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4. Networks

Introduction

Sociological research shows that **membership in scientific and science related networks influences women in a bit different way than men**. For female researchers “benefits gained from membership in networks include the ability to build social capital, promote new contacts, professional socialization and emotional support”, while male researchers underline first and foremost instrumental benefits for their own careers and rarely mention emotional aspects of it. The networks may have different forms and goals - e.g. as it is shown in the chapter about mentorship, informal support given by colleagues from work could also be sometimes considered as a way of networking. Other visible forms of associating could be: mixed gender networks, female only networks, networks dedicated to one (sub)discipline or for one region. When it comes to both formal and informal participation in such structures, not every GENERA study participant belongs to a network. Their evaluations of the benefits coming from the membership, usefulness of the networks and their importance for career development provide us with a complex picture of the contemporary networks accessible to physicists as well as various definitions of a network itself. The most crucial reflections regarding formal and informal structures and groups of support present in the collected interviews are:

- Mostly young and female researchers declare their membership in networks, more often than male and senior researchers, leaders less often than non-leaders;
- Young and senior researchers present different arguments when it comes to their reluctance to be a member of the scientific networks. While seniors are usually preoccupied with their job responsibilities and do not have enough time to engage in networking, young scholars often have to deal with a fragile sense of belonging to the workplace caused by short-term and unstable employment. Their fragile positions make them reluctant to joining the networks (as they feel out of place), but also eager to create new ones, that could assure them a sense of belonging;
- Although networking by joining formal local and international networks appears in the narratives, in most cases networks are defined as informal and discontinuous collaborations between researchers and institutions (e.g. through research grants);
- Very few women declare being a member of **women's scientific network**, and none of the men in a role of a formal supporter - as they declare gender being unproblematic for them;
- Male researchers more often are not concerned about **scientific women's networks** as they perceived them as solutions for gender discrimination problems rather than science development oriented. **Female scientists are more gender aware and valuate the importance of those networks for being able to talk about same topics, because of women's openness when compared to men's** (alternative for old boys club); women perceive the networks as beneficial and needed place of support and exchange of ideas.

Reasons for networking

Although networking is often considered as “a must”, different definitions of it show more nuanced vision of reasons for becoming a member of the networks. For some physicists being part of the network has in fact **very instrumental character** as it provides them with access to journals, information about conferences and scientific events, new publications and funding possibilities etc.

- // It helps me to progress in career, give some allowance to participate at important conferences and access to journals////. //77_F

The most common reason for creating, developing and belonging to the networks, sheds some light on the essence of the scientific work. For the majority of the interviewees **networking has rather informal character** and is related, at least to some extent, to **the core of physics** - a necessity of building teams comprised of researchers with different skills, knowledge, approaches and access to equipment requires collaboration with various research centres and laboratories around the world. In other words, physics as a discipline due to its basic principles (e.g. experimental work) implies participation and involvement of diversified specialists, researchers and theoreticians (see also section on “Work conditions and environment”).

- *Belonging to a network was fundamental for the development of my career in this field.* 44_M
- *Research according to me is international. Small experiment does not work anymore. What we need is strengths from different countries.* 46_F

Such collaboration and building informal **networking is often facilitated and intensified by research funding programs **which imply close, often international, cooperation between teams. In order to receive funding for an inquiry, it is necessary to build an international consortium. Important here is that participation in one program or project triggers a possibility of collaboration in the future, that is why being part of any network, even informal, is so essential for the researchers.

- //I consider the collaboration as a network: we are all working in the same project, of course, but not only, so we are implied in other projects. We can exchange a lot about different subjects and it's very interesting. //33_M
- *Being an expert in evaluating programs from [abbreviations of research founding organizations], it certainly helped, because the appearance of such an expert implies that people associate that there are people coming from such country, and perhaps it is worthwhile to reach for these resources that are different from ours, and sometimes it directs people to other groups that can decide on developments or directions.* 58_F_L

Other research conducted among physicists almost three decades ago shows that informal networks operate according to several crucial characteristics. Firstly, such networks imply regular contacts and sharing information of research progress. Secondly, being part of the network provides, creates and sustains a professional identity. Thirdly, “they [networks] provide contacts with people 'at the cutting edge', and so indirectly enhance one's own reputation and career prospects”. These aspects are as well visible in the GENERA study which reveals another important facet of networking - it shows that **participation in physicists' networks intensifies mobility** opportunities and strongly supports research exchange.

- //The Xxx network is mainly about solving certain problems, there is always a scientific problem to study within this network, but its primary goal is about contacts, about meetings, exchange programs between laboratories, from time to time there are some bigger events. So fore and

foremost it aims at mobility. //72_M

As mentioned above, the research participants value primarily **informal networks - **non-institutionalized collaboration between researchers and/or institutions (including external laboratories) is seen as most valuable for knowledge and research(ers) exchange. Such understanding of networks sheds some light on a possibility of scientific exchange regarding research methods and approaches or of joint publications.

- //You must belong to different research groups, have different professional contacts and collaborate with many people. //24_F
- //I enjoy getting to collaborate with different people across the world. //03_M
- //As member of a big collaboration, I had the impression I had enough contacts with a lot of researchers and didn't feel the need to connect with other ones. //34_F

What is important here is that collaboration is also seen as a **significant career pusher** in terms of gaining prospect future job contacts. For young physicists their belonging to such structures often depends on the contacts of their supervisors, as they usually introduce their mentees to the research world (see section on Mentorship).

- //[Prompted about whether networking is more commonly done informally] Yes, exactly. Those are actually. With the network, that is rather with your PhD supervisor. (…) when your supervisor has a lot of collaborations during your PhD and he sends you to conferences frequently or on work trips or something, then you simply get to know a lot of people. And then the probability, that one of these people—when you do good work—gives you a job, are really high. //07_F

For women (including those performing research in emerging fields[1)]) formal networks are important in developing one's career. Some of them declare their willingness to join women's networks for achieving gender equality, but also perceive them as "**career pushers**". It's not always valued positively by them as it is sometimes perceived in terms of special treatment.

- //I've never been part of this kind of pushing career network, because that's the point isn't it? I don't think I want special treatment. //37_F.
- //It is very important having a real and wide network because you should have much more opportunities, but I don't know if I have it. //43_F.
- //I would say that cooperation and conferences promotes, there you meet people and when you talk with them then… and you keep in touch with them, then it promotes you. //22_F

Networks positively influence individual recognition and help to **develop and sustain a professional identity**. The latter means that it helps to unfold an individual identity as a physicist and strengthen existing bonds with a discipline and research organization.

- //The first network didn't play any important role [in my career], but the second organization, although it didn't help me in my scientific development, undoubtedly contributed to my recognition [as a scientist]. //70_F

Finally, physicists join networks because of a possibility of getting **external funding support** and coverage of access to different sources of information.

- *In this network, to which I made our institute join, there is a special program for women, in*

*which a female researcher can get 1000 euro to go to selected laboratory, //*present herself there, so she has a presentation, talks about her research, about her scientific plans. And that's something I will try to introduce next year, I mean I would like to organize it this way that each year one woman from our institute could go. //65_F

- //It is helpful because it gives you access to mobility, publications and other resources. //75_F

Challenges related to becoming a member of formal networks

Physicists sometimes decide not to participate in any formal networks or belong only to very few structures during their entire career. Such attitude can be caused by several different circumstances. For some of our respondents, **informal contacts** are more fundamental in their work than formal membership in a research institution responsible for associating researchers. In other words, the fact of a lack of any formal network membership does not mean being isolated from the scientific community. Other reasons for rejecting individual engagement in the nets are related to:

**significant lack of time **

It is underlined that such networks are important for young researchers, but senior physicists and those in leading positions perceive these support structures in terms of additional tasks to be fulfilled and do not want to be part of it due to lack of time.

- //I'm already part of the [name of physics formal organisation in a given country] and from international collaboration, so I don't really need to have other opportunities to meet people... And I don't have the time! //35_M
- //No, basically I didn't have enough time or opportunities to develop myself in this direction. I've never been active in this. //68_M_L
- //It was useful when I was a student, it opens doors. No, I do not have time anymore. //79_M

**lack of funds (e.g. for fees) **

Another visible circumstance that hampers becoming a formal member of scientific networks concerns **a lack of funds** for paying fees or ensuring participation in the networking meetings. This problem is particularly visible in Polish context where universities or research institutions rarely guarantee financial resources for such activities. Paying fees from one's own salary is not always an attractive alternative for academics.

- *Well, unfortunately, all my ideas always have this question in the background: what is the price? How much I have to pay? Well, [I'm wondering] how much I can contribute from my own salary, really, my wallet is not made of rubber.* 65_F
- *However, it is very important because you can meet people, so it was probably the first association I signed up for, and then I signed up for many other international ones, but also because these fees are quite expensive, I gave up.* 60_F

feeling of instability resulting in feeling of lack of belonging

Another challenge related to becoming a member of scientific networks concerns **precariousness of the employment**. Young researchers, who do not experience **a sense of belonging** to their research institution as they are hired only on temporary contracts, find it difficult to become part of any network. Such temporary employment and uncertainty connected with it can significantly hinder

developing of a sense of commitment to the scientific networks. On the other hand, informal contacts are often used for overcoming precariousness and finding a permanent position.

- //And now, for example, when I go back to Xxx [name of the country], I do not know anyone. That means the chance, so the probability, that I find a job is practically zero. Because everything works with like insider relationships [Old Boys Networks, but it is not clear from the interview that this is what was meant exactly]. So you will never get in if you do not know the professors, if you do not know the group, if you did not study there. Everyone knows that. So that means if I want to go back [there], I even have a disadvantage, because I did my PhD abroad. //07_F

lack of scientific network culture and language skills (cultural differences)

Not being a member to any formal network also relates to **cultural differences**. This issue is visible in the interviews conducted with researchers having migration experience from countries, in which formal networks are not perceived as important for a career or scientific development. These culture differences can be also reinforced by difficulties related to language and communication processes.

- // "[I: Are you a member of any formal network?] No. (…) [I: How come? Why are you not a member?] So, I think there is not so big culture of this membership in Xxx [name of the country] and then, when I moved here I also didn't feel any obligations to be a member of this. And I am also not so - so one point of this membership is that you get that kind of [unintelligible], but I am not so good in Xxx [language that is used here], so it is not so useful for me. For their meetings you can go without being a member also. //11_M

lack of knowledge of their existence

When it comes to women-only networks, the majority of the research participants do not have enough knowledge about them to become a member. This suggests that such networks are still not recognized among physicists in various regional contexts.

- *I don't know a network specially for women scientists. But if there was one with interesting actions, I could join it.* 36_F
- *Frankly speaking, I've never met with such networks [for women in science] before. //*I have not received any information. //64_F

gender stereotypes/discrimination

A direct experience of sexist culture, gender stereotypes and discrimination may result in developing a distant attitude towards scientific networks, which are sometimes depicted as sexist, exclusionary and based on internal hierarchies.

- *It is just simply the case, that when one of those old professors, maybe in his mid-50s, it is pretty okay, but you cannot go to young group leaders or something like this. So, it is really quite weird. When you approach group leaders as a women, who are already, who are successful and you are still young and have no idea and then you just go them and want to introduce yourself, so to say. Except when you have a really //*good question and then the guy thinks, oh, you are smart or something like that. But, I mean, if you just generally want to talk to him or just like that, it is super difficult. [Prompt: Why? Why weird? What happens?] Either they think "Oh, what does she want from me?" or they think "Yes, what does that bimbo there want? She is not able to do anything anyways" or they just look at how you are dressed//. 07_F

Women-only networks

As mentioned in the previous section, one of the challenges related to women-only networks concerns their recognition among physicists. Organizations and structures supporting female researchers often remain unknown and unfamiliar to the researchers.

However, knowing such organizations facilitates supporting their development. The majority of women having experience of being a member of such structures, **evaluate them positively**. The networks for women in their accounts are supposed to:

- promote gender equality;
- create safe spaces for women (outside of sexist culture);
- help to gain visibility;
- enable to share similar experiences.

- //I was member of Xxx [name of a women-only organization], at Xxx [name of the institution]. I'd like that once a month women get together and spoke about their issues. //77_F

- //I think it's very important, it's a crucial point for the gender equality, to promote the presence of women in science. I would support this kind of activities if there was one in the laboratory. //36_F

- //And that, so this Xxx [name of a women-only organization] I think is a good thing, because you can just, so you can, the approaching is simply way easier, much more normal, more professional, so I don't know how to say it. Because there are no weird sexual or misogynist ulterior motives. //07_F

In few cases an i**ndividual attitude towards women-only networks is shifted due to personal experience of e.g. becoming a mother**. While before such experience female researchers did not include gender sensitive perspective to their work, having a family helped to frame their experiences through lens of a need for systemic actions and solutions for gender equality.

- *Before I was more in an individual approach, where the sex of people was erased and where I was concerned only with skills. Since I had my daughter, I have begun to ask myself a lot more questions about the professional world in which I want her to evolve later. So I think this kind of networks to promote gender balance is really important.* 34_F

Not every female and male interviewee underscores a need for such networks. For some interlocutors, creating a network or an organization only for women could introduce an additional ”**unnecessary division**“ among physicists. Most often such opinion is supported by the conviction that in physics there is no inequality between men and women, and the disproportions in their number result from certain objective premises. The idea of supporting “talents, regardless of their sex” is also mentioned in this context.

- //For me it [the networks for women] is about showing unnecessary divisions. I see that in physics we have more equal treatment in various behaviours, on different levels, than in other disciplines. I guess that such [equal] approach could be caused by a small number of women. //66_F

- //I haven't heard of them, but I don't think I would like [to belong to them], because I think, that it is necessary to support talented persons and not necessary women, I mean, regardless of their sex, (…) I think it is necessary to support talents generally, but not aim at women only (…). //53_F_L

Female researchers underline as well an importance of informal women's networks, which they build using their contacts with other female physicists. Such networks help them to develop social spaces in which they could feel comfortable.

- //So for instance I have a very good female acquaintance, who is in a similar position like me and, exactly. I have as well met her at a conference and so on. So, and that is actually really nice, to always meet her again and exchange with her. Especially because we are both women and, yes, I find that somehow you have more things in common and you have completely different topics somehow, that you talk about, as compared to male colleagues or so (laughs). So it is a little different. //06_F

However, some of the female respondents present a very distant attitude and underline that they do not feel comfortable in such female networks as it is about “sticking together [in a pejorative sense] and general building of such a narrative that »we are better here than the others who do not have children at this age and those who do not take care of children because it is well known that guys they do not take care of children, of course«” [66_F].

next

1)
By emerging subfields we understand e.g. combining physics with biology, medicine and technology.

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