

French men researchers in higher education and their professional representations.

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Abstract

This research will focus on 43 qualitative interviews of PhD students, full professors, associate professors, and post doctorates, all male, of three French higher education laboratories (physics, biology, mechanics). These interviews have been realised during spring and summer 2007: they have been recorded and taped integrally.

How do male researchers describe what is a to be a researcher ? Do they develop and share the same image, the same professional representation ? What is the hegemonic masculinity standard in the technological and scientific fields ? Is this representation challenged by its environment and context? How do French male researchers react to the impact now visible of the Lisbonne treaty ?

A. Presentation of our effective of French researchers

The french research field is divided in three main sectors : Research can be either governmental, either in the business sector, or in the higher education sector. Before even entering, being a so called « researcher » in one of these three possible sectors, male researchers benefit from traditional, cultural, symbolic and though highly gendered facilities in applying in 'excellence' higher education fields in sciences and technologies studies leading to these professions. Faulkner¹ noticed that it was men who took the key decisions in order to shape technology, besides, they encountered in that field greater success than women. The structure of work organization in those technical fields is more pervasive and handfull for men. Technology makes part of men's living, their identities: if it frames what is identified as masculine, it thus definies what is not masculinity, as well². Machines, machinery, technology

¹ Faulkner, W (2000), Dualisms, hierarchies and gender in engineering. *Social Studies of Science*. **30**(5), 759–792.

² Meelstrom, Ulf (2004) Machines and Masculine Subjectivity, Technology as an Integral Part of Men's Life Experiences. In *Men and Masculinities*, Vol. 6, N0 4, 368-382, Sage Publications.

thus become the "symbiotic extension" of men³ and though give us a key entry to understand what is masculinity. Men choosing technological and scientific fields are the heirs of these dominions, and make an acknowledged and expected choice concerning orientation. This field is warmly welcoming men, as it conveys masculine images and representations : homo-social atmosphere, competition, pleasure in « tinkering » with technology and technics.

Secondary education: Male overinvest scientific and technological fields

Where do our French male researchers come from ? Male researchers in technological and scientific fields mainly come from one « excellence way » which is « la Terminale S »⁴. It is not about the initial training, as 45% of the students preparing the S higher education final exam are women. Anyway, men students will specialize in some training mainly leading to research in technological and scientific fields : They are in the majority in S, STI and STL⁵, indeed, the more the field will be about technics and technology, the more men will enter and attend it, and thus become the majority : *terminale S*, a general scientific and technological training presents 55% of male pupils, and *terminale S* added to *terminale STI and STL* presents 65% of boys in its total effective (MEN-MESR-DEPP, *Filles et garçons sur le chemin de l'égalité, de l'école à l'enseignement supérieur, 2010*).

When leaving secondary education, having the same final secondary education exam, male and female students do not attend the same higher education trainings. Following our S male and female students, 29% of the boys, and 18% of the girls will attend scientific preparatory classes⁶, which is the « excellence way » to enter the best trainings in technological and scientific fields (MESR, DGESIP, DGRI, SNES, Students attending primary education in 1995).

³ (Meelstrom 2004,379)

⁴ In the secondary Higher education general curriculum, three possible choices after the first year in secondary high school : L (Literary) ES (Economy and Social) and S (Sciences) : These terminology and curricula appeared through the Secondary High School's 1992 reform: Classe de Seconde was reformed in 1992, Classe de Première in 1993, and finally Classe de Terminale in 1994

⁵ STI, STL : Sciences and Industrial Technologies, Sciences and Laboratories Technologies

⁶ Classes préparatoires aux grandes écoles (CPGE) or *Prépas* literally *Preparatory classes for the grandes écoles*, sometimes nicknamed the "royal way," because it's the way most students get into the most prestigious schools.

The preparatory classes, either in literature, sciences or management (generally two or three years) is the traditional way to enter the most prestigious *grandes écoles*. Most of them are in state high schools; there are a few *private* preparatory classes but they are expensive. Admission in preparatory classes are based on an academic report. Many students register in more than one class to maximize their chance of admission. Some of these classes are very selective and successful at placing students into the top schools.

Higher education

Men seems to spontaneously attend to trainings leading to research scientific and technological fields. Their distribution through reasearch fields different disciplines is quite harmonious, at least not concentrated as women's in a few sectors and disciplines. Boys will observe a wider distribution, having a larger previous sample of choices. They form 77% of the total effective in engineering schools, 66% in sciences and MASS⁷, 64% in economy and AES⁸, 43% in law, 50% in medicine : they represent 50% of third cycle students, 44% of the higher education students. (MESR, DGEISIP, SNES, 2008-2009).

Thesis is a male attribute, considering technological and scientific fields!

Men represents 54% of the Scientific PhD owners (MESR, DGEISIP, DGRI, SNES, 2007).

Having a thesis is usually leading to the research field : we can here notice than even if women were in the majority in two sectors considering higher education, (pharmacy and human sciences), the obtention of a thesis does not obey to the initial number law : in 1999, 51% of the human sciences and humanities PhDs were obtained by women, whereas they're representing 60% of the PhD level « Literature and human sciences » students⁹ ! Men are in the majority concerning PhD in all disciplines and a few fields show them concentrating, as mathematics and informatics, physics and engineer sciences, and earth sciences). Concerning fondamentale sciences and its applications, men represents 71% of the L level, 74% of the M level, and 72% of the PhD level . Considering biology, men represents 38% of the L level, 43% of the M level, and 47% of the PhD level ! Considering medicine and onthology, they represents 34% of the L level, 48% of the M level, but 51% of the PhD level ! (MESR, DGEISIP, DGRI, SNES, 2008).

Male French researchers : an omnipresence through three levels : by sector, by discipline, and by job position level.

French researchers represent 240 186 persons, among them, 73%,33% are men. Our three sectors present a different distribution of researchers : the business sector attracts 44,18% of the French researchers, the higher education one concentrates 44,97% of them, and the

⁷ MASS : Applied Mathematics and Social Sciences, at university.

⁸ AES : Administration, Economy and Social, at university.

⁹ Livre blanc (2002), *Les femmes dans la recherche française*, Ministère de la recherche.

governmental sector only 10,85% of the total effective of french male and female researchers.

Masculine effective.

The masculine effective is in a very high proportion in the business sector : (79,69% of the effective) and concentrate 49,33% of our « total French male researchers ». Only 10,33% of our « total French male researchers » works in the governmental sector, but they represent 88% of the effective in the governmental sector. 38% of our « total French male researchers » enter the higher education sector, and their effective reaches here 65,88% in this sector.

Figure 1. Men researchers are in the majority in the three sectors and considering the total number of French researchers.

French researchers	Higher Education (45,51%)	Gov (10,98%)	Bus (44,71%)	TOTAL
Women	34 835	8 449	21 813	66 713
Men	67 275	17 927	85 588	173 473
TOTAL	102 110	26 376	107 401	240 186

She figures 2006, Women and Science, Statistics and Indicators (2006), European Commission Directorate-General for Research, Science and Society.

Men researchers are in the majority in all disciplines as well.

Men are in the majority, all disciplines taken altogether ; their distribution remains quite harmonious, and generally, widely outnumbers women. Even for the fields where female students were in the majority, the gap is now highly visible between the initial number considering male and female students, the effective obtention of the PhD, and the effective researcher position.

She Figure 2006 and 2009 couldn't give us correct numbers considering french researchers and their distribution through scientific and technological disciplines. Considering higher education, figures from 2000 (*Livre blanc (2002), Les femmes dans la recherche française*, Ministère de la recherche) shows 58% of men researchers, in human sciences disciplines, 59% of men researchers in earth sciences disciplines, 71% in social sciences disciplines, 74% in chemistry, 77% in medicine, 79% in mathematics, 80% in physics...

Men researchers are in the majority in A positions.

The glass ceiling effect and impact is quite visible in our three research sectors and fields. It has different impacts : A B and C positions presents high dissimilarities considering their attribution between men and women researchers. Administrative boards, management positions, decisional instancies present men in a majority. Men overinvest in such powerful positions, possessing key positions, thus deciding and applying key decisions considering organisation of the research, and its evaluation.

Even if we can notice some disparities between disciplines, men researchers have always the advantage. Considering the higher education sector, the mathematics discipline, 39% of the male researchers presents the A level (20% of the women). In physics, considering the A level, this is 44% of the men, 21% of the women (chemistry, 43% of the men, 18% of the women, human sciences, 38% of the men, 21% of the women) *Livre blanc 2002*, (2002) *Les femmes dans la recherche française*, Ministère de la recherche.

Governmental research presents the same dissimilarities and masculine advantages. Considering the A category, the CNRS¹⁰ presents 45% of its total male researcher effective, and 27% of its female effective. The INSERM¹¹, 48% of its total researcher effective, but 30% of its female researcher effective are A. INRA¹² presents 51% of its total male researcher effective, only 15% of its total female researcher effective in the A category.

Men, as students, and later, as researchers, seem to spontaneously reach researcher positions, and high status in technological and scientific fields. They distribute themselves hamoniously through disciplines, but concentrate in acknowledged « excellence » scientific disciplines, as mathematics, or physics. Gendered criteria facilitates their ways towards scientific and technological higher education trainings leading to the research sector. Once in the effective position of a researcher, they overinvest powerful positions, and become stakeholders in their own field.

¹⁰ <http://www.cnrs.fr/>

¹¹ <http://www.inserm.fr/>

¹² <http://www.inra.fr/>

B. Images and self gendered representations of researchers in France :

Connell, in *Masculinities*¹³, introduces the concept of 'hegemonic masculinity' which is « *not a fixed character type, always and everywhere the same. It is, rather, the masculinity that occupies the hegemonic position in a given pattern of gender relations, a position always contestable*¹⁴ »

Following Connell : *The concept of 'hegemony' deriving from Antonio Gramsci's analysis of class relations, refers to the cultural dynamic by which a group claims and sustains a leading position in social life. At any given time, one form of masculinity rather than others is culturally exalted. Hegemonic masculinity can be defined as the configuration of gender practice which embodies the currently accepted answer to the problem of the legitimacy of patriarchy, which guarantees (or is taken to guarantee) the dominant position of men and the subordination of women.*

*This is not to say that the most visible bearers of hegemonic masculinity are always the most powerful people. They may be exemplars, such as film actors, or even fantasy figures, such as film characters*¹⁵.

We will use Connell's 'hegemonic masculinity' definition in its cultural dynamic reacting towards a 'given pattern', an assessed ideal type standard and gendered model claiming its powerful position. French male researchers, answering to questions concerning their professionalism, gave answers and draw images of what is a researcher, what is to be a researcher. They developed powerful images, positively gendered representations of their professionalities. We will though rather use 'Hegemonic masculinity' as a standard, a representation, a common image of what is to be a researcher, and what is a researcher shared by our french male researchers.

Masculinities, researchers, and 'hegemonic masculinity'

« *Western science and technology are culturally masculinized. This is not just a question of personnel, though it is a fact that the great majority of scientists and technologists are men. The guiding metaphors of scientific research, the impersonality of its discourse, the structures of power and communication in science, the reproduction of its internal culture, all stem from the social position of dominant men in a gendered world*¹⁶ ».

Focusing on men's discourse concerning professionalities, and being a researcher, one model,

¹³ Connell, R.W (1995) *Masculinities: knowledge, power and social change*, University of California Press.

¹⁴ (Connell 1995,76).

¹⁵ (Connell 1995,77).

¹⁶ (Connell 1995,6).

or standard seems to gather all our interviewed researchers, olders, yougers, PhDs, Post doctorate, B and A researchers : a passionate man, working all day long, and all night long, a conqueror of new scientific spaces, despising money, looking for glory :

1DDc1 : What's appealing to me, it this discovery spirit, trying to work on subjects that haven't been explored, to be explored... 3MC2 : I would say... It's a job which allows you to see new things daily !... to do experiences, calculations, unobserved prospectives...

3MC3 : There is an explorator, an exploratory side... The explorator side who risk himself on new lands, the paper you're writing will be written for ever, and used by others !

Criteria of gathering around a researcher idealised, passionated, highlighted by its daily research build a community of men researchers, all appealing to its same standard . It is surprising how this standard ideal type of researcher is presented in a so positive way : MOTIVATION research project¹⁷ presented a negative image of sciences and scientifics among French teenagers¹⁸.

This ideal type standard doesn't seem to meet any boundaries, any social and economical context. It is thus challenged by another ideal type standard, highly influenced and molded by contemporary context of economical crisis and highly competitive. The second standard appeared jointly to the Lisbonne treaty, and its impact on the research European field.

The Lisbonne Treaty (March 2002) states that : *Article 179 (ex Article 163 TEC)*

1. The Union shall have the objective of strengthening its scientific and technological bases by achieving a European research area in which researchers, scientific knowledge and technology circulate freely, and encouraging it to become more competitive, including in its industry, while promoting all the research activities deemed necessary by virtue of other Chapters of the Treaties.

2. For this purpose the Union shall, throughout the Union, encourage undertakings, including small and medium-sized undertakings, research centres and universities in their research and technological development activities of high quality; it shall support their efforts to cooperate with one another, aiming, notably, at permitting researchers to

¹⁷ www.motivation-project.com/

¹⁸ see Pinault, Cloé (2009), Open gates, closed gates – mathematics and sciences in secondary education in France. In: *Daniela Freitag, Bernhard Wieser & Günter Getzinger (eds.) Proceedings 8th Annual IAS-STC Conference on Critical Issues in Science and Technology Studies*. Graz: CD-Rom. ISBN: 978-3-9502678-1-5. Download: [http://www.ifz.tugraz.at/index_en.php/article/articleview/1817/1/58\[28.10.2009\]](http://www.ifz.tugraz.at/index_en.php/article/articleview/1817/1/58[28.10.2009])

*cooperate freely across borders and at enabling undertakings to exploit the internal market potential to the full, in particular through the opening-up of national public contracts, the definition of common standards and the removal of legal and fiscal obstacles to that cooperation*¹⁹.

Competitiveness, effectiveness and benchmarking

Reacting to the impact on the research organisation, impelled by the Lisbon European Treaty, new criteria of evaluation were created, and new management styles appeared in laboratories. Competitiveness, concurrency, evaluation of competencies, benchmarking, management techniques inherited from other fields, quantifications, increasing of criterion measuring effectiveness of measures impacted on French researchers, and created a new standard : the researcher-entrepreneur²⁰. This ideal standard type is thus more cynical, more « warrior » than the former standard ; it reflects more inter generations and organisational breaking ups : this standard will create different types of professionalities, all referring more or less to this « researcher- entrepreneur ». We must admit that this standard concerns more younger researchers, right struck by economical crisis and budget strictness context.

Answering to : Do you have a career plan ?

1PDoC1 : The ANPE²¹. ANPE functions quite well in this period, peculiarly in my field.... It's reality, we're urged upon very long studies, with high prestigious trails... I always had an exemplary scholar trail, but the way out is fully obstructed ! The only possibility is to go in another country. This is the brain escape that everybody knows about

3PDC1 : A career plan ? Oh no, I'm too old, it's over... When you get more than 32 or 33 in science, it's over ! But as I like it, I will do another Post doc ! I call that scientific mercenaries...

1PU1 : Ah, concerning me, my career is right behind me ! But at the beginning, no. I would say, it's a period. When I began to do research, career was a minor idea ! Celebrity was the real thing ! Money wasn't interesting at all, it's not anymore the purpose.

The « researcher-entrepreneur » is a standard which is more linked to « all masculinity standard ever » : in a crisis period, the research sector began more competitive, and harder to enter in for

¹⁹ <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:C:2008:115:0001:01:EN:HTML>

²⁰ Bruno, Isabelle (2008) *A vos marques, prêts... cherchez! La stratégie européenne de Lisbonne, vers un marché de la recherche*, Paris, Editions du croquant, collection Savoir/agir.

²¹ ANPE : National Agency For Employment.

everybody, peculiarly men non applying to a more « warrior » standard ideal type of professionalism , and it is illustrated by the distress of many researchers interviewed, in any positions :

1D3. Do I have a career plan ? I don't know if it's a career plan or a dream career plan !

2D2. I would really love to have one, I would like to be an associate professor, I would like to !

3D1. No. I don't have any career plan. I will go wherever they want me, to be somewhere, and eat.

3MC2. I would answer yes and no. No, because I do not daily ask myself this question, I don't peculiarly want to be in a higher position, i'm not too much interested. But on the other side, this is what the society expect from you : to have your habilitation ! It get sense !

This standard is not commonly presented as negative, or positive : it shows clearly the differences between researchers, their positions, their situations in the team, their handling of competitiveness, national, and international one. This standard thus presents a multiplicities of professionalities, closely linked to the economical context, the position (effective or not) of the researcher, the way he feels about competition and new management styles. This upcoming second standard « warrior » « Chercheur-entrepreneur type is hardly challenging the former representation of the researcher, between the *Tournesol* of Hergé, and a conqueror, an explorer. The former one, the *Tournesol* type, was more harmonious, and did not reflect individualities, it was more a collective standard, shared by everybody.

We believe this second standard, tougher, is closer to masculinity's criterion of competition, rationality, effectiveness : the gendered image of a researcher, of a male researcher may be strenghtening, becoming harder, and rejecting more men who do not correspond to this standard, and women as well.

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[http://www.ifz.tugraz.at/index_en.php/article/articleview/1817/1/58\[28.10.2009\]](http://www.ifz.tugraz.at/index_en.php/article/articleview/1817/1/58[28.10.2009])

She figures 2006, Women and Science, Statistics and Indicators (2006) European Commission Directorate-General for Research, Science and Society.