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2. Work conditions and environment

Introduction

The qualitative inquiry, in which individual narratives of male and female physicists were collected, provides us with a rich, comprehensive and diversified image of current work environments and work conditions in different European localities of physics. Sociological studies on academic and research work environment usually analyze individual evaluations through the prism of **job engagement** and **organizational commitment**. While the first dimension sheds some light on one's devotion to the essential aspects of the work, the latter emphasizes willingness to remain a member of the institution and to contribute to its development. When it comes to the narratives gathered under the framework of GENERA project, the majority of the physicists' evaluations point out high level of job engagement, often correlated with a perception of physics as “hobby”, “passion” and a discipline that has to be accompanied with a personal enthusiasm.

- *I had affection to the career, [work] environment, friends.* 27_F

The main challenge related to such engagement concerns blurred and changeable boundaries of the work, often impacting work and personal life reconciliation.

- *There is always something else that you could do and I think it is very difficult to really be able to define when your work is done and now I know that by not working at weekends and in the evenings in the way that other people do, it might be detrimental to my career, but I know that potentially I am saying, I am choosing here, my own work-life balance. I am choosing something that I am happy with, rather than necessarily what someone else would perceive as being the right way to do science, because you were told by your, by your supervisors that this should be your life and if you don't you feel guilty.* 10_F

Organizational commitment of the research participants is reviewed in much more diversified way. Due to a growing number of administrative responsibilities (e.g. related to supervising or research grant management), teaching and teaching-related obligations as well as new roles of the researchers (e.g. related to dissemination of the results or leadership), the interviewees often demonstrate nuanced and ambivalent attitudes towards the research institutions they work for. Interestingly here, not all of them express a sense of belonging to the workplace, sometimes scientific collaboration goes beyond a parent research organization due to difficulties in social interactions with colleagues and supervisors.

- *I'm not so integrated in my research institute, I mainly work with researchers from another institute and local committee for environment. The atmosphere at my institute had never been good, I do not find an interesting person to work with.* 42_M
- *I'm hired by the [unit], which is a little bit apart of the rest of the theory group, we are in a sub*

*corridor… Sometimes I feel a little bit separated from the other researchers, in this point of view. When we go to big meetings, I'm always surprised to discover people I never met even if we work in the same laboratory! 37*_F

While talking about their positions, roles and commitment to the workplace, the respondents often underscore a general overload in terms of tasks and responsibilities, an importance of supervisors and leaders in pursuing one's career and a permanent lack of time and resources (especially financial) for conducting inquiry.

- *As you say [here], I didn't spend years to have "bac+10" to earn just ridiculous salary you get here and with all the administrative duties and papers, you don't even have the pleasure of doing the science you want to do.* 35_M

Another important dimension of the work environment assessments concerns **psychosocial aspects** of the workplace, often defined as those related to an appearance and specificity of stress factors, coping strategies in stressful situations and sources of social support. Interesting here is that studies of the psychosocial work environment often try to explain "how job demands and social structures and interactions in the organization influence the psychological well-being of employees". Such a perspective thus can bind together macro- and meso-levels of social relations and orders with personal and individual facets of the employees' welfare. This way of analyzing the impact of work conditions will be applied to GENERA data.

The following section discusses crucial dimensions of work environments and conditions with special attention given to gender aspects and precariousness of the employment. Structurally this section is divided into a general description of work conditions, an elaboration of the respondents' evaluations of work environments, and an analysis of changing roles of the researchers.

Work conditions

While describing their workplaces, the interviewees focus on several different aspects related to their employment. At the forefront they usually underlined an importance of unlimited accessibility of equipment and financial resources necessary for conducting research, an access to various sources of scientific inspiration (e.g. seminars, workshops, supervision and mentoring), a type of contract and a satisfaction with respect to salary.

The collected reflections, evaluations and opinions can be divided into two separate paths. The first one embraces mainly positive reviews of work conditions whereas the second path concerns critical evaluations regarding their current workplace. What is interesting here is that the latter opinions were more often expressed by female than male researchers. In some regional contexts such negative reflections in this respect were almost absent (e.g. Romanian, Spanish, and German) while in others they dominated to a certain extent the narratives (e.g. Polish). A duality of the evaluations has been revealed in other studies: researchers are often satisfied with their jobs in terms of "intrinsic motivation", related to the job itself. But they as well express dissatisfaction when it comes to work conditions as "their work environments are getting less favorable under the managerial reforms". In other words, scientists like their job, but not necessary work conditions available to them. Among advantageous characteristics of the work conditions observed in the GENERA study are:

- Access to the basic equipment and office supplies:
  Ah, those are very good. The working conditions are, are generally very good, so, you have (..) everything you need (laughing). Which is not much for us, but anyways, you have everything you need. So computer, office, rooms, that are available, quiet, which you sometimes need

(both laughing). 09_M

Compared to other places where I worked, I think we're pretty well housed here. Everything is not perfect, but I have overall access to what I need to work. 33_M

- Access to advance equipment and laboratories fundamental for research:
  //In doing our experimental work we rely on competitive equipment. We have the same equipment that you find in all great research institutes all over the world. //76_F

- Salary and a type of contract
  Although financial satisfaction has been expressed explicitly only in few interviews, on the basis of more general assessments of work conditions we may assume that the majority of respondents are rather happy with their salaries.

  I've now a permanent contract after long time of fixed-terms contracts, I'm happy with the workload. 42_M

More critical perspective on working conditions contributes to a discussion on a situation of younger researchers within the academic or scientific worlds. It's worth noting that a fair share of the interviewees was employed on the basis of time-limited contracts. The problem of a lack of stability was noticed in various organizations and regions. Although some of the interviewees admit that they understand a general policy of science institutions to support mobility and knowledge exchange by offering a short-term contract and encouraging physicists to “be on the move”, they also observe ambiguous or disruptive implications of such approach for a family and personal life (read more in Mobility, migration…).

- *The only thing in the system that I do not like is that you always have these temporary contracts and for the most part in [the research organization] it is the case that basically only the directors have permanent positions. Maybe one, two scientists, but (…) it is a little bit of a pity that people are always only here for a short period of time and then have to leave again. Because, yes, it helps that ideas continue and I understand the motivation of [the research organization] to maintain such a system, but for those, for the personal life of people, it is not really practical (laughing).* 09_M

It is emphasized that a post-doctoral period can be particularly challenging when it comes to negative consequences of job security shortage and stress related to it. Similar reflections appear in the realm of PhD students' situations, in which they not always receive sufficient financial support and have access to social benefits during the PhD programme (e.g. in Poland where PhD students are often not employed, young female researchers after giving birth do not have access to full-paid maternity leave) (read more Career paths…). Furthermore, the lack of stability and efforts to gain job stability, can lead to a permanent competition with others in a similar situation.

- *When I was a post-doc it was a nightmare of stress. (…) You always need to prove you are better than others to get responsibility.* 05_F

Other studies have documented different facets of changing academic portrait by showing that “academics under this form of managerialism are fragmented as the university hires part time rather than full time academics, and provides contract based employment rather than tenured positions”. Such a fragmentation may also critically influence on the processes of shaping a collective identity of physicists. Some of the interviewees were hired on the basis of a research grant they applied for.

- *I have no certain position. I am here with my own funding (…). I could work anywhere*. 03_M

Critical reflections embrace as well accessibility of office spaces and laboratories and equipment. The problem of underfinancing research organizations and universities not only hampers an individual scientific development, but also hinders knowledge sharing and developing new ideas in a broader sense.

- *In laboratories there is old equipment and it's been here since the 1980s. Usually laboratory are closed, because there is not staff or because there are not money or because there is a lack of ideas and even if they were there was not support from policy makers.* 39_F
- *Office space is always a problem. We don't have enough office space, we don't have money for hiring post-docs.* 01_F

It is worth noting that sometimes the equipment accessibility might be influenced by informal and personal relations. One of the respondents describes her current position in the department through the gender lens and the prism of a conflict with one of the faculty member. According to her, an access to the equipment could be hampered by the discord in the future.

- *When it comes to me personally it is not too cheerful and here in the department we have this equipment that is hard to beat within university, because as far as I am concerned there is no such an equipment elsewhere (...). And this equipment we were able to buy few years ago but I don't know on what basis it was assigned to only two people who do this [CAT scan] in the department and I don't know how it would be if I decided to use it for research (...), I don't know how it would be due to personal conflicts that exist here, not even between those persons who are in charge of this equipment but between [me and] a person who supervises those people*. 57_F

Furthermore, the study demonstrates difficulties in financing research from research organization or university funds. Shortages of financial resources make academics and researchers seek for new potential sources of financial support. The responsibility for assuring research funds is often shifted from an employer to an employee as researchers become primarily responsible for the preparations of grant applications and more generally speaking - for ensuring finances for the inquiry. Such situation may also bring about several other disruptive consequences:

- Emergence of a new **self-financing model** in the academic world, which results in, among others, **being hired depending on receiving external financial support** for the research (and one's position);

  It was known from the very beginning that I should write some project, get some grant from [name of the granting institution] because otherwise they won't hire me here. 57_F

  You have to finance yourself. 76_F

  Since I came with my own money, it was easy [to hire me]. 01_F

- **Youth-oriented grant programs** (or perceived as youth-oriented) causing tensions between researchers' generations

  *You see, right now for young people there is El Dorado, you could say that. (...) So young people have now a lot, a lot of possibilities to go somewhere, organize something and so on. [Talking to the interviewer] You probably also experience this... that there //*are many research grant programs for people younger than 35 years of age and it's easy to get it. As for us elderly, I see our generation is put to pasture (....). //71_M

- Participating in conferences depending on having a research grant, not having access to such financial sources means exclusion from a part of academic activities;

  If you want to go to a conference you need to have externally funded grants. The Faculty won't cover your costs even if you have a speech at the best conference. 55_F

- Proliferation of tasks and related to this difficulties in work and personal life reconciliation;

  //All these responsibilities affect my research and one thing that I can do in this situation is to sacrifice my personal life. I cannot omit my didactics or administrative duties, to have a greater productivity. So the only idea that comes to my mind is to use my teaching experience in order to have some achievements. That was my goal when I started my research team, because we can publish together with my students and PhD candidates and my name is the first one. //61_F

- Growing sense of inequality between regions, universities and researchers:

  It really shocked me to see the difference between research in the United States and Europe. How do you want to do quality work when you are not given financial investment, no collaborators, no real support? [Our country] wants to be at the forefront of research but it does not really give the means. 35_M

  //It is a rat race to get that one special position. I tend to compare science to top sport. If you want to win the gold medal (the permanent position) you have to work hard. Part-time work does not exist, only being part-time paid (…) How unfair, unhealthy or un-whatever it is. It is the game and you have to play it, otherwise you lose. And this counts for both women and men. //52_M

A separate issue emerging in relation to working conditions was **flexibility** understood as, on the one hand, freedom in shaping one's own research scope, design and implementation and planning a work day, on the other hand as the ability to meet the requirements of the academic labour market (e.g. openness to mobility or frequent change of place of employment). It is worth noting that both aspects were assessed ambivalently. When it comes to the first understanding of flexibility, an individual agency in deciding about e.g. working hours was in many ways highly appreciated as it facilitates work and personal life reconciliation. Positive evaluations were given primarily by parents (mostly mothers).

- //I've been scheduling everything by myself for years. (…) My boss is wonderful (…) so I schedule everything absolutely by myself. //56_F
- *For many years I used the flexibility offered by my work as researcher to deal with my family problems and to be a good single father.* 42_M
- *I like in general, I like that you can choose your working hours more or less free in science. So, you don´t need to be there always from nine till five, so you have the choice to come whenever you like. That´s a big advantage. That´s what I find //***a big advantage **////**too when you would like to have children. Because you can come to work sometimes a bit later if the child didn´t want to leave or something like this.//// **[…] That´s what I find especially good in science. That´s what I find really good. The ////**disadvantage is that you have to be in the lab sometimes very long**////. But I believe it could be that this is due to the fact that you don´t have a family. You always think, well, I can stay longer. I can stay longer. I believe if you have family then and go earlier one will complain. //22_F

But, as the latter citation shows, noticing various challenges regarding flexibility of working hours also

appears in the narratives. First and foremost, such critical reflections concern unclear and fuzzy boundaries of work life. In such argumentation flexible working schedule sometimes makes that work never ends. According to the respondents, **a deep commitment to work, staying longer than officially expected in a workplace**, working during weekends and holidays become **“a new normal” of excellence in science** (cf. Sinderman, 1985).

- //I'm completely free to schedule my activities and my time at work, I have always been. To be a researcher in a public research organization it allows you to have a lot of flexibility, which it could mean that you need to work in Saturday or in Sunday or during night also, but this is because it's a job you love. //39_F
- //Exactly. So at the moment I am accused of leaving work early and that I am not working every weekend, but I mean, what do you want to do there? You cannot be sick all the time too and work 100 hours per week. We all work between 60 and 80 hours. At some point you cannot do that anymore. //07_F
- *I think really think that there is a mindset of “do not complain, just work hard”. I think there could be some improvement*. 51_F

This new normality of flexibility and overworking at the very same time may also have a negative influence on social relations in a workplace as according to some interviewees researchers start to assess each other in terms of their involvement and presence at work.

- *And in my group, with my PhD and the people I work with now that's what's expected. I can give an example. I think this is reflecting very badly on me in terms of (laughing). But for example, if you have to submit something to a git or a repository, maybe you would do it later in the evening. You might have finished it earlier, but commit it later, because then it is logged. You've done it at some time which is outside of the ordinary working hours so it looks maybe like you've worked outside of your working time. I might even tell PhD students that sometimes you know just wait a little bit, log it a bit later, it looks a bit - you know.* 10_F

The second understanding of **flexibility** means that a physicist has to **adjust his or her career and plans to the academic market**, for example by accepting a possibility of changing a workplace after having a short-term contract, being mobile in general (see the section on Mobility, migration…), living in instability in terms of a job contract, a need of self-financing by applying for research grants. Such flexibility most often appears in the realm of younger scholars, for whom post-doctoral programs shape their career paths.

- *Now, for the start, it´s temporary for one year. I believe […] they never know how long it lasts in a spin-off. Because they recently hired me, […] the order situation must be good. Well, they are sure that it is enough for one year and then we have to see what´s after. I mean if there are more offerings they will renew my contract. If there are no other orders I have to find something new. But I believe for the change from science to //*industry is it kind of good to be in a spin-off, because I get all steps from the beginning, the whole workflow. That´s what I like, therefore I decided for it//. 22_F
- //(…) I can imagine that when someone works in an experiment, it can be stressful, or there are such situations, related to obtaining a degree. Even when an experiment has to be done to obtain PhD and it is delayed because there is something wrong with the experiment (…) a part of apparatus breaks or something else goes wrong, and this can be stressful. As far as theoretical physics is concerned stress is related only to competition, it means that before one gets a permanent position, there is this system of post-docs, (…) after the doctorate one goes on two-year or three-year post-doc and stays in one place in the world, and then in another

place in the world and tries to find a permanent position and this can be very stressful and this can influence family relations. //54_M_L

These two understandings of flexibility may influence psychosocial aspects of the physicists' well-being as they were often described as stressors in every-day work life.

Evaluations of the work environment

The work environment in the report is defined primarily in relation to the main characteristics of social relations, hierarchies and interactions between an employee and an employer, as well as among researchers. It also includes a social atmosphere in the workplace and a presence of the stress factors and their impact on individual well-being. Given the importance of individual well-being for pursuing a career and for work and personal life reconciliation, psychosocial facets of interactions with colleagues and supervisors seem to be crucial. Although the majority of the interviewees support the very idea of collaboration, some of them reveal certain tensions emerging between perceiving a career as something achieved together, through close and intense cooperating with each other, and seeing a career only through individual goals and achievements. It was underscored that in spite of an official demonstration of collaboration, in fact everybody “fights for their own position”.

- // I would say yes, really, not necessarily openly. But of course there is competition, because everybody is on - most people are on short-term contracts. And publications are what you need - I mean in my group we don't really publish enough and we are not pushed to publish as much as we should. […] Which will be problematic for the future. Ehm, the other half of our institute. The more data analysis-based side. They publish a lot more. Sometimes you hear about things, like, oh, this person has published this thing and I was, they were working on it more. You hear little things, it is not as open as 'I hate this other guy' or whatever, but it's a competitive world. You are supposed to be working together, but ultimately, everyone has to fight for their own position. //10_F
- //So, basically I mean I have my own task that I want to get done. //14_F

Such reflections led us to think how physics is perceived by the interviewees in terms of collaborative vs. individual dimensions of their work and to what extent this profession is based on competitiveness.

Various aspects of team work

Close collaboration was often perceived as an essential characteristic of physics due to the experimental aspect of the discipline present in many interviews. Some of the interviewees underline that this aspect of work springs from the core of the physics research to which various people with diversified skills, knowledge and capacities have to be involved. Only theoretical physics is perceived as more individualized in terms of every-day work. Among positive results of the team work the interviewees mentioned knowledge and skills exchange, making contacts with other researchers, a possibility of joint publications. An additional value of cooperation within e.g. a faculty lies in building a sense of a community between physicists.

- *In the faculty is variously, generally I think we have the potential to work together and now as a person related to administration I think we do not use it everywhere, as a community we should not allow to be atomized and think only in terms of our own group, it is good to share some*

research, as we share part of the apparatus. 58_F_L

Besides such a formal collaboration related to research grant projects, some of the respondents shed some lights on informal, personal aspects of team work by showing an **importance of a good atmosphere in a workplace**. According to them friendly environments may enhance scientific achievements as well.

- *Every morning we take coffee together, with all the team including students or trainees. It allows us to discuss informally, to talk about personal or professional news, to see if everyone is doing well, if someone has difficulties. It is very important to keep good links in the team*. 35_M
- //We have very good relations, I won't say they are like family…(…) but it is very pleasant. //56_F

One of the characteristics of physics, often taken for granted, is the assumption about collaborative nature of the research work, especially in the realm of experimental science. A **level of cooperation is enhanced by the grant system which requires** close partnerships between different research organizations, but also often demands collaboration within one institution. Collaboration with external groups and institutions is usually evaluated positively and goes beyond the boundaries of the discipline.

- *We have a long tradition of partnership because the employees work together on a common project financed by EU.* 41_F
- //I succeeded - and this is what I consider to be a great plus of my profession - to work with both biologists, genetics, mathematicians, and so it was not always just physics. //58_F_L

Collaboration is also reviewed as an evident challenge in two visible contexts. The first one concerns personnel disputes in the group of researchers and the lack of systemic solutions to their mitigation. In this situation, the researchers often feel isolated and reluctant to make further attempts for cooperation. This also has a negative impact on their careers, because for this reason they give up, for example, the submission of grant applications.

- //I tried to apply for various grants, but it was also hard for me to get along with my colleagues from the group and I thought that when there are such big conflicts and argues at the stage of writing the project, I do not go into it. Well, because then the project has to be implemented and by whom? Also as if the specialization is quite narrow and I think it would be hard for me to find co-workers to replace my colleagues. //65_F

The second aspect concerns the impact of competing with each other during cooperation. For some respondents, competition is a part of a scientific career and is perceived as a “natural” part of the physicist's work. Such defined competitiveness refers to, for example, the number of publications, successes in obtaining grants and other scientific achievements. But the collected narratives also show the negative aspect of competitiveness, in which unjust behavior and actions occur. It is often forced by the systemic situation, for example when postdoctoral researchers compete with each other for permanent employment.

- //And now it is difficult, because even inside of the group too. We are 3 post-docs now and of course we all want papers, or course as a first author, because otherwise we won't get a position afterwards and then it is difficult, because there are no three experiments. And then one person is coming in a little earlier and the other one a little later and then it is a little bit like, who somehow shows the professor that they were there longer, to get it and then, and it happened to me a couple of times that people said 'Yes, I am going home now and so you can

also go home' and then the next day I learned that they stayed until midnight. And they really turned everything off, as if they were going home. And I mean what do you want to do in that case. So you can try to communicate and to ask 'what are you doing now?' and 'can we do that together' or something like that but when people say 'yes', but are doing it all differently anyways, then well. But I think that this is just because of the competition and that we are under such pressure. //07_F

When it comes to gender dimensions of collaboration, in the majority of the interviews this aspect of working together remained invisible in two ways. The first invisibility means that the respondents didn't mention any aspect related to gender and collaboration as they didn't look (consciously) at the team work through the gender lens. The second way concerns a situation in which gender was not perceived as an important facet of collaboration, but rather as a transparent factor.

- *I studied a lot with male students because they were the majority, but when I worked with females it was fine as well.. But it has not been uncomfortable studying with male colleagues.* 43_F

Only in a few cases this dimension becomes visible and perceived as influential. These situations often refer to conflicts and discriminatory practices ("*men think that we are stupid too"*) at the workplace. The following citation also shows that lack of sufficient language skills may lead to creation of an inner circle of people on the basis of their nationality/same language within a department or a research group. This can seriously hamper cooperation between researchers and intensify existing stereotypes.

- *I thought everything was okay [within the group] and then I found out yesterday (..) that the two men are somehow thinking as well, that both of us women - so we are the female professor and two women and two men - and now I found out that the men think that we are stupid too. [Interviewer: How did you find out about that?] Because the three others are basically speaking the same language. So the three foreigners are coming from the [foreign] country and are talking a lot more amongst themselves than I talk to them, because they do not speak English that well.* 07_F

Changing roles of the researchers

Both female and male interviewees underline changing roles and job description when it comes to being a physicist. Although not all of them experience teaching responsibilities (this applies only to academic positions with didactics), being a leader or having administrative duties, "a growing workload" appears in almost every interview. A broad sociological portrait of being a physicist emerging from the GENERA study reveals a growing plurality of roles and tasks faced by both young and senior researchers. The younger generations of physicists (e.g. during a postdoctoral program) underline that they do not have face too many administrative or supervision-related obligations due their positions within the scientific world. However, their fragile and unstable employment conditions force them to undertake additional research and publishing activities in order to ensure themselves a good employment in the future. Senior researchers repeatedly present their workload through the lens of responsibilities concerning a supervision of younger colleagues, teaching, administration, reporting and managing of research projects, and applying for research grants. Yet, some of them demonstrate their agency and autonomy in rejecting or avoiding some of the non-research-oriented tasks.

- //I try to avoid any additional duties in terms of administration or some special activity. I usually say no because I just want to focus on my research and I know it could be very diffusing. //63_F

Furthermore, the portrait is also diversified in terms of gender dimensions. Female researchers more often than men indicate a need for a greater appreciation and recognizing a value of teaching as well as accentuate challenges and difficulties related to reconciling their work with personal life. The overwork was discussed during the interviews in terms of three important contexts: administrative responsibilities, teaching and a new emerging role of a researcher, in which he or she becomes a manager.

Administrative responsibilities

As mentioned above, younger researchers usually do not complain about administrative responsibilities as they do not play a leader role in the institutions.

- *I devote all my time to my research. In my position I'm lucky I don't have teaching obligations or administrative issues.* 37_F

The problem of overload with duties becomes more visible in senior researchers' narratives. Dealing with administrative responsibilities (e.g. periodical reporting, counseling) leaves a little time for the research. Some of them perceive these tasks as somehow “natural” or obvious obligations related to their age and experience.

- //You have to involve a lot in administrative tasks, most of them quite bureaucratic, so your time for doing research became less and less. //76_F

Overworking with bureaucratic tasks concerns as well managing research projects, in which principal investigators are not only responsible for coordination and conducting inquiries, but also for meeting all report-related expectations. While in some cases the research organization may offer sufficient support in project management, in other the responsibility is shifted to the researchers.

- //I've managed EU funds some years ago and was a lot of work also because often I did not have much support from my administrative office. Now I've no more funds to manage and my work is much more relaxed. //40_F

Teaching

The issue of the excessive workload appears not only in the context of administrative responsibilities but also in the realm of teaching obligations. A number of the interviewees demonstrate a lack of balance between time devoted to teaching and to conducting research.

- //You must give compulsory teaching time at university. Here it represents more than 200h of courses to give in the year. Not to mention, of course, the preparation or the corrections. This represents an enormous investment of time and energy. I like teaching, but 200h? I think it's disproportionate when you look at the time that goes by at the expense of pure research. //35_M

Some of the respondents underscore the fact of teaching not being recognized as part of the scientific excellence. In a few contexts (e.g. Poland, France) being a teacher and a supervisor is presented as overwhelming, yet important part of one's professional career. However, successes and achievements in this regard, are often not included in regular evaluations of the individual scientific accomplishments. Such situation has been named by one the research participant as “schizophrenic” - on the one hand there is an organizational demand regarding teaching, and on the other scientific

achievements embrace only (or mainly) research-related activities.

- *At the moment, I slaughter myself a little. I was able to find some two free weekends lately, but in general I have no vacations, no holidays, I just sit from morning until night, often turn off the lights here [at the Institute] (...), so I work a lot, dozen hours or so a day to get things done, but in fact it's not something I have in my job contract, because in contract it is [written] that we are paid for didactics, but evaluated by scientific achievements. And this is a bit schizophrenic in being a scientist in [name of a country]. Most of the tasks I impose on myself independently. Unless, there is some scientific cooperation, somebody subcontracts me some research, and then - you know - I have to do that.* 55_F
- //I enjoy my activity of dissemination [teaching in schools]; it gives me a high personal feedback. Nevertheless, I regret that nothing is recognized about this activity. It is an intellectual challenge. //49_F

It is worth noting that in some contexts (e.g. in Poland) it's impossible to receive a professorship only in didactics, although at the same time a great involvement in teaching is demanded.

- *One and only weak point is that (...) practically [here] it is not possible to make a habilitation, even a PhD in didactics of physics, chemistry and biology (...).* 56_F

Researcher as a manager

A repetition of the narratives, in which the interviewees accentuate a shift in a role of being a researcher allows us to claim that due to expanding bureaucracy in higher education systems and research institutions, financing research through grant systems, and relatively new science objectives (e.g. popularization or dissemination of the results), physicists as other professional scientists have to face **proliferation of roles and new management accountability**. Such situation reveals that physicists more and more often become managers as they are obliged to manage working time, teams, financial resources and their own careers (cf. Sinderman, 1985).

Such changing role of a researcher leads to many tensions appearing within a role itself. The researcher is no longer just a researcher or a scientist. She or he has to learn new competences and skills related to e.g. project management, paper work, cooperation with business etc.

- *I've complained to the high level direction about a terrible fact: the working conditions deteriorate every year due to the explosion of administrative tasks. Between databases,*

business sheets, missions, budget, holidays management... I really have the impress to be a secretary, I have a huge frustration to have made 8 years of studies to finally do administrative tasks, or even low level secretary tasks, just fulfill papers and papers. 34_F

- //In my personal case, the bureaucratic aspect is increasing and it has required new competences: I am attending a project management course. //50_M

Some of the interviewees underscore that in spite of multiple obligations, they have a certain capacity to organize their working week in a satisfactory way. More nuanced analysis shows that it is related to both regional contexts and character of the workplace (whether it is an academic institution providing teaching or a research organization).

- *My professional career is diverse: I do research and I also do management tasks. To some extent I can decide how much work I put in each of them and the combination is satisfactory.* 32_F

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