

# WOMEN ENGINEERS IN CONSTRUCTION: THE FEMINIZATION POSSIBLE AND GENDER DISCRIMINATION

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## ABSTRACT

*This article discusses the challenges of feminization in a specific sector: housing construction. Recent research has brought evidence of the imbrication between work and bullying and gender harassment practices in the construction of the professional identity of construction engineers. Undergoing peculiar organization and working conditions, since early, engineers face the rude and disrespectful treatment received from colleagues and bosses as an integral part of their practical training. In general, these standards of conduct are accepted as normal, not as bullying. For women engineers, there is also gender harassment, which is characterized by explicit situations of discrimination and violence, which tend to negatively influence their greater inclusion in construction sites.*

WOMEN • CIVIL ENGINEERING • LABOUR RELATIONS •  
SEX DISCRIMINATION

**T**HIS ARTICLE BRINGS SOME REFLECTIONS ON THE FEMINIZATION OF ENGINEERING IN Brazil, based on evidence from recent empirical research.<sup>1</sup> This study has aimed to know the concrete work of construction engineers in a specific sector of construction – housing construction – seeking to identify possible transformations in the content, relations and working conditions of engineers in comparison to those of the first years of the millennium.

I interviewed 81 professionals (33 men and 48 women) of different ages and at different times of their careers. The interviews followed flexible scripts focusing on the their professional trajectories and current work. When gender discrimination was not mentioned spontaneously, respondents were encouraged by means of a direct question.

They were interns, construction assistants, engineering assistants, occupational safety technicians, architects, junior and senior engineers, coordinators of construction works, engineering managers and directors, and entrepreneurs. These professionals worked in offices and construction sites, in a project office, an employers' union, and engineers' unions, most of them as employees, others as corporate entities, and some were self-employed.

For this article, I have selected reports from women of different generations, who were at different times in their careers, and also of some men. The strength of women's experiences was the guiding thread of this text, but the theoretical perspective of gender or sex

<sup>1</sup> The project "Engenharia, trabalho e relações de gênero na construção de edificações" [Engineering, work and gender relations in building construction] was developed at Departamento de Pesquisas Educacionais, Fundação Carlos Chagas - DPE/FCC -, with support from São Paulo Research Foundation - Fapesp -, from May 2014 to June 2016. We appreciate the collaboration of Fernanda Mandetta, a fellow of FCC.

relations did not dispense with male voices and experiences, which were essential to understand civil engineering in construction, a work area that has remained masculine. We understand that gender relations, consubstantially with several other social relations, act on society and particularly on work and its environments, engendering opportunities for training, employment and career development which are unequal for men and women. And in engineering, as well as in other masculine work fields, the clashes of power between the two sexes tend to be more explicit, which enhances the perception of gender inequality. This article is structured in four parts, besides this introduction. In the first one, the feminization of engineering in Brazil is briefly discussed and it is argued that its slow pace is based on the strength of the male culture of engineering, especially present in the workplaces of the sector studied. In the second part, I discuss the imbrication of the professional identity of construction engineers with their professional culture, permeated by bullying and sexual harassment practices, a phenomenon that I consider a relevant empirical finding of the research. In the third part, I analyze reports of civil engineers who work in housing construction, in which they expose the naturalization of harassment, focusing on the role of these mechanisms in women's entering and remaining in engineering and their careers. I conclude with considerations on the research data analyzed.

## **THE FEMINIZATION OF ENGINEERING IN BRAZIL**

We understand feminization as a historical process, which shows some regularity over time, situated in a field of work that is masculine, or has had historically insignificant feminine presence, and which is not necessarily linked to numerical evolution (LE FEUVRE, 2005). Studies have shown that numerical feminization is not synonymous with equality; it only indicates the reduction of the exclusion of one sex and alters neither the sexual division of labor nor the relations of power (FORTINO, 2009). In engineering, resistance to the inclusion and integration of women has persisted and is denounced by their slow pace, when compared to that of other equally prestigious professions, such as law and medicine. According to the statistics of Census of Higher Education of the Ministry of Education, the female share of enrollments in undergraduate engineering programs rose from 20.1% in 2000 to 25.5% in 2012 (SALERNO et al., 2013). Although the variation that exists between specialties (for example, in chemical engineering, half of the students enrolled were female; in civil engineering, 21%; in computer engineering, 11%) must be considered, feminization in engineering is undoubtedly far from that of law and medicine, careers in which respectively 53% and 55% of the students enrolled are female, according to the same source.

On the side of formal economy, in turn, there was a relative growth of 3% between 2003 and 2013, and in 2013 women engineers occupied 17.7% of the engineering jobs, according to the data of *Relação Anual de Informações Sociais – RAIS* [Annual Report on Social Information] (BRASIL, 2003, 2013). In medicine, in the same year, 44.4% of the employees were women and, in law, 51%.<sup>2</sup> According to the same source, their compensation levels remain significantly lower than those of men, because 57% of male engineers earn more than ten multiples of the minimum wage – MW –, 17% of whom more than 20 multiples of the MW, whereas only 44% of female engineers fall into this pay range. Recent studies, such as those by Marques (2010), Cascaes et al. (2010) and Tadim (2011) have demonstrated that women engineers are segregated not only horizontally – mainly engaged in civil, production and safety, agricultural, forestry, livestock, electronics, and chemical engineering –, but also vertically, not managing to reach the top of hierarchies, a difficulty that they share with all other women professionals. These have been some of the reasons often invoked to justify the low presence of women in the profession.

Some scholars have contributed with other dimensions to the understanding of the slowness of feminization in engineering by analyzing not only the construction of the professional identity, but also the culture that develops in the workplace or professional culture. The negative image of the work environment in construction has undoubtedly been a disincentive to the integration of other women engineers, mainly in construction sites. And the non-virtuous circle reproduces itself. Female construction engineers are seen and see themselves as an exception, as women with a peculiar personality that favors that inclusion; moreover, the so-called exceptionality of this small group does not attract other women and even tends to push them away. On the other hand, because they are few, a female collective that could seek the actual transformation of practices, beliefs and behaviors in the workplace fails to be formed; also, successful women engineers tend to assume the masculine ways of acting and thinking at work and in team management, as a form of survival, resistance and defense, and one can rarely find among them a critical vision of the inclusion of women in these masculine spaces of power. Based on empirical evidence, I hypothesized that the masculine and male-chauvinist culture that is active in housing construction intimidates women and is a barrier to the greater inclusion and permanence of women engineers in construction companies in general and in works in particular.

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Considering the occupational families lawyers, public prosecutors, public defenders, and the like (Classificação Brasileira de Ocupações – CBO [Brazilian Classification of Occupations]).

## IDENTITY, PROFESSIONAL CULTURE, BULLYING, AND GENDER HARASSMENT IN CONSTRUCTION

We follow Dubar's understanding of "identity" as

[...] a simultaneously stable and provisional, individual and collective, subjective and objective, biographical and structural result of the various socialization processes that together construct individuals and define institutions [...] The spheres of work and employment [...] and also of training... are relevant areas of individuals' social identifications. (2005, p. 136-146)

One's professional identity is built on a process of socialization that links professional training, work and career, within various companies and institutions, as well as participation in trade unions and other collective associations, and this is the path that legitimizes individuals, attributing professional recognition to individuals themselves, to the peer community and to society. Far from being static, professional socialization pervades the life course of individuals, is in constant construction and reformulation, subjected to wider social, economic and psychological interferences. The process of professional socialization will be responsible for transmitting a common cultural basis of the profession, composed, among other dimensions, of a particular worldview, practice, language, and ethics. According to that author,

[...] it is fundamentally not about the accumulation of knowledge, but rather the incorporation of a definition of the self and a projection in the future, involving, first and foremost, the sharing of a culture of professional work and the demand for a job well done. (DUBAR, 2012, p. 357)

Wendy Faulkner is a feminist and a researcher of engineering. One of her concerns is to understand the factors that have made it difficult for women to enter and remain in engineering. In an ethnographic study on six companies employing engineers in the United States and England (FAULKNER, 2009), she detects the importance of professional culture in the workplace, at organizational and individual levels. According to the author, the professional culture of engineering, strongly marked by dominant masculinity (more pronounced in some specialties than in others), plays a crucial role in integrating professionals, acting in opposite directions for each of the sexes. That is, integration tends to become easier for most men – supposedly attuned to dominant masculinity – and, at the same time, tends to become more difficult for most women – supposedly attuned to its opposite, dominant femininity.

It is in this sense that the author states that working, “doing the job” is inseparable from “doing gender”. In the author’s words, the definition of professional culture:

[...] a rather amorphous collection of practices which characterize everyday interactions between engineers [...] Some of these practices are directly work-related, others reflect engineers’ shared identities as engineers, and others reflect their out-of-work lives and identities. These three strands are inextricably interwoven in people’s everyday working lives, which is why doing the job so often involves doing gender. And this is significant because workplace cultures are extremely consequential, in two crucial ways [...]. First, they oil the wheels of the job and the organization. Second, they shape who is included and who is excluded at work. (FAULKNER, 2009, p. 5)

We agree with the authors on the importance of coexistence in the workplace, because it is there that professional socialization, initiated in schools and shaped in practice, is expressed through expectations, concepts and prejudices, forms of treatment and language, worldviews, etc. In addition, the work and social relations that are woven around it in companies and institutions reveal the power games and the struggle for spaces and positions in the world of work between the two sexes, or the social relations of sex or gender (KERGOAT, 2009). Situated work is thus a privileged place to observe social, work, sex and professional relations.

And every engineering specialty expresses a particular professional identity. In housing construction, “real” civil engineers are considered to be the ones who have complete mastery of their profession, which includes knowing how to develop a project in its many stages and knowing the field activities, managing and solving all kinds of problems, whether technical or managerial. They must also take full responsibility for the construction, be accountable for success and failure, and be responsible for execution deadlines and for quality and safety parameters. In other words, to be complete engineers, professionals must have worked on projects – whether in a project office or in engineering departments of construction companies – and in construction sites. For Alexander, 29, a male resident engineer in construction A, to be a construction engineer is – “70% of the time” – to manage people, suppliers and contractors, technical or administrative employees, besides conflicts of interest of all kinds. Therefore, the pressure of construction companies for compliance with the parameters of quality, deadlines and costs of the work is put on residents. In addition to the pressure on these three aspects, engineers

have to deal with a growing number of third parties to be managed, with the inspections and requirements of funders regarding safety and quality, with increasing consumer awareness of their rights, and especially with the absence of well-trained and experienced blue-collar workers – foremen and supervisors. All these factors contribute to the increased stress of construction engineers. According to Vandré, an engineering coordinator at the same construction company, today the great challenge of a construction engineer “is to overcome pressure. I don’t know construction engineers who are not stressed, they’re all stressed out. We realize that today’s construction engineers are all on the edge” (Vandré, January 31, 2015).

A civil engineer who masters projects and also works on construction sites is not common, in the opinion of several interviewees; the most frequent situation is the specialization in projects or works, both due to job opportunities arising in individual paths and to personalities and preferences. In the case of the construction engineer – more emblematic and visible than the one who works on engineering projects in the construction company’s office –, the labor market tends to value professionals with a diversified and extensive portfolio of experiences. The career to the top of the hierarchy – resident engineer, managing engineer or production engineer – involves going through all the phases of hands-on learning. A frequent journey – though not the only one – tends to take several years, beginning with the internship as a student, continuing in many companies as a construction assistant after graduation, until one reaches the engineering career itself, at junior, senior and full levels, with the right to the professional minimum salary determined by law. Another alternative is being hired as a corporate entity, after graduation, and providing services to one or more construction companies. This long journey promotes the definition of himself as a male construction engineer.

As we could deduce from field research, construction engineers in housing construction became accustomed to: situations of labor exploitation and intensified work, which includes working beyond contractual hours and on weekends, always at the mercy of the needs of the construction work, whether they are interns or graduates; earning lower compensation than that consistent with their training as engineers; being hired as a corporate entity for the convenience of companies; working in uncomfortable or unhealthy environments, with pronounced and prolonged physical stress, as in the case of construction. Linamara, 36, coordinator of constructions works at construction company C, for example, recalled the time she worked as a resident in large projects contracted by international developers, which required total dedication. There she worked “from Monday to Monday; the day I left early was Sunday, at 4:00 p.m.” (Linamara, June 19, 2015). Lina,

20, an intern at construction company A, in turn, reports the physical fatigue and contingencies that have to be managed at the construction site: “Here I weary both mind and body, we go up and down all the time. We haven’t had an elevator for two months now, it’s twenty stories... Sometimes we have to operate the crane, which is on the 12th, so we go up the stairs all day long” (Lina, February 10, 2015).

Engineers also become accustomed to the rude, often disrespectful, language of their colleagues, and chiefly of bosses, permeated with swearing, depreciation, and authoritarian and male-chauvinist statements. They became accustomed because they consider that these situations are part of the professional trajectory of construction engineers, without which their practical training would not be complete, nor would their professional identity as a civil engineer in building construction be legitimized.

In short, becoming “real engineers” in housing construction necessarily implies accepting situations of exploitation (intensified work, extended work days) mixed with interpersonal relationships that are not always respectful, as a necessary evil that is part of their professional identity. In other words, the professional identity of construction engineers is also forged by incorporating bullying and sexual harassment practices, which are trivialized in patterns of conduct and relationship. And when these engineers reach top positions at work, they will tend to reproduce the same logic with their subordinates. As confided to us by León, 25, an intern in construction company D, who works 12 hours a day, he decided to drop the internship and the career chances in this big company because, besides feeling exhausted and “exploited,” he realized that he was reproducing the behavior of his resident, treating his colleagues and other employees badly, swearing and being rude.

That there is overlapping of hard and intensified work and high standards of responsibility and performance with situations of bullying and sexual harassment in the constitution of the professional identity of the male and female engineers, in the housing construction sector, I consider a relevant research finding. Failure to recognize these practices as bullying and sexual harassment, and instead identifying them as being part of the type of activity, justifies and legitimizes them and, consequently, trivializes them.<sup>3</sup>

### 3 BULLYING AND SEXUAL HARASSMENT

The International Labor Organization – ILO – assumes that bullying exists

[...] When someone behaves with the intention of belittling the other by vengeful, cruel, malicious or humiliating means. Such

<sup>3</sup> Trade union leaders of Federação Interestadual de Sindicatos de Engenheiros - Fisenge (Interstate Federation of Engineers' Unions) - affirm that bullying is embedded in the professional culture of engineering, to the point of being considered “natural.”

acts may be directed against someone or group of workers. It is a practice in which criticisms of the other are repetitive, aiming to disqualify and disparage him, isolating him from contact with the group and spreading false information about the person. (HELOANI; BARRETO, 2015, p. 147)

Pezé (2001) broadens the understanding of the phenomenon, since, besides including it in the structure of work organization, considers the psychological and behavioral effects on the victim of harassment and his or her colleagues and superiors. For the author, bullying is a deliberate technique of emotional destruction of the other, for economic or personal purposes, whose effects are accentuated in the globalized economy, with intensification of work, destabilization of labor relations, and the dismantling of collective defense strategies in the workplace and in instances of union representation. This situation induces psychological suffering and engenders defense mechanisms on the part of the worker, among which is an additional intensification of his or her work to prove that s/he is capable and productive, and that s/he can meet the requirements, in reaction to the devaluation suffered. Harassment builds a fruitful field for submissive, dominating and defensive behaviors. Tolerance of injustice and suffering inflicted on the other tends to be erected as a “defensive ideology of the profession or occupation,” since

[...] A true man must be able to ignore fear and suffering, not only his own but also the other's. Social virility is measured by the ability to inflict violence understood as necessary on the other, which unites a collective of work around a defensive radicalization against “people with disabilities”, “blacks”, “women”. (PEZÉ, 2001, p. 33)

In this perspective of bullying, a relation of cause and effect is established between the deepening of the mechanisms of defense of the workers and the deterioration of working conditions, and this can go so far as to blur the perception of reality on the part of the subject, who then incorporates and trivializes harassment situations.

But what can one say when the harassed is not a male engineer, but a female engineer? With regard to women, there can be sexual harassment can be added to this scenario, according to Rios (2015), their situation is characterized by “sexual harassment and bullying”. Discrimination related to the status of women at work, or gender discrimination, may evolve, in androcentric environments, to sexual harassment, which differs from bullying. Barros (1998<sup>4</sup> apud RIOS, 2015) characterizes sexual harassment as any kind of incitement of sexual nature that violates the dignity of, intimidates or humiliates

<sup>4</sup> BARROS, Alice Monteiro de. O assédio sexual no Direito Comparado. *Ltr*, ano 62, n. 11, p. 1465- 1476, nov. 1998.

the worker. If a woman wishes to join the community of engineers, she must go through the same socialization, find her own definition of female engineering professional and, moreover, accept the challenge of living with machismo and discrimination based on sex, of which bullying and sexual harassment are expressions.

The members of the Women's Board of Federação Intersindical de Sindicatos de Engenheiros – Fisenge [Interstate Federation of Engineers' Unions] – have included the issue of bullying and gender in the agenda of activities since 2011, when the Women's Board of Directors was institutionalized in the statutes of that Federation. According to the current director, "Bullying has continued to be on the political agenda. It is a constant theme because it doesn't end, it is not a campaign" (Cintia, collective interview, May 28, 2015). Alba, female agricultural engineer of Sindicato de Engenheiros da Paraíba – Senge/PB [Paraíba Engineers Union] –, one of those responsible for establishing gender issues as a policy at Fisenge, argues that the biggest fight is against the machismo established in society and in professional practices and that there is a need for women to become aware that they are discussing power relations. According to Alba, "Because it's a power relation. For now, spaces are granted. We have to have enough political organization to compete for power; otherwise, we will continue assisting men for the rest of our lives" (Collective interview, May 28, 2015).

Several activities aimed at raising awareness about the naturalization of bullying and gender harassment in engineering were developed in 2013, 2014 and 2015 by the Women's Collective and the Women's Board of Fisenge, which subsequently spread among the unions of engineers who are members of the Federation. For example, in 2013, on International Women's Day, the Board and the Federation organized the seminar "Bullying. Life, survival and diversity" and launched the comic series *Engenheira Eugênia* (Eugenie, a woman engineer), comic strips whose objectives are "to raise awareness and provide training in relation to violent practices against women, especially bullying" (FISENGE, 2014).<sup>5</sup> Also worthy of mention is the seminar "State, power and harassment: labor relations in public administration", held in Curitiba on April 27, 2015, with the articulation and support of numerous entities.<sup>6</sup>

5 The comics strips are available at: <<http://fisenge.org.br/index.php/coleativo-de-mulheres/quadrinhos-da-eugenia>>.

6 Please see report on *FISENGE em Movimento* magazine, p. 10-13, 2015. Available at: <<http://www.fisenge.org.br/index.php/publicacoes/revista/item/2518-em-movimento-n-13>>. Access: June 2015.

## **GENDER DISCRIMINATION, BULLYING AND SEXUAL HARASSMENT, AND THEIR NATURALIZATION IN THE VOICES OF MALE AND FEMALE CONSTRUCTION ENGINEERS**

When the women engineers interviewed were questioned about gender discrimination practices at work, in general, their first reaction was to

affirm that they never suffered this kind of discrimination nor did they see it happen to any colleague. Throughout the interview, little by little, they remembered episodes and situations that they had experienced, and verbalized and reflected on them, which reinforces the thesis of the naturalization of exploitative situations at work and of bullying and sexual harassment.

Milu, a 36-year-old female estimation engineer, married with two young children, opted to leave a large construction company “to work in another way, to provide consulting services and because I wanted to be a mother. Leaving home at 6 am and returning at 8 pm, when I returned early, or at 10 pm, I wouldn’t be able to” (Milu, April 10, 2015). Among her memories of the activity in the area, this woman engineer brought situations in which she was subjected not only to estrangement, but also to distrust and offensive treatments for being a woman. Milu states that, although she has never had any major problems with construction workers, she cannot say the same about male engineers – colleagues and bosses – while she worked as an estimation engineer in construction sites some years later. In one of these, it took Milu a year to convince the coordinator of construction works to implement a cost planning system, because he would not let her in the construction site, “not officially, but he would come talk to me, set up obstacles, he’d say, ‘not today’, the foreman can’t participate with us...”. That the implementation of a new planning system that implied changes raised resistance can be taken as common, but the gender differential can be located within the long process of resistance, because this male engineer:

*[...] didn’t want a woman in the construction site. When an intern went to the work, I realized it. [He would say,] “Oh, because there’s no bathroom for her.”... There were a lot of obstacles. So, this is veiled prejudice. I don’t know whether they’re afraid of being surpassed by women, but they might be, right? (Milu, April 10, 2015)*

In another situation, Milu was induced to rescind the contract of a work at an advanced stage of construction in which she had worked since the beginning, in partnership with another woman engineer. When the latter left on maternity leave, the male architect who took over the post did not want women in the construction site and he proceeded to impose successive difficulties on the performance of her work until she left. Another episode: Milu and other women who worked in a construction company – and they were the majority – were constantly depreciated a male engineer, the business owner. He used to say, “to work, women should be born without a womb and things like that.” So when Milu found a solution to a problem that pleased him and

he said to her, “for a woman, you’re quite smart!”, she considered it a great compliment. According to the interviewee, in the new generation of engineers, this situation has begun to change, because they have lived with women since engineering schools. Prejudice still exists, but “I think a boy would no longer say, ‘Oh, I don’t want to work with a woman, unless she has no womb’”.

Nivia, 35, a mother of two, a 14-year-old and a newborn, is a female construction engineer who supervises works in a managing company. Hired as a corporate entity, she knew that she would soon be dismissed from the company due to the crisis in the construction sector. She simultaneously used to work as a self-employed service provider, dedicating herself to construction engineering. At the time of the interview (April 2015), Nívia was theoretically on maternity leave of a 50-day-old baby, but she continued to supervise three construction works and took the newborn with her. She has lived with Arnaldo for three years, who is also a civil engineer and is currently unemployed. Born from a middle class family of the metropolitan region of São Paulo, she faced strong family resistance when she chose to study engineering. Resistance came from the women of her family, who despised her: “Engineering is a man’s thing”; “A woman engineer? I’ve never seen one, you can’t do it, you’re not smart enough for that”; “You’re dumb for that.” (Nívia, April, 2015).

Nívia has worked in construction sites since she was an intern. In her career, she often assumed sole responsibility for the work as a resident engineer – before graduation –, working directly with blue-collar workers – construction foreman and supervisors. In most of the constructions she conducted, she either worked for small contractors or directly for the client – often a male engineer who subcontracted the service – always as a hands-on engineer in the construction site. This direct contact led to several conflicts of authority with laborers and foremen, in addition to explicit situations of sexual harassment by engineers and contractors, which she mentioned spontaneously. In one of these situations, sexual harassment came from a resident engineer who used to harass the women who worked with him. When they traveled together to visit a work,

*I had a cramp, he stopped the car and ran his hand on my thigh: “Let’s buy ointment and I’ll massage your leg.” I got out of the car, I went away. “I quit. I’m no longer working for you.” He harassed my sister, who did give in, a friend, who didn’t either, and then he was successful with one who needed money, the secretary. (Nívia, April, 2015)*

Gardênia, 35, graduated in civil engineering in 2002, was married with a three-year-old son at the time of the interview. She oversees a

major road work for a managing company which works for a company of São Paulo state. The work is divided into six construction sites or lots led by consortiums of large constructors of infrastructure works. In the current work, when there is a general inspection meeting,

*[...] Only 1 out of 30 engineers is a woman. In the infrastructure area, [the presence of women] is even rarer... In the housing area, real estate development, there is prejudice, but, in the infrastructure area, it is much worse. (Gardênia, April 15, 2015)*

Gardênia relates the aforementioned prejudice to the constant mistrust of women's technical ability, mixed with the identification of behaviors that would sometimes be reprehensible, because they refer to a female (emotional) model or to a male model of (fighting) behavior, both stereotyped. In her words:

*To think that we lack technical knowledge, that we're very emotional is real prejudice. To think that, if we see a problem, we want to argue, fight [laughs], we want to fix it overnight is prejudice too. I have a colleague who is outraged when she sees a situation of explicit prejudice. I don't mind it, I think we have to deal with it because it won't change today. And we'll show that we can compete by showing our work. I cope with this daily in the consortium company here. (Gardênia, April 15, 2015)*

This engineer's statement demonstrates, first, that the disparagement of women's capacity in infrastructure works is continuous, regardless of whether there is a fact or situation that triggers it, because it is gender bias based on power relations verbalized by men. For being repetitive and continuous, it is bullying. It intends to subject women while men preserve the professional field for themselves. Second, such report shows that she takes this situation as normal and, at least in her discourse, does not mind it. Focusing on work and making it their mirror, aiming at their acceptance as professionals, is the recipe of almost all women engineers to deal with the explicit machismo of the area. For this reason, they have to show that they "can handle it", working much more than men, being available at any time of day and night and on weekends. In her words, how work invades the private time that should be devoted to rest, and to one's family:

*I'm available all the time... And with the people whom I know I can talk about the work on Friday at 9 pm, I don't mind discussing work. Why? It's when my son is sleeping, my husband's watching a movie, I'm not doing anything... But it's not hard, you know?... I love what I do... I don't mind answering the phone on Saturday morning... I*

*pick it up, I talk, I read meeting minutes that got ready on Friday at 9 p.m... I email back with comments... It's not a problem for me... I think it makes it a lot easier because on Monday I don't have to be at the office at 8 o'clock.* (Gardênia, April 15, 2015)

At the time of this interview, the construction sector was reducing staff numbers; Gardenia reports that the mostly male engineering team was reorganized and became mostly female, for productivity reasons: “The team consisted of seven people, four men and three women; now it has one man and three women... The criterion for the dismissal was to preserve those who could handle the work of the other” (April 15, 2015). In this regard, she understands the recognition of the quality of the work of women engineers in the corporate world has been taking too long: “male engineers accept female engineers reluctantly”. Gardenia reports a previous situation of selection, in a company that manages works, in which she was turned down for the job and a man was selected. She was offered a very low salary, which she did not accept, but later she learned that a male engineer had been selected, “He [then the coordinator of construction works] had high expectations of this guy... And today I am the right arm of the current coordinator” (April 15, 2015). Gardênia thus reveals the fatiguing strategy of women to be included in an environment such as the engineering of infrastructure construction: “I think one of the things that motivates us to do more and handle more is this: showing that we can do as much as [male engineers] or more” (April 15, 2015). Gardênia, like most of the women engineers interviewed, takes full responsibility for the course of her professional career. Asked about what companies and women professionals could do to further open the field of work, she believes that “it depends on women themselves.” Taking herself as an example, she believes that women can handle professional demands and those of their home, family and children.

So does Ireney, the coordinator of construction works at construction company G, two sons – 17 and 10 years old – who stay with her grandfather waiting for her and her husband, who works 100 km away, to arrive. Ireney acknowledges having a “quadruple working day... I don't think I need to sleep much. I wake up at 5 a.m. and go to sleep at midnight. It's my routine... but I'm okay, I'm used to it; for the time being, I can handle it” (Ireney, Sept 28, 2015).

Gardênia thinks about having another child and is going to

*[...] try to reconcile [with the work], I even intend to talk to the guys here before. I don't think it's fair to say “I want to get pregnant now” regardless of the company's plans for me. If I want to succeed, I have to find a middle ground.* (April 15, 2015)

In other words, Gardênia's next pregnancy will be negotiated with the company, which, at the time of the interview, signaled that she might be promoted, which would imply coming to the office: "If that were the case, now it wouldn't be the right time for me to get pregnant. It would be a good time for me to get pregnant in a year, to put things on track and then be able to leave for four or five months" (Gardênia, April 15, 2015). The interference of the productive sphere in the reproductive sphere in the life of this engineer is considered natural, normal, expected! The desire to reconcile career and maternity makes her subject the individual and conjugal plans of maternity to the time and interests of the employer, in an intense degree of subjugation of the female labor force to capital.

Nevertheless, the results of this conciliation strategy may fail to be the expected recognition, as it was Ireny's case. This woman engineer is currently the coordinator of construction works at construction company G, in Campinas, and has two children. One month after her eldest son (now 17) was born, she had already returned to work, following an exhaustive routine of comings and goings to breastfeed him. After six months, the owner of the construction company fired her and said, "'You're not the same anymore.' Come on, I didn't go on maternity leave and I'm not the same? He's gotta be kidding!" (Ireny, Sept 28, 2015).

Iris, 54, single, architect, owns an architecture firm of architectural projects dedicated entirely to the provision of services to construction company B, in which she also has a small equity interest. Construction company B was founded by Iris and Oscar, an engineer who is its current owner, in the 1980s. Since then, a strong working relationship has been established, based on friendship and trust between the two, which continues to this day. In the early 1980s, when Iris began her career as an architect "of construction works" (because, since she was an intern, her professional career took place in construction sites, "hands-on", developing the work of a resident engineer), she heard from professors, friends and family that a woman in construction sites "won't work", much less a "woman architect". Her persistence to prove her technical ability contributed to the success of her career and she witnessed the entry of women interns into construction companies in the following decades, mainly in projects. She emphasizes the need for women to "always prove that they're much better to stand out." She is one more professional who carries her professional success and failure on her shoulders and takes her experience as an example that can be followed by other women who wish to be successful. Always based on constant tackling and overcoming adversity, and on intensified and arduous work.

Mildred, a 29-year-old newly married woman, is a technologist in construction and a civil engineer, and graduated respectively in 2011

and 2013; she has worked for construction company B for seven years, ever since she was an intern, always in the office, in the purchasing and supply department. She is the only woman engineer working in the construction company, a family business with a reduced technical staff. Mildred can be said to be invisible as an engineer. Her immediate boss, Ronei, an engineer, when listing by heart the small body of engineers and interns at construction company B, failed to remember to include Mildred. Even after graduation, Mildred continued to be paid as a buyer, with a salary far below the pay levels of engineers. She has repeatedly proposed (as an intern and as an engineer) implementing a planning system for works, which would assist field engineers, since the construction company does not offer them such technical back up. In her words, the resistance she faced as a woman, when she proposed changes in the way work is done:

*The staff (of the construction company) is older... They are very resistant [to changes]. My proposal was to go to the construction site to help them do a planning, to help this work advance... I went a couple of times, talked to the foremen, but then I couldn't develop what I wanted... I was disappointed... I was a little irritated.... As I stay in the office, I notice things they don't see. But I'm a woman, so I think you have to struggle a lot to make them stop considering you a woman secretary, you know? You know, they keep saying "call so-and-so", "print I don't know what"... I made coffee once, and then I said, "I'm no longer making coffee!". (Mildred, Sept 3, 2015)*

Her boss along with the other male engineers exclude her from the discussion of the company's work plans; as a young woman, they give her a place of support in the team, they send her "to the rear... The woman is the one who organizes, the one who knows where everything is and today I feel like this". In the same way, Mildred clearly perceives the distrust in her ability on the part of her boss and colleagues, when they deal with technical matters with her: "It's as if I wouldn't understand some technical terms... as if they were explaining things to a layperson... I do not know if they're belittling me, I try not to see things this way... because I'll get very angry" (Sept 3, 2015). Mildred attributes all the restrictions she suffers from the construction company to the traditional roles attributed to women in society and to the machismo that exists in construction. The same machismo is manifested in the behavior expected from a woman: always submissive and soft. Mildred has to be attentive "to the way you (woman) have to talk to them, I act softly when I realize they're on a bad day. Among them, they don't give a damn, they're rude to each other, there's no softness, you know?" (Sept 3, 2015). Mildred, in turn,

*I can't be angry, you see? He's nervous [because] he's on a bad day. Not a woman: she's stressed out, she's got PMS.<sup>7</sup> So when you're not submissive, when you oppose something, when you don't act as a good friend, people associate you to rude women, to your personal characteristics, not to the professional ones. [You] have to [be] firm and soft. If you're smooth only, it does not work. (Mildred, Sept 3, 2015)*

In spite of her youth, the interviewee is very lucid, and was one of the rare women engineers who demonstrated awareness of the subaltern position of the women in that area and of explicit bullying and sexual harassment practices and verbalized them spontaneously. In her perception, sexual harassment and bullying against women are a reality, the male struggle to maintain power in a traditional profession of men is evident, there are hierarchical and salary barriers that restrict the progression of women engineers in careers. In her words:

*[Sexual harassment] exists, the guy stares at you, comes too close to you and tries..., he whistles, talks, you know... Bullying also exists. The guy will try to belittle you, to say that you're less, that you don't know because you're a woman, only because of that. You may know more than he does, but he'll try to prove that he's better because he's a man and you're a woman. Civil engineering is a very masculine profession. Women have gradually entered this market. Women began calculating, so to speak, before they didn't calculate, didn't go to school, didn't think... Then women began to think, began to take a space that was men's... There's a difference in salary, also because she'll never reach the top. So, I think it's a feature not just of civil engineering, but maybe also of other engineering, of other professions, especially those that were masculine. (Mildred, Sept 3, 2015)*

Linamara is a 36-year-old engineer, with two small children, aged six and two years. Since graduation in 1999, she has always worked on construction sites, has taken turns for short periods in offices, but she prefers construction sites, where she was an intern since her second year in college. Linamara has worked in several places, seems to be very respected by the owners of construction company C, where, between comings and goings, she has worked for 16 years, and where she coordinates construction works. Today she “just guides”, she has learned not to “do things” that are the resident’s responsibility. Perhaps to police herself, she was dressed “to go out” and wearing high heels at the construction site. The reconciliation between work and motherhood was not easy for Linamara; she confided that, while expecting her first

child, she was seven months pregnant and asked the company to be transferred from the construction site to the office because there she had many problems, she was very nervous and already heavy, she could not walk through the construction site as before, “I couldn’t follow the work well, as it should be.” Her request was not granted and, after a carnival holiday during which she worked every day, her son was born premature. While expecting her second child, she “learned not to suffer anymore,” so much so that her gynecologist told her that “her mark during the pregnancy was ten!” Linamara’s suffering reveals the anguish of women facing high self-imposed (and expected) performance standards in professional and private life. Moreover, in construction, from the transgressive women engineers who work in construction sites, the following is not acceptable: technical failures, management failures and, above all, affective involvement with colleagues and bosses. As an operations manager at construction company Z reported, no more women engineers were hired into the field after “There were problems of affective/sexual relationship between a female production engineer and a male resident engineer” (Joaquim, Sept 19, 2014), an episode that led to the woman engineer’s dismissal. In this case, according to the interviewee, there was bullying against the woman engineer after the end of the affective relationship with her superior.

Linamara expresses her conception of what a construction engineer (resident or coordinator) should be: “It’s a lot of responsibility, I can’t forget my responsibility, I sleep knowing that I have a lot of things to do, it consumes me” (Linamara, June 19, 2015). This woman engineer reveals, therefore, her getting used to the workload and responsibility, to long working hours and to the work on weekends, which permeates the construction of the professional identity of construction engineers, regardless of their sex, and that begins in practical learning in internships. Being an intern since the beginning of college is very common and desired by future construction engineers. For example, Leon, 25, is in the fourth year of civil engineering and has been an intern since the second; he studies at night and, at the time of the interview, was an intern in the work of a large business, construction company D, in São Paulo city. He confirms that the contract he signed is for six hours of work a day, “but no one complies with it, I work 12 hours, I come at 7am and I leave at 7pm.” He recognizes that, in order to be hired, he must have experience: “It’s labor exploitation, but it’s worth it because I’m learning.” (Leon, May 29, 2015).

In order to be heard, female residents must harden, especially at the beginning of their careers because, in addition to being women, they are young: “When you graduate, you think you have to be like men, strong like them, to demand a lot from employees and contractors... You end up suffering a little more. Today I take it easy so

as not to scare them” (Linamara, June 19, 2015). She recognizes that female resident engineers need to want a lot to work on construction works, because “in addition to having focus, persistence, discipline, and knowing how to deal with people,” having a “dominant, leadership profile,” as she does, helps. Especially in large construction companies working for international developers, where the technical level is very high and where only high performance professionals can stay. In these companies, an even more masculine universe prevails, because “it’s a completely different construction profile. There’s usually more than one shift. And women need to take care of their children, their family... Unless they’re single, don’t have or don’t want to have a boyfriend.” (Linamara, June 19, 2015).

The proactive female profile, willing to do any work, coupled with a strong and determined psychological profile, seems to be decisive for the success of women in engineering. Saura, 60 years old, single, is a civil engineer and owns a project office for building systems in Campinas region. In her long and diversified career, she has noticed the vertical segregation of women. Even today, companies are commanded by men, although there are many women engineers at work meetings, which was unusual when she started her career. The fact remains that, although there are many women interns in the companies today, there are few women engineers; and women residents, businesswomen, and women leaders in construction are rare. In her opinion,

*[...] for women to dominate a very, very male-dominated market, you have to show efficiency, effectiveness and psychological strength... Because for you to command for your whole life an entire office with a lot of men, including many older than you... you have to show that you’re able... to manage technically and administratively... And I think having been supportive and affectionate has helped a lot, in relation not only to the office, but also to the client. (Saura, August 20, 2015)*

An unconstrained, almost heroic protagonism is expected from women engineers, who have to assume the total availability expected from men, the half of humanity that neither gets pregnant nor menstruates, as Saura adds:

*[...] our engineering area requires a lot of decision-making, a lot of presence, a lot of “Go! I’ll go! I’ll do it! I’ll make it happen! I’ll go up, I’ll go down,” especially when it comes to construction sites. The situation of women regarding these fragilities - this I have heard and felt - the matter of the PMS, of pregnancy and some fragile psychological behaviors interfere greatly. So, when it comes*

*to choosing (an employee), they end up choosing a man. Why? Because of physical frailty.* (Saura, August 20, 2015)

In short, this interviewee confirms the cake recipe for women engineers to be successful in the profession: act fearlessly as the socially dominant male would, proactively and as a protagonist, demonstrating to be technically and administratively capable, have a strong personality and impose yourself with respect and, above all, be always available for work, even if you have children, are pregnant or unwell, and are, as a woman, the ultimate responsible for organizing family life and marriage. The slightest deviation from this streamlined stereotype will count against female engineers, who will be likely not to be selected in companies and offices when competing with male ones. The back of the mirror is in the fact that Saura assesses that having a welcoming female behavior, being a good listener and good technical and personal advisor has contributed to her success as an engineer and entrepreneur. She described the paradox to which women are subjected in predominantly masculine professions, always living on a knife-edge, trying to match their woman's identity to the professional performance expected from men. Apparently this female juggling has been possible for many women engineers who have built their careers in construction, although it brings personal suffering, to a greater or lesser degree. Such suffering is normally sublimed, trivialized, often overlooked, not admitted, or diminished, never demonstrated, because it is seen as an integral part of the profession chosen, especially for women engineers who have had the chance to go up the corporate ladder.

Justina, 50, married with two children, aged 21 and 14, graduated in civil engineering in 1988. She lives in São Paulo during the week and maintains permanent residence in another state. She has worked for 30 years in the construction sector and has had a diversified career; she is currently a senior manager at an association of manufacturers of building materials, where she is the only woman in the board. She has accepted all the challenges that appeared in her career until she reached her current position, which gives her a lot of visibility. At the same time, she made efforts to reconcile the roles of mother, wife and professional. In her words, the making of this successful trajectory – the sacrifice and the juggling she had to do, the psychological suffering and physical fatigue – is neither imagined, nor known by her peers, for whom she appears to be “always feeling well”. Her recipe for female success in a universe of men is similar to that of other female respondents, namely, discretion in dress and behavior (which does not include sloppiness), always having emotional control, because otherwise “she will fall into disrepute, you see? Women are like that, she's in a bad mood 'cuz she's got her period...” (Justina, April 8, 2015), knowing when to compromise,

negotiate and when to be firm and impose one's opinion, being always available for work, overcoming obstacles, and giving constant evidence of her technical ability, conquering her space, but meekly. The demand on a woman engineer is "very, very, very great" and she is always the object of observation and judgment: "You're a butterfly under a pin, the butterfly that the scientist pricks and evaluates, you move the wing like that, you do this and that. You and your slightest reactions are always being watched" (Justina, April 8, 2015). She also admits that a good evaluation of a woman engineer engenders the hiring of other women and that the opposite is also true. Justina expresses with unusual clarity the paradox which women engineers and other women in masculine professions are subjected to: if women have so desired the place of men, they must be "like them", they "can't be women". She explains:

*Women have fought so much for a difference. What is our difference today? We're able not to be women, we can be like men, we can act, think, reason as men do. What does the masculine world demand of us? Not only perception, communication, things that are often not in the male profile, but also that she doesn't have the negative [feminine] side, you can't be fussy, you can't get upset too easily. You're in a professional environment. Don't you want the same place they have? So you can't impose the fact of being a woman on an organization. What happens is that there's a natural barrier because, when you think of hiring a woman, you say "Now she's single, but she's going to get married, get pregnant, she's going to go on maternity leave, she has a lot of things that a man doesn't". Whether you want it or not, it impacts a company's costs. So, you have to overcome this, the quality of your work has to be desired, even if I have maternity leave... [if] you want to be in this universe, which works that way and won't change. (Justina, April 8, 2015)*

Male voices provide a counterpoint that helps understand gender relations in building construction and the position assigned to female engineers in construction companies, as the interviewees' reports have shown. In general, the discourse of the male engineers interviewed, and particularly of those older than 35, regarding the female presence in the sector, is politically correct. They see such presence as normal and growing, reiterate that there is no difference in intellectual capacity and technical training between men and women, and even emphasize the supposed advantages of female engineers over male engineers, namely a greater concern with quality, organization, and the details of the work, a broader view of the chains of work. These would be competitive advantages of female engineers, despite a possible pregnancy followed by a temporary leave from work, absences due to children and family's

needs, and the biased attribution of some emotional variation to hormonal oscillation (PMS). Arnaldo, 36, Nívia's companion, for example, states that "if people are competent, regardless of whether they're male or female, I see no problem" (Arnaldo, April 17, 2015). His discourse underscores impartiality in professional judgment, eclipsing the sex of the professional and gender relations. Vinicius, a 36-year-old engineer, working as a construction assistant at construction company A, brings a more accurate observation of the issue, shared with some male and female colleagues of the new generations. He refers to the same gender discrimination that challenges the inclusion and permanence of female engineers in the works, placing it also as a clash of power that occurs with blue-collar workers, too. In his perception, "laborers don't see women as superiors, as people who can teach something" (Vinicius, January 31, 2015).

In general, male colleagues and bosses sought to exempt themselves from possible responsibility for relationship problems and discriminatory attitudes against women engineers, and transferred it to laborers, foremen and supervisors. They hinted at or made explicit an alleged rudeness of laborers, against which women should be protected, justifying the small female presence in construction sites as a matter of safety. The report of Ronei, a 61-year-old engineer, coordinator of purchases, cost and planning in construction company B, is an example of this discourse:

*There's still some concern about the presence of the female at the construction site because the work is rougher and the staff is ruder. I think companies are more concerned about the safety of women. I think there's no difference between men and women as long as you sin on the same level. The female is more concerned with the quality of what she's doing. (Ronei, September 3, 2015)*

## FINAL THOUGHTS

This research has provided consistent evidence on the imbrication between work – its organization, pace, conditions, working relationships – and certain bullying and sexual harassment practices in the construction of the professional identity of male and female construction engineers working in the housing construction sector. In this sector, "real" engineers are considered to be the ones who have complete mastery of the profession, which includes knowing projects and works, solving all types of technical and managerial problems, and assuming full responsibility for the construction work. They are subject to strong pressure in the exercise of their activities, to meet deadlines and costs, within the specified quality and safety parameters. Construction engineers have become accustomed to the long hours, the intense pace, the uncomfortable and often unhealthy conditions of the

works and to putting themselves at the mercy of the pace and needs of such works, day and night, on weekends and holidays. They became accustomed to the rude, often disrespectful, language of colleagues and bosses, because they consider that these situations are part of the professional trajectory of construction engineers, without which their practical training would not be complete nor would their professional identity be legitimized. In other words, the professional identity of the construction engineers is also forged by incorporating bullying and sexual harassment practices. Such practices are trivialized in patterns of conduct and behavior, although, in general, they do not recognize them as such. On the contrary, engineers identify such practices as part of the type of activity they develop, and thus justify and legitimize them, and, as a result, naturalize them.

To the context of women engineers are added explicit situations of discrimination and violence in the workplace, aimed specifically at women. This is how women engineers' technical capacity is constantly depreciated, which makes them work harder than male engineers and accept all kinds of challenges to prove that they "can handle it" and remain in the profession. This is how female engineers also disregard their pregnancy and entitlement to maternity leave and continue to work normally, in construction sites, offices, at home, not infrequently taking the newborn with them to the works. That is also why they must always be discreet – but not sloppy –, friendly and good listeners, cooperative and understanding, giving support to male engineers – preferably at the rear –, knowing how to balance firmness with softness, etc. Otherwise, they will be the object of macho and prejudiced comments, whose focus tends to be sexuality and femininity, motherhood, PMS, reinforcing a supposed inadequacy between the female sex and construction engineering in works. As defined by one interviewee, the demands on women engineers are very large and they are under constant observation and judgment, being subjected to the paradox of, at the same time, being like men and not being a woman.

The experiences of the female interviewees reveal numerous episodes of gender discrimination, bullying and sexual harassment, but most of them do not consider them as such. On the contrary, they understand that, if they are to enter the profession with legitimacy, they must see discrimination and harassment practices as normal, as a kind of toll to pay for their acceptance in this masculine and macho professional culture. In this sense, it is not surprising that there are so few women working as engineers in construction companies, even fewer in works, and that female resident engineers or coordinators of construction works are rare. Feminization, particularly in the latter jobs, faces the masculine professional culture forged in housing construction, as we have seen.

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