v.184, n.733, p.791-793, 2008.

SÁNCHEZ-RECIO, G. Pasado y memoria. **Revista de Historia Contemporánea**, n.2, 2003.

SANTAMARÍA, C. Las mujeres españolas ante el conocimiento científico y tecnológico. In: PÉREZ-SEDEÑO, E. (Ed.). **Las mujeres en el sistema de ciencia y tecnología**: Estudios de caso. Madrid: Organización de Estados para la Educación, la Ciencia y la Cultura (OEI), 2001. p.41-60

UNIDAD DE MUJERES Y CIENCIA. **Académicas en cifras 2007**. Madrid: Ministerio de Educación, Ciencia y la Cultura (OEI), 2007. p.41-60

UNIVERSITAT DE VALÈNCIA **La Universitat de València desde la perspectiva de gènere**: 2003-2007. Valencia: Servei d'Anàlisi i Planificació (SAP), 2007.

VALLS-LLOBET, C. Desigualdades de género en salud pública. In: JORNADAS DE LA RED DE MÉDICAS Y PROFESIONALES DE LA SALUD, 1. 2001. **Anales...** Madrid: Instituto de la Mujer, 2001. p.15-22

NOTES

¹ The areas of Administration, Education and Social Services is the main source of employment for women.

² In a more concrete, 64.7% of respondents have opined that a woman has more obstacles than a man.

Adolfo Alonso Arroyo
Universitat de València
Departament d'Història de la Ciència i Documentació
Facultat de Medicina i Odontologia
Avenida Blasco Ibáñez, 15
46010 – València
E-Mail: adolfo.alonso@uv.es
Spain

Esperanza Gómez-Guardeño
Universitat de València
Facultat de Ciències Socials
Departament de Sociologia i Antropologia Social
E-Mail: esperanza.gomez@uv.es
Spain

María Eugenia González-Sanjuán
Universitat de València
Facultat de Ciències Socials
Departament de Sociologia i Antropologia Social
E-Mail: M.Eugenia.Bayona@uv.es
Spain

Rafaél Aleixandre-Benavent
Unidad de Información e Investigación Social y Sanitaria (UISYS)
CSIC - Universitat de València
E-Mail: Rafael.Aleixandre@uv.es
Spain