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Gender and the attraction for IT in career paths: a French study

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ABSTRACT

Different feminist theories have endeavored to explain the relationship between masculinity and technology. However, most of these theories focus on women's under representation, and little attention has been paid to women who are attracted by technology. This communication describes an exploratory study carried out in an IT company located in France. We based our research on Hennion's theory of taste as a practice, and we conducted nine semi-structured interviews with male and female IT professionals (IT architects, managers and consultants). Textual analysis and structural analysis have provided the following results: Most interviewees share an attraction for IT because of the ever-changing nature of IT and the diversity of their jobs. However, some differences were clearly expressed; male interviewees assume a hedonic posture, whereas women emphasized the empowerment they feel through mastering technology. Social recognition in the workplace appears to play a major role for women in pursuing a technical career.

Keywords

Gender, IT attraction, performance, women's under representation, recognition.

INTRODUCTION

Under representation of women in IT is a complex issue which has given rise to a considerable body of research. Since the early eighties, government measures aimed at attracting female students and professionals to the IT industry have met with little success. Three dominant theories in gender literature have endeavored to explain the relationship between gender and technology. However, they mainly focus on women's withdrawal from the field, and little attention has been paid to women pursuing IT careers. The research presented in this communication is directed at exploring the ways successful IT professionals (both male and female) perceive their relationship to technology. We first summarize the different theoretical trends and position our research in this framework. Then, the qualitative survey and methodology are described. The analysis of the data is based upon the idea that taste is experienced and nurtured by actions, as described by A. Hennion in his theory of taste as a practice [Hennion, 2004]. The third section summarizes the main features of Hennion's theory, which is based on the analysis of the behavior of music lovers. We adapted this theoretical framework to explain the attraction for IT that the professionals expressed during the interviews. Lastly, the results of our analysis from a gender point of view are presented.

1. THEORETICAL BACKGROUND

Three theories in gender literature are used to explain the under representation of women: ecofeminism, liberal feminism and technology as culture [Gill-Grint, 1995a, 3]. They can be represented in a two-dimensional framework. First, the "gender of technology" which opposes those who defend the idea of a male gendering of technology and the tenants of technology as neutral. The second dimension identifies two opposing opinions of the origin of the masculinity/femininity dichotomy, those who believe it is rooted in biology and those who view this opposition as culturally constructed. The three theoretical trends favor different attitudes towards technology (Fig.1).

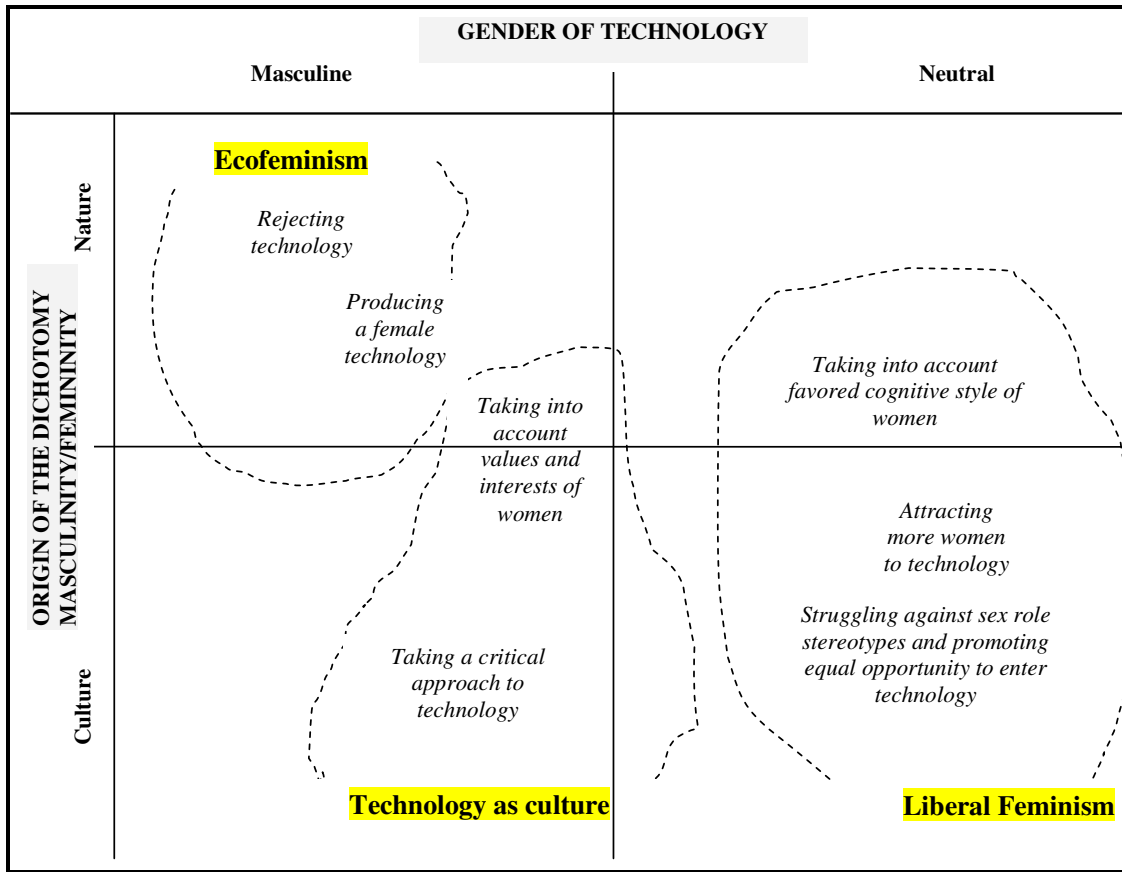


Figure 1: Main theoretical trends

1.1 Ecofeminism

Ecofeminism [Mies-Vandana, 1993] is closely related to the feminist movements of the seventies which rejected the ideology of patriarchy, that is the hierarchical opposition between, on the one hand man-mind-culture and on the other woman-body-nature. According to this theory, technological objects are masculine; they have been designed by men, and they are aimed at controlling nature. The core recommendation for women is to retreat from technology, and possibly to develop “feminine technologies”. Two main criticisms have been raised against ecofeminism. Firstly, the diversity of behavior and meaning associated with femininity and masculinity across time and place puts into question the validity of the concept of a universal essence of femininity and masculinity. Secondly, according to many feminist writings, the association between women and nature has frequently been used to reinforce the domination of men over women.

1.2 Liberal feminism

Liberal feminism is based on two basic assumptions, men and women share the same capacity for rational thinking, and technology is neutral. Women are seen to be discouraged from technological careers because of sex role stereotypes. This theoretical trend has inspired most equal opportunity programs which have aimed to attract women into science and technology. The first campaigns in the eighties aimed at modifying women’s perceptions, whereas succeeding campaigns focused on social issues, mainly education and recruitment [Hodgkinson, 2000]. Within liberal feminism writings, one may sometimes encounter references to nature. For example [Turkle–Papert, 1990] and [Crutzen, 1997] argue for a plurality of approaches in teaching and dealing with technology, to take into consideration women’s interests. Liberal feminism has been questioned because of the limited success of the programs for attracting women that were based on their analyses. The main criticism is that technology is left outside the theoretical developments, the major focus being on women’s deficiency caused by social representations.

1.3 Technology as a masculine culture

The core idea of this theoretical position is that women's under representation in technology is the result of its historical and cultural construction as a masculine domain. Technological objects do not stand alone; they are part of a culture. Technology as a masculine culture takes into account stereotypes and representations of technologies associated with hegemonic masculinity [Donaldson, 1993] as does liberal feminism, but other dimensions of culture are also considered [Faulkner, 2001]. Historically, technology has been constructed as masculine; women were denied access to technical tools or weapons [Tabet, 1982]. Thus, technology has become part of gender identity. Being close to technology participates in the construction of masculine identity, whereas women who exhibit a lack of technical competence may do so in order to appear as "real women". From this point of view, gender is a performance, a doing more than a being [West-Zimmerman, 1987]. The limited success of programs aimed at encouraging women in IT can thus be explained by women's active resistance, because such a choice could raise suspicion concerning their female identity [Wacjman, 1991].

According to some authors, technical objects are gendered because they have been designed by men according to their own interests and value. This viewpoint, surprisingly not far removed from ecofeminist discourse, has been criticized for several reasons. It presupposes two separate communities sharing similar interests and values, a community of men and a community of women. This notion of community has been put into question namely by [Butler, 1999]. Moreover, it is important to remember the seminal work of female pioneers in IT who made important contributions to the computer science field [Gürer, 1995]. Their achievements could hardly be labeled as masculine or feminine. However culture sometimes clothes technical objects with gender, for example, certain terms used in the field of programming illustrate this: killing or aborting a program, a deadly embrace, etc [Grundy, 1996, ch.7]. Finally, [Grint-Gill, 1995] have pointed out that a simplistic interpretation of the performative role of technology in the building of a gendered identity can reinforce stereotypes. If dealing with machines is considered as masculine, women in technical careers are transgressing.

1.4 Research objective

A large number of men lack technical competence; however this does not prevent them from being accepted socially. Thus as [Wacjman, 1991, 159] said, "The correspondence between men and machines is thus neither essential nor immutable, and therefore the potential exists for its transformation". How can research explore the signs of such a transformation? [Trauth-Quesenberry-Morgan, 2004] have underlined that the dominant theories rely on the implicit assumption that men and women differ as a group. Obviously, such an assumption may lead to unconventional behavior being overlooked. The emerging theoretical trend these authors have worked on is based on the idea that cultural and socio-cultural factors could explain individual differences in the career choices of women in the IT workforce [Trauth-Quesenberry-Haiyan, 2008]. We also think that considering women as a group limits the field of research. Our starting point was that some women expressed a personal attraction for technology and did not appear to have gender identity problems. Our objective was to investigate the reasons for choosing their career paths. Thus, we have analyzed the reflexive discourse of IT professionals, and we then tried to see if and how gender was involved in their relationship to technology.

2. METHODOLOGY

Our research is an exploratory qualitative study carried out in an IT company located in France. This company has been actively involved in diversity management for several years, namely in gender action initiatives. Nine interviews were conducted with successful IT professionals (five women and four men), all French natives, with a similar level of education and at least fifteen years of work experience (Tab.1).

Our objective was to understand the personal reasons for being involved in technology. Based on the general approach of technology as a culture, which includes gender as a performance, it is easy to understand why women may avoid technology for fear of being perceived as masculine or because they see it as "the clubhouse" [Margolis&Fisher, 2003]. According to Butler's performative view of gender, masculinity or femininity is not an internal essence, but "is manufactured through a sustained set of acts" [Butler, 1999, preface, XV]. From this point of view, becoming familiar with technology would be considered as challenging gender norms. However, women involved in technology do not all appear to be feminist activists and when questioned they insist upon their attraction to technology. We wanted to take into account their stand.

Because it is a core factor which orients a career path, attraction cannot be simply apprehended as a feeling. The day-to-day work with technology must bring satisfaction in itself. This is why we have considered loving IT under its practical aspect: the taste for IT is expressed and consolidated through activities. We have thus based our analysis of the data upon the theory of the pragmatics of taste [Hennion, 2004]. The author criticizes the traditional sociological approaches which consider that cultural taste is determined only by social factors (class, education, etc.), without taking into consideration the involvement of the persons themselves. He concerned himself with activities touching on cultural interests in the personal sphere where

people are free to choose rather than professional activities where there are more constraints. Nevertheless, our interviewees are in executive positions in a big company environment where they freely chose whether or not to work in technology. This was clearly expressed during the interview sessions. We consider that this freedom of choice legitimizes our applying Hennion’s theory to our study. Based on our interviews, we adapted this theoretical framework to describe IT attraction. We then conducted a textual analysis to investigate differences between participants. Finally, each interview has been analyzed with [Demazière-Dubar, 2004]’s structural method.

Internal code (F female – M male).	Job position	Age	Education
F1	IT architect (generalist)	42	Engineer in Electronics
F2	IT manager	55	Master in Computer Science
F3	IT architect (application)	44	Master of Management
F4	IT architect (ERP)	46	Engineer in Air conditioning systems
F5	IT architect (middleware)	45	Engineer in Telecommunication
M1	IT architect (hardware)	49	Engineer in Industrial Ceramics
M2	IT manager	48	Civil engineer
M3	IT architect (software)	40	Computer engineer
M4	Consultant (ITIL)	50	Master in Information Management

Table 1: Characteristics of the interviewees

3. IT ATTRACTION AS A PRACTICE

3.1 The theory of taste as a practice

The theory of the pragmatics of taste elaborated by Hennion is part of a research tradition called Activity Theory that has been in particular a source of inspiration in the IS field [Kutti, 1991]. In this theoretical approach, taste is apprehended as a form of doing. Appreciating the object of attraction (music) can only be experienced through activities, such as going to concerts, buying records, reading musical journals, etc. The amateur plays an active role involving self-reflection, i.e. he/she can take a critical stance on the satisfaction and pleasure given by the activities, he/she is always testing and experiencing his/her own attachment. These activities involve mediations between the amateur and “doing taste”. [Hennion, 2004] describes four mediations, which can be represented on a diagram (Fig.2). Firstly, “objects which attract” refer to the support materials which participate in doing taste. Loving technology generally refers to certain categories of technical objects which appear attractive to users. Dealing with a sophisticated machine or using complex software can be a pleasure. Secondly, taste is discovered and reinforced by a “community”, other people who can initiate the user, share experience, and be an example or a counterexample. Thirdly, “contexts” refer to situations in which the activities are performed and the tools supporting the activities. There is a large variety of IT activities, carried out with many different conditions (using devices, reading reviews, relationship with clients, colleagues, etc.). The human body, including mind, is transformed by the practice of taste, and becomes more competent and more receptive. Working in IT involves not only an initial education, but also frequent updating which allows one to discover and appreciate novelties.

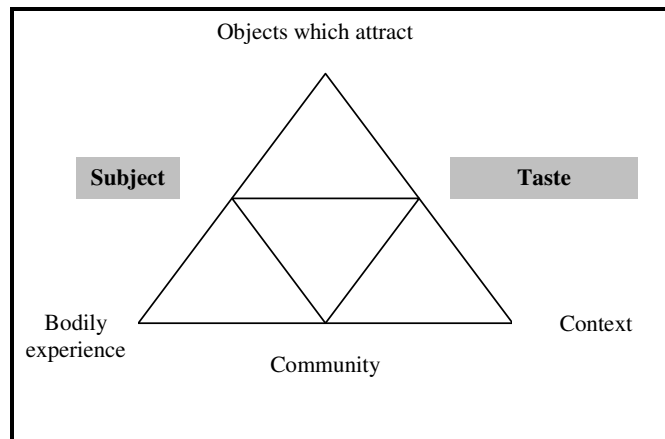


Figure 2: Four mediations for “doing taste”

As an example, hacker culture [Thomas, 2003] could be studied through Hennion’s four mediations. Taking [Håpnes&Sørensen, 1995]’s description of a Norwegian hacker community, we can observe that hackers stick to particular

types of computers or programming languages; they enjoy extreme physical involvement, remain oblivious to their bodies, and work until they drop; programming all night is a favoured context. Also, being part of a specific community, recognizably different (hair, dress, language, etc.), and set apart from mainstream computer culture, increases the attraction.

3.2 Attraction to IT

Coming back to IT professionals, we have used the mediation view to analyze how the interviewees expressed their attachment to technology.

Objects which attract

The relationship with technology is presented as a strong feeling: “It is something I need to do... when I stop, after a while I miss it” (F1); “The world of technology is really exciting” (F2); “I love my job and the tools I am working with” (F4); “I am crazy about science and technology” (M1). Technical objects have characteristics which increase the attraction; they are ever-changing, working with them makes people feel they are on the cutting edge: “I like the avant-garde side of what we do” (F4); “What is really interesting is that I will always be doing new things” (F2); “It is interesting to be in an ever changing job” (M3). Some find an enchanted dimension in IT: “For me it was magical, both abstract and concrete, I was attracted” (M2); “I am most dazzled by the virtual properties of machines” (M1). The concrete aspects of IT were also mentioned. “What I really appreciate is the tangible aspect, being able to see how it works” (F5); “I need to touch software, to see it from the inside” (F3); “Technology is wonderful, you can make it work with little knowledge” (M1).

Community

Meeting people around technology also plays an important part in the attraction. Interacting with persons who share the same technical background is appreciated. “I have to stay in the technology field mainly because I like to work with technical teams” (M1); “I want to stay with technical people because I feel at ease with them” (F1); “I am so happy when I spend weeks working with lab people, with my clients, I love that” (F5). However, interviewees also enjoy interacting with a great variety of people: “When I worked on the e-commerce software, I really enjoyed meeting people at different levels and from different units” (F3); “In that kind of job, you really work with a panel of different persons, it brings a lot” (F4). IT jobs which do not offer the possibility of meeting people do not attract our interviewees. “In developer jobs, you can spend a whole month in front of your computer, without meeting anybody” (F5); “I couldn’t imagine being a developer, it’s like being autistic, or at best very lonely” (M3).

Contexts

In the categories of IT jobs of our participants, two main contexts appear to attract people to technology. The first one is playing a mediator role, which requires understanding the product well and finding the appropriate language to explain how it works to others. “I am a link, an interface between the labs and our clients” (F5). “When you have understood what innovative technology can bring, it is interesting to explain it to others” (M3). “It is very interesting to take a client’s requirement and build a solution that fits” (M2). The second context is that technology is a challenge: “I had to digest an enormous quantity of information and then apply it, but this was partly what motivates me” (M2); “When I started this new job, I had to learn everything about hardware, it was a very interesting time” (F1); “Sometimes, I make complex things, which require hard thinking, I am pleased when it works” (F3).

Bodily experience

An IT job also seems to stimulate the intellect. “New technologies are stimulating” (M3); “As our software had to be constantly updated, we couldn’t possibly get bored” (F3); “I don’t know if this only concerns technical people, but when I stop learning something new, I feel as if I’m going nowhere” (F1). Mastering technology creates a feeling of wellbeing: “Whatever I’m doing, I enjoy knowing that I’m building on a sound technical basis” (F4). “With technology, I know I’m resting on something solid” (F5).

4. GENDER ANALYSIS

Up to this point, we noted a similar attachment to IT from both men and women. They all appreciate the innovative and challenging aspects of information technology. They are often fascinated, in particular because they can investigate how it works. Most of them enjoy both working with technical teams and meeting a variety of people. Technical knowledge, whether it be specialized or not, provides a positive status with non-technical people. Controlling technology is seen as a challenge by most interviewees, thus success brings satisfaction and empowerment. We made two further analyses looking at

gender more accurately.

4.1 Textual analysis

We used the Prospero tool [Chateauraynaud, 2003] to conduct a semi-automated textual analysis of the interviews in order to investigate if and how gender is involved in relationships with technology. We defined categories of words referring to our interpretation of the theory of taste. We then compared men and women’s discourse.

First we note (Fig.3, the two first columns) that men and women refer to similar categories. The category “Challenge” (“being tested”, “difficult”, “hard”, etc) comes out on top for both men and women. Three other categories, although not cited frequently, are significant because they were equally referred to by men and women: “Credibility” (confidence other people have in you), “Work community” (personal relationships in the workplace) and “Attraction” (see third column on the right). The two latter categories confirm the role of the above mentioned mediations in the attraction to IT. However, despite the large number of similarities, there are striking differences; whereas women speak more of “recognition” (Fig.4, right hand column), men mostly refer to “wonder” (marvels of IT) (Fig.5, right hand column). Based on these differences, we conclude that male interviewees assume what we will call a hedonic posture, i.e. they are inclined to speak of the pleasure experienced through IT, whereas women emphasize the importance of being recognized.

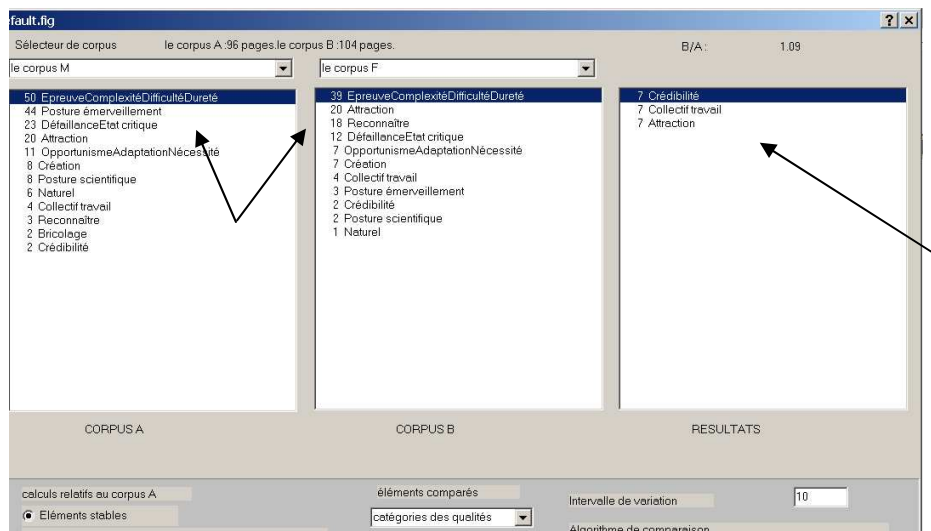


Figure 3: Categories equally referred to by men and women

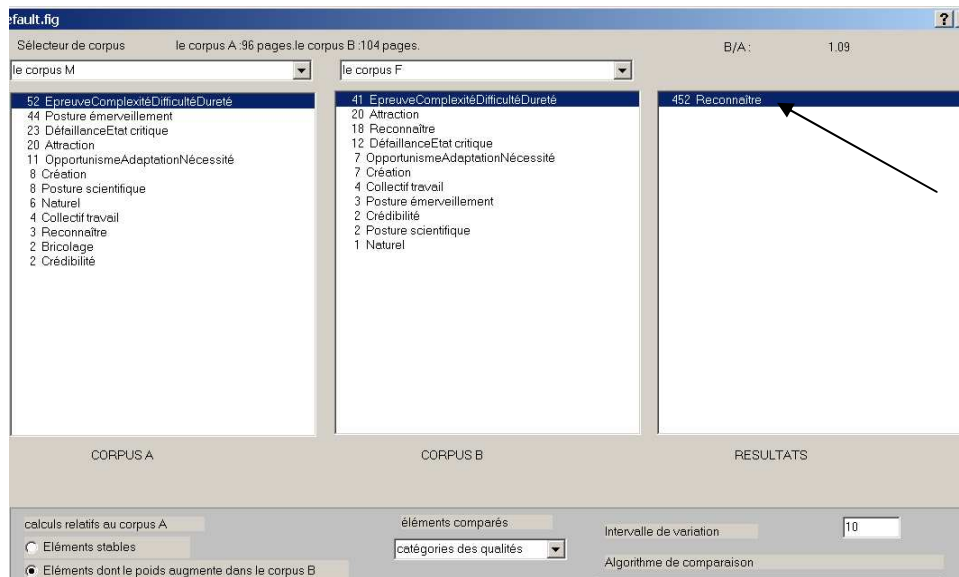


Figure 4: Categories stressed more by women

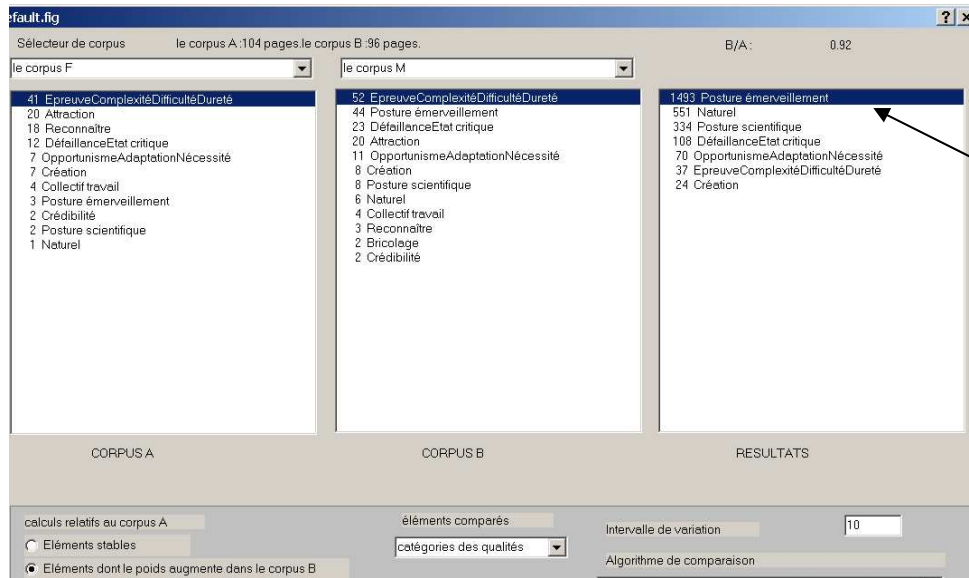


Figure 5: Categories stressed more by men

4.2 Structural analysis

The text of each interview has been divided into small units of three types: "sequences" are textual units in which the speaker gives facts about his/her own life story; "acting" units refer to persons who have played a role in the speaker's life story; "proposition" units include arguments given by the interviewee to justify decisions or opinions. Textual units have then been sorted according to type. "Sequences" give the different stages of the speaker's career. "Propositions" are explored in order to find a structure in the text. This is then represented on a schema (see Appendix). Three results emerged from this analysis.

1. Working with technology: a challenge

Working with technology is seen as a challenging test for both men and women: it can be tough, but success empowers. According to F1, when you do not control all the technical aspects of a technical product, "you feel slightly lost"; as she is now planning to move to a management position, she thinks that maybe she "will be uneasy" because she will not have everything "under control". F4, while admitting that sometimes she likes getting out of all-technical field, adds that she always needs to come back, to "cling to a technical dimension". Successfully dealing with technology is like winning a victory over a competitor or overcoming a great obstacle. During the interview, F2 mentioned fifteen successful projects; she enjoys working with IT, because it is "doing and succeeding". Similarly, F3 explains that it brings her "a lot of satisfaction" when she has done a technical activity and "it works". For M1, a marketer can sell something that the client will never be able to use correctly, whereas in his own job he has to be "concrete" and "realistic". The challenge also includes mastering complexity. M2 finds it very exciting "to start from a client's requirement, to define a solution and to make sure that this solution works well". M3 describes his relationship with technology as "synthesizing the complexity of a particular technology" to provide a clear and simple description of its utility. In the same way, F1 explains: « When I first attended presentations on Java application servers, I didn't understand anything, I felt a bit afraid. (...) That is why I worked hard to simplify the discourse for others".

Being challenged by technology gives the opportunity to become credible, but some gender differences appear.

2. Credibility: acquired once and for all?

Most of the interviewees, if not all, speak about credibility. However, women express the idea that technical skills should always be reinforced and updated in order to maintain credibility with the people around them; whereas men seem to consider that their technical background has definitively provided them credibility. The only exception is M4 whose studies were less technically oriented and as he works mainly with people involved in technical jobs, he tries hard to keep up with innovation: "Actually, I have an obsessive fear of being unable to answer a question". On the contrary, M3 is confident: "My sound technical background has saved me many times; from the fundamental knowledge I have acquired, I have developed analytical skills; this is an important part of my relation to technology". When M2 became a manager, he felt self-assured: "I knew the team's job, thus I was credible". He told us he "keeps one foot in technology" by attending monthly meetings where people share experience on technical subjects. For M1, his attraction to technology is "natural": "I am a born

technician”; from his point of view, “technology is wonderful, because with little knowledge, you can always find your way out”. This view contrasts with F1’s; she feels uncomfortable when she does not understand all the technical aspects of the IT products she works with, even if she mentions that “clients do not feel worried” because they know that “she knows where to get the information”. She still thinks that “understanding well what you are speaking of helps being credible”. F3 and F4 seem to be more openly worried about the client’s opinion. F3 has stayed in a specialized job because “being a generalist meant losing credibility with the client”. For F4, “you aren’t credible if you don’t really understand ERP implementation issues”.

F2 and F5 are higher up in the hierarchy than the other interviewees, and recognition appears to be a key issue.

3. Recognition: a gender issue?

F2 and F5 are very successful IT professionals. They both have a sound IT background, but they have adopted opposing career strategies. F2 has had 15 jobs in 32 years, and she was always willing to accept job opportunities. F5 has been specialized in a mainframe operating system for the last 17 years of her 23 year career. However, recognition holds a very important place in their discourse, and they are the only interviewees who mention reactions concerning their gender. F2 recalls several circumstances where she received recognition: “you are the undisputed leader on the offer you have launched”, “you are a high-level consultant”, “it has been a success”, etc. She also mentions that being a woman was unusual in certain situations: «a female manager in an IT center was a bit...”, “the client told me that it was his first time negotiating with a woman”, “you are my first female manager”. As regards F5, she was told by one “chauvinist boss” at the beginning of her career: “you are a woman, you will never succeed”. Another boss, when she took on a new technical job, asked her to do some assembler programming in order to test her because he did not trust a woman. She finally became the first senior female certified IT specialist in Europe, and she is very proud of it, even if she kept saying that to succeed was not her main objective. F3, though less recognized, has a similar discourse. She has not actively sought recognition, but she still needs to know that she is valued: “sometimes, I do a difficult job, I am glad when it works, (...) and even if my company doesn’t say thank you, if I know that my client is satisfied, that he recognizes me, that is enough”. We noted that no male interviewee mentioned recognition.

CONCLUSION

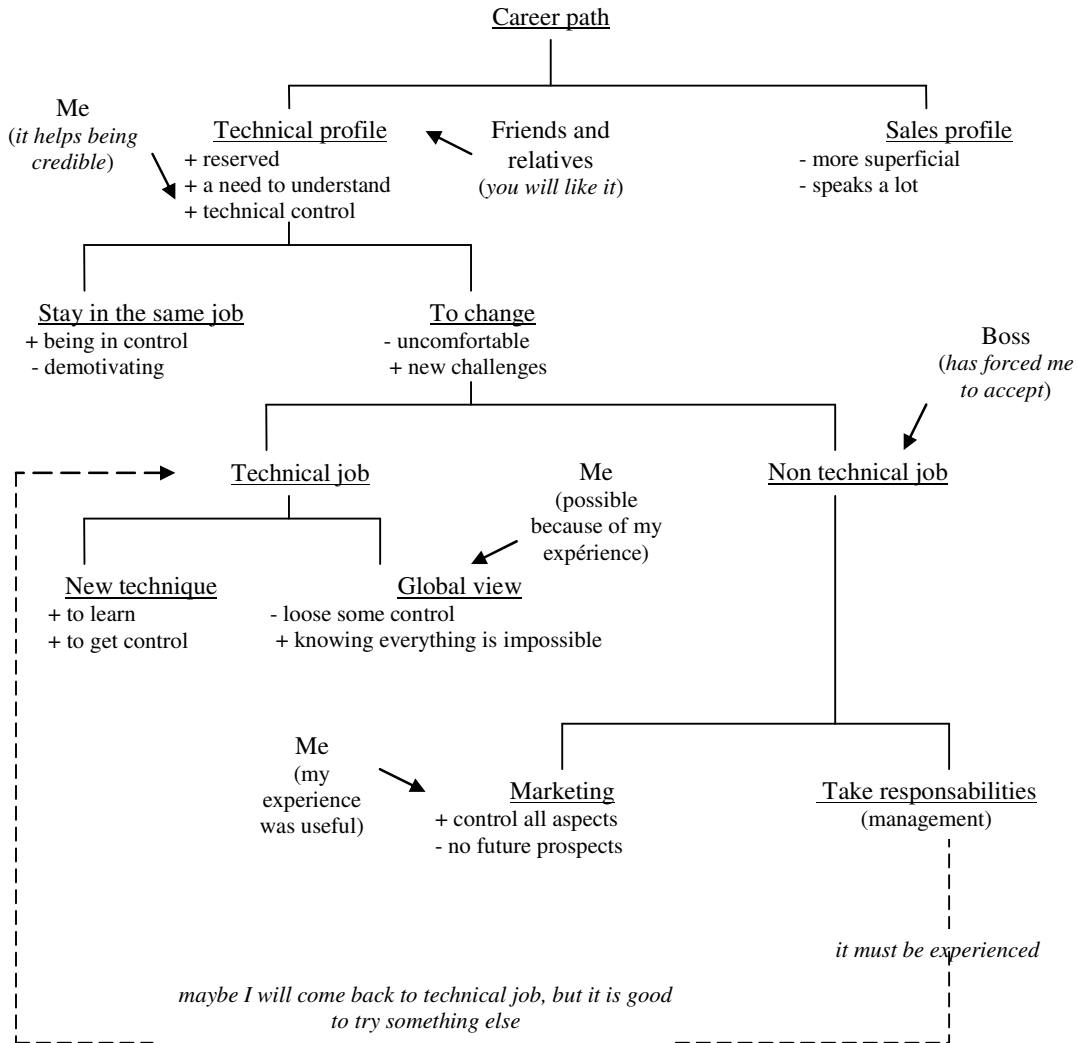
This communication is directed at exploring the attitudes of IT professionals towards technology, to determine if and how gender is involved. This is achieved with two main results. First, the research contributes to our understanding of human attraction to IT. It is more a doing than a feeling, and we have identified mediations that nurture IT lovers’ taste. Innovation in IT requires constant updating on the part of professionals; this is perceived as intellectually stimulating, thus eliminating boredom. Technical jobs usually involve communicating both with people who share a similar background and others with a diversity of profiles, and include a special role, that of “translator”. Second, though male and female interviewees may share an equal attraction for IT, social relationships in the workplace appear to create gender differences. Confronting technology means being tested, this includes the possibility of being successful but also of being evaluated. From this point of view, male interviewees express confidence based on their technical backgrounds, whereas female interviewees do not all appear to have definitively acquired credibility. In particular, successful women speak often of recognition, as if they want to constantly remind us that they are accepted. Further research could investigate the processes by which recognition is given, and perceived to be given to men and women in IT jobs, in particular using A.Honneth’s work on recognition which distinguishes legal recognition and social recognition [Honneth, 1996]. Finally, coming back to the theories which explain the under representation of women in technology, our research does not bring any credit to the essentialist approach of ecofeminism, in as far as women’s love for IT is not seen by IT professionals as contradicting nature. No woman mentioned that the outcome of her work could be described as either feminine or masculine. Concerning the liberal feminism point of view, we can question the idea of the automatic effect of having more women in IT; if social relationships remain gendered and women do not feel equally recognized as men in IT, female under representation will continue. Technology as a masculine culture needs to be qualified; if non-interest in IT is gendered, the opposite does not appear to be true. IT attraction, considered as a practice, was not referred to as a gendering experience. No one has expressed the feeling of entering into male territory, in the sense that IT activities are shaped for men. Some women mentioned that the field was mainly occupied by men, but they thought there was equally a place for them. In fact, certain elements of IT culture appear to be gender free, such as being attracted by innovation and intellectual challenge. However, when it comes to power positions, gender is recalled to prevent women from moving up the ladder. Further research could investigate diversity programs looking specifically at whether they address the issue of promoting women in top IT positions and if this be the case how it is undertaken.

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APPENDIX

F1 Schema



M2 Schema

