



UNIwersytet im. Adama Mickiewicza w Poznaniu

RESEARCH RAPORT

AREAS OF SOCIAL INEQUALITY AMONG SCHOLARS AT THE FACULTY OF MATHEMATICS AND COMPUTER SCIENCE AND THE FACULTY OF PHYSICS, ADAM MICKIEWICZ UNIVERSITY IN POZNAŃ

RESEARCH CONDUCTED AS PART OF THE PROJECT
WHEN SCIENCE IS A WOMAN

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I. Description of research

This report recapitulates findings from a survey conducted among male and female staff in scientific, teaching and research positions at the Faculty of Mathematics and Computer Science and the Faculty of Physics, Adam Mickiewicz University in Poznań. The adopted objectives have been accomplished as part of the Polish-Ukrainian project *When Science is a Woman. Factors Determining Women's Scientific Careers in Poland (AMU) and Ukraine (CHNU)*, funded by La Fondation Paris-Dauphine.

Objectives of the study

The aim of the project was to explore the domains of work and family life of persons participating in the study in order to determine statistically significant impact on the professional standing of women and men. The core goal was to determine those areas in which social inequalities can be observed and establish where those inequalities stem from.

The principal hypothesis was concisely formulated as follows: the professional situation of women working in scientific positions and the faculties in question differs from that of men. This difference may be attributed to socially and culturally shaped and sanctioned patterns of social advancement, which differ for either gender, with apparent equality maintained in terms of formal and legal criteria.

The analyses conducted sought to identify the areas in which such inequalities occur. Empirical verification relied on the results of statistical analysis of compared variables which describe professional and social situation of women and men employed at both faculties.

Research procedure

Survey-based research was launched at the Adam Mickiewicz University on 17 February and completed on 28 March 2021. This was preceded by a pilot run of the adopted research tool, a CAWI online survey. Information about the survey along with the address of the website through which it could be accessed was distributed among research, teaching and scientific staff at the Faculty of Physics and the Faculty of Mathematics and Computer Science.

The aforementioned research tool was based on the survey questionnaire developed by the international academic community GEAM (Gender Equality Audit and Monitoring). It has been structured in a way which fully respects and safeguards the privacy of those taking part in the survey. So far, 12 universities and research centres in Central Europe have used this tool. In its final form, it includes 76 survey questions divided into nine problem sets and a quantification component showing the distribution of basic socio-demographic characteristics of the respondents. Online application LimeSurvey served to perform the measurements.

Population

The population of all research and teaching staff of the two faculties comprises 232 persons, of which women constitute 20%. Professors account for 61% of the population, with 13% being female. In the group of assistant professors (39%), every third member of the staff is a woman (31%).

Characterization of the sample

The research sample was N=39 persons, i.e. 17% of the staff employed at both faculties. Women constitute 39% of all respondents (N=15). Persons employed in professorial positions account for 31% of the respondents, of whom 17% are women. Assistant professors represent 69% of those participating in the survey, of which women account for nearly half (48%). The sample composition included 61% males, while the average age of all respondents was 43 years. The youngest respondent was 28 years old and the oldest 68 years old.

Research team

The research was conducted by a team whose members represent the humanities and social sciences, including dr hab. prof. UAM Grażyna Gajewska (head of team), dr hab. Iwona Chmura-Rutkowska, dr hab. prof. UAM Edyta Głowacka-Sobiech, dr Maciej Kokociński, and mgr Katarzyna Wala.

II. Social, cultural and organisational factors affecting implementation of the quality policy (principles of equal treatment) in the opinion of persons employed at the AMU Faculty of Mathematics and Computer Science and the Faculty of Physics

Part One: Employment structure at the AMU faculties—analysis of current data

Computations concerning employment structure constitute "hard" data, independent of the sample selection or the manner in which survey questions are asked. As such, they are an important point of reference in the interpretation of the survey results.

The analysis of the current employment figures by gender as of March 28th, 2021, showed that— for all academic teachers at the AMU—gender representation is relatively equal, with 1,441 women (48.6%) and 1,526 men (51.4%)¹. Differences become apparent when one considers specific disciplines and employment at particular faculties. A distinction has been made between faculties which employ more/less than 50% women, those with a balanced gender distribution and those with a predominantly female workforce. The faculties in this study are among those AMU units where women constitute less than 50% of the staff.

Another vital dimension of the analysis involves comparing respective proportions of women and men holding a particular position. The post-doctoral degree was chosen as the reference point, with the assumption that it is likely to demonstrate evident differences. (Tab. A).

¹ Employment data used in this analysis have been collected thanks to courtesy and effort by the AMU human resources department. Women like to express our particular gratitude to mgr Ewa Nawrocka.

Tab. A. Employment structure at the analyzed AMU faculties in terms of promotions to the postdoctoral degree

Faculty	% of women with doctoral degree	% of women with postdoctoral degree	% women with professorial title	difference between % of women with postdoctoral and doctoral degree (-decrease, +increase)	difference between % of women with postdoctoral degree and professorial title. (-decrease, +increase)
Physics	35%	23%	5%	-12%	-18%
Mathematics and Computer Science	33%	15%	0%	-19%	-15%

In the table, the first column reflects the proportion of women with a doctoral degree, the second column with a postdoctoral degree, and the third column with a professorial title. It clearly follows that women are significantly underrepresented among independent scholars at the analyzed faculties. The middle column in Tab. A. shows percentage differences indicating an increase or decrease in equal gender representation with respect to professional promotion. Comparative analysis of the data presented above demonstrates that the Faculty of Mathematics and Computer Science and the Faculty of Physics are among the AMU units where female staff find it most difficult to be promoted.

In conclusion, the most significant discrepancy in the proportion of women holding a given scientific rank is seen between the doctoral degree and the postdoctoral degree. Negative values of this index are indicative of a significant problem in implementing equality policy. It appears that women are less willing and/or able to advance to the postdoctoral degree. Insufficient degree of institutional support for women maybe one of the reasons behind such a state of affairs.

Part Two: Working conditions—recruitment and promotion

Computations show that men are more often encouraged to apply for promotion (79% of the respondents) than women (46% of the respondents). Women were more

frequently promoted having met the requirements of the competition procedure (63%), with 43% of their male counterparts succeeding. Men are relatively more often promoted through appointment, i.e. outside the competition procedure. Among women, as many as 91% have not yet assumed any executive functions, whereas the equivalent figure for men is 70%. Also, none of the women have held such a group positions outside the AMU.

As regards earnings, no statistically significant differences were noted, with the average net salary of AMU amounting to approximately PLN 5,600.

No gender disproportion has been observed in contributions as a reviewer for international journals, but differences do occur in the case of domestic journals. As many as 59% of men declare undertaking such commitments, whereas only 30% of women do likewise. On the one hand, this may reflect women's reluctance to devote time to activities that are less prestigious (or may translate into career points), while on the other it may result from limited opportunities to review papers of national scope.

Men are also slightly more frequently elected as board members of international and national scientific societies or associations. However, it should be stressed that the group of male respondents included more titular professors, which indirectly translates into such distribution of responses. Out of the entire group of 39 people taking part in the survey, only one in three women has obtained a grant. In the case of men 14 persons, i.e. every second scholar, succeeded in a grant procedure.

Analysis of the criteria involved in promotion proves that only in one case did any statistically significant differences occur. Interestingly, this does not concern the formal aspects (number of publications, participation in conferences or managing scientific projects). The sole dimension where variation is observed are personal contacts with AMU staff prior to obtaining a position, i.e. the social capital held. For men, the average importance rating for such contacts was 3.9 on a 5-point scale, whereas women rated it at 2.6. It is also interesting to note that women in the sample received slightly more awards and distinctions for their work for the university (12% more women in this particular group). This disproportion is due to a greater number of awards in recognition of teaching and organizational work.

However, given the relatively small sample size (39 persons) and the structure of the surveyed faculties (predominance of men), such a result may be argued to stem from

social inequalities in operation. It is likely that this situation leads to a resurgence of existing inequalities in the subsequent generations of scholars. This is due to the fact that the social capital² possessed by men is "passed on" in a sense within particular departments in a peculiar fashion. It bears some similarity to the patriarchal pattern of sharing responsibilities in traditional families. In other words, the mentor conveys his own stock of social capital to his colleagues, men in the main. Therefore, the latter recognize that social capital to have a higher rank. Additionally, men have a greater culturally defined ability to convert that social capital into assets such as points, certificates or other documents which constitute a major formal dimension of applying for promotion. The intensity of this phenomenon is difficult to ascertain, but it is indeed a symptom of a relation which to some extent sanctions the existing configuration of social inequalities in the surveyed group of respondents.

The survey questionnaire also asked about the subjectively perceived ranking of factors which play a role when a promotion or appointment at the AMU is being decided. Here, equality-related issues such as guaranteed childcare, employee network initiatives to promote equality or an attractive training system proved to be the least significant (lowest mean score). Flexible working hours and no required relocation were graded the highest; the foremost criterion when seeking promotion was meeting formal requirements for a given position.

Another question was concerned with whether men or women find it easier to be promoted in the hierarchy. After conducting Student's t-test to compare mean scores obtained in the group of men and women, it was demonstrated that women statistically significantly ($p < 0.05$) rated the chances of men higher by 0.7 on a 5-point rating scale.

In addition, survey participants were asked to describe their own individual experiences of inequality in relation to promotion. The responses emphasized that the responsibilities of motherhood are not taken into account when evaluating women's academic achievement. In addition, it is widely acknowledged that teaching is the principal domain of female academics, and that academic achievement (number of points accumulated) is the sole relevant criterion in promotion procedures.

² The notion of social capital is defined in accordance with the concept advanced by Pierre Bourdieu, Bourdieu P. (1986), *The Forms of Capital*, in: *Handbook of Theory and Research for the Sociology of Education*, J. Richardson (ed.), New York.

Another issue addressed in this study was the extent to which respondents agreed with stereotypical statements describing the professional role of an academic staff member in conjunction with social inequalities. The respondents concurred the most (3.27 on a 5-point scale) with the notion that family life is an obstacle to professional success through one's work, expressed in the statement "To be successful, family life cannot be allowed to interfere with work."

In summary, gender inequalities are not conspicuous in the case of formal criteria relating to promotion or position. However, informal issues such as networks (social capital) are relevant not only when applying for promotion itself, but also in the initial assessment of potential success in that respect. Importantly, it is not that women are altogether denied the possibility of advancement, but objectively they are subject to higher requirements. This is because it is more difficult for women to meet the formally required criteria by relying on the informal ties.

Part Three: Biography

In the survey conducted at the Adam Mickiewicz University in Poznań, additional questions (distinct from the surveys in other locations) were included to find out why one chooses a scientific career path. The moment of taking the decision to embark on such a career is an important prognostic of its further development. It turns out that among men, there was a slightly higher percentage of those who already had such plans before starting their master's programme (47%). In the group of women, plans related to a scientific career took shape only during studies (64%) whereas only 27% contemplated it prior to studying. These results do not demonstrate a statistically significant difference. However, it would appear that men are to a greater degree socialized into the role of a scientist at earlier stages of their lives. The respondents were presented with a list of factors which, in their opinion, influenced their final decision to embark on a scientific career. Consequently, statistically significant differences in average ratings made on a 5-point scale were noted only for higher social prestige associated with academic employment. Men rated this factor higher (3.4) than women (2.20).

The envisioned date of having a child was an important criterion in choosing academic career. In the surveyed group, a child was had at the average age of 30 and it may be

noted that this age does not differ for men and women. Statistically speaking, women employed at Adam Mickiewicz University decide to have a child two years later than other women in Poland.³ Additionally, the average age of female respondents is over 40. The moment when the first child appears in the families of the staff is correlated with their professional situation. On average, a child is born after two years from employment, assuming the latter takes place largely upon completion of the doctoral studies.

The survey featured questions about persons who support future employees in their decision to start a career. The types of support included applying for academic promotion, grants, conducting research or work on scientific papers. Gender inequalities were taken into account in this case by asking survey participants to indicate whether such persons were male, female or both. In this respect, more than half of the answers did not indicate gender differences. However, when comparing other categories of answers it turns out that only one person reported assistance from a woman in one dimension, namely in grant application procedure. In other cases, assistance was offered only by men (approximately 45% of all possible answers).

Thus, the matter of unequal gender representation among scholars should also be considered in a broader context, going beyond the moment of employment or promotion. Gender inequalities have a social dimension and happen to be involved in the very decision to embark on a career of a researcher, if only—or perhaps above all—in the support provided by the academic staff (supervisors) to young researchers as they make such a decision.

Part Four: Culture of the organization and the working environment in terms of gender equality

Opinions concerning inequalities at the AMU differ for men and women, also in the assessment of their intensity and the areas in which they can be observed. Statistically significant differences were noted for general assessment and institutional commitment to pursuing equality policy. Men indicate that in general women and men

³ Przybylska-Maszner, B., & Trosiak, C. (2011). *Uwarunkowania awansu zawodowego kobiet na polskich uczelniach*, *Przegląd Politologiczny*, 3, 167-183, <https://pressto.amu.edu.pl/index.php/pp/article/view/14943/14677>.

are treated equally (with 4.3 mean on a 5-point scale) and that the university is committed to promoting equality (4.3 mean on a 5-point scale). Women take the opposite view, assessing global inequality at 2.9 and effective implementation of equality policies at 3.45. In both cases they are statistically significant at $p < 0.05$.

The survey also inquired about the inequalities perceived in the division of professional responsibilities. The respondents were asked who is mainly entrusted with more or less prestigious duties. On a 5-point scale, 1 indicated delegation mainly to women and 5 mainly to men. Following a Student's t-test, it turned out that for most analyzed dimensions, men gain more promotion opportunities as a result of the division and this difference is statistically significant ($p < 0.05$). Higher mean scores were recorded in the female group who stated that men are more likely than women to be charged with responsibilities relating to:

- (a) holding senior or higher ranking positions;
- (b) access to informal circles of influence;
- (c) frequency of invitations to attend conferences, lectures, etc. or facilitating such participation (e.g. funding, extra time for preparation);
- (d) appointment to journal editorial boards, committees and panels, recognition of intellectual contributions at meetings, conferences, workshops, etc.;
- (e) project management roles (Principal Investigator), financing and providing funds;
- (f) award of prizes.

In all those cases, the differences between assessments made by women and men were approximately 0.7. They were most substantial in the case of opportunities of receiving positive feedback from superiors and having one's own intellectual contribution recognized at meetings, conferences, workshops, etc. (0.9). The former is particularly important for motivating an employee to take action aiming at potential advancement. Interestingly, the reverse trend, expressed in the opinion that specific duties are assigned mainly to women, was observed in only one area, namely assignment of teaching duties (difference of 0.9). This explicitly manifests the specificity of social inequalities in the scientific milieu, referred to in the first part of the report concerning the rules of professional promotion, i.e. "women are teaching and men are science".

Statistically significant gender differences were determined only in the lower (subjectively assessed) reported degree of administrative experience, as declared by women. What the respondents most likely imply in this case is managing research projects, grants or—more importantly—the fear of assuming executive positions, e.g. of a faculty head.

In the light of our analyses, it may be concluded that women have a less positive perception of their own salary and the motivating input from their superiors. The average score on a 5-point scale of satisfaction with earnings is 2.4 for women and 3.5 for men; as for the evaluation of the motivation system, the average is 2.3 for women and 3.4 for men. In other words, the number of professional duties in combination with family roles engenders the notion of unequal status among women relative to the professional position of men employed at the university.

Part Five: Mobbing, harassment, microaggressions

Only two cases of behaviour defined as mobbing were reported by the respondents. In addition to a direct question concerning such an experience, participants were also asked to rate situations in which mobbing or microaggressions could occur. Statistically significant differences in the assessment of the frequency of such behaviours between women and men were determined only with regard to the sense of being treated as a second-class citizen. Women are more often confronted with such treatment than men. Additionally, respondents reported on the willingness of their immediate environment to report incidents of mobbing or harassment at the workplace. The results show that 50% of the staff assess that readiness to be "very low" and "low" with 40% indicating the answer "difficult to say". Additionally, male and female respondents stated with regard to such occurrences and the willingness to report them that one's immediate superiors are the appropriate persons to turn to. This is a view declared equally by women and men.

Part Six: Trainings

Availability of trainings is another area where symptoms of social inequality can hypothetically be observed. In the sample, the only indication that such obstacles exist

was the opinion more frequently expressed by women that they do not have time to attend such trainings, especially given their very busy teaching schedules.

Part Seven: Balancing work with private and family life

Reconciling work and family roles is a key issue which both constitutes and illustrates the extent and the areas of social inequality among the scholars surveyed. However, those who decided to answer the final set of questions in the survey represent 53% of the total sample (21 persons). It follows from the obtained data that only 30 % of men have a child under the age of seventeen as opposed to 90% in the female group. Women with two children in their care predominate, but there are only seven in the entire sample.

The survey questionnaire included a question concerning the impact of the pandemic on the performance of professional duties by women and men. The lowest rating (2.4) was returned by female respondents with respect to the statement that the university authorities make it easier for women to carry out their professional duties. Conversely, statements formulated as "during the pandemic period it was more difficult for women than men to reconcile work and family life" and "during the pandemic period it was more difficult for women than men to fulfil their professional duties" received the highest rating. The average score in both cases is 3.6 on a 5-point scale, with 1 indicating a negative assessment and 5 a positive one. In the sample, only 8 persons took advantage of leave to take care of their children, of which 87% chose maternity leave. The duration of the latter is 15 months on average; other forms of leave do not enjoy much favour. This means that should the child be ill, parents prefer to take care of them in a manner which minimizes the need to take leave to avoid salary reduction or reassignment of responsibilities.

III. Specific recommendations for the Faculty of Mathematics and Computer Science and the Faculty of Physics

Make the criteria to be met in the promotion procedure more realistic, especially in the context of the culturally sanctioned requirement for women to perform mother or carer roles.

Provide feedback to employees, including their achievement and individual contributions to the faculty.

Ensure equal distribution of professional duties among men and women. Reduce the practice of delegating administrative and teaching tasks to women.

Encourage male and female staff to report incidents of mobbing, harassment, or microaggressions. Counteract the secondary victimization of people who have experienced such treatment.

Work to change stereotypes that having a family interferes with academic work.

In the course of periodical evaluation, take into account whether female or male employee is caring for underage children and allow for the related need of leave.

IV. General recommendations (for all AMU faculties) with respect to labour organization culture

In addition to detailed conclusions and recommendations for the authorities and staff at the Faculty of Mathematics and Computer Science and the Faculty of Physics, the research team have formulated general recommendations with respect to labour organization culture at the AMU. They are intended to respond to systemic challenges and inform long-term actions towards a university in which women and men, in all their diversity, will be at liberty to follow their chosen path of academic development, enjoy equal opportunities of advancement and partake equally in the university community.

Recommendations:

Mainstream the principles of equality between women and men in the university's policy and culture (gender mainstreaming); formulate regulations to counteract discrimination and violence as well as procedures to promote equal treatment in the strategic documents of the university; highlight equal treatment as an important issue for the entire academic community, not only for women.

Establish a collegial body/agency for equal treatment at the AMU (with delegated representatives in minor units/branches), which in a comprehensive manner—responding to various equality issues and challenges at the university—will monitor and develop equality standards based on research, as well as initiate discussion on inequalities at the AMU, sources of discrimination and the resulting problems.

Promote equal and inclusive language in internal and external communication at the AMU, stigmatize instances of contemptuous and hateful language; pay particular attention to sexist language in view of the enduring traditional mores.

Carry out a university-wide survey on the occurrence of negative, undesirable and violent behaviour within the organization, such as mobbing/bullying, harassment, sexual harassment and microaggressions, with due consideration for the numerous dimensions of diversity of the employees. Develop a long-term method for an ongoing monitoring of the problem.

Develop a participation-based (i.e. involving all actors in the academic community) and subsequently implement a clear, safe, prompt and ethical procedure for reporting,

intervening and resolving negative, undesirable and violent behaviours within the organization. Allow for the obstacles and resistance to reporting abuse due to rank subordination and the hierarchical structure of the university.

Propagate knowledge throughout the organization concerning negative, undesirable and violent mechanisms as well as alarming behaviours resulting from hierarchical, unequal relations, abuse of power in subordination-based relations.

Counteract stereotypical, gender-based assignment of administrative tasks and functions. When appointing duties and tasks, gender differences should be reduced, especially when it affects long-term career progression (doctorate - postdoctoral degree - professorship). Introduce a list of good practices enabling improved team management.

Develop the best possible strategies to help combine professional and family duties, especially at key stages of scholarly development. Develop clear communication concerning employee rights and the support offered by the AMU to parents. Promote flexible work modalities informed by the concept of work-life balance.

Encourage women as much as men to take up ambitious professional challenges. Being aware of stereotypes and social expectations towards women, ensure that women's voices and perspectives are heard and recognized as valid and important. Develop a support system for women aspiring to executive positions (mentoring, leadership training).

Recognize and value the sensitivity, awareness, competence and pro-social activities of persons employed at the university. Appreciate attitudes demonstrating responsibility for the well-being, fair and equal treatment of others, i.e. readiness to build a socially responsible university. It is important that the resources, skills and efforts in the domain of relationship management in a diverse team are noticed, respected and valued in real terms.