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**ADVERSITY
ENCOUNTERED ON THE ROAD TO GENDER DIVERSITY –
WOMEN AND MEN IN HIGH BUSINESS POSITIONS
AND IN SCIENTIFIC DOMAINS**

Gender diversity in STEM (Science, Technology, Engineering, Mathematics) fields, especially in business and in academia, has been gaining more and more attention among policy makers and the general public. The disproportion of female representation in these domains is still a significant issue. According to a European Commission (2018) Report the EU is approaching gender balance among doctoral students (47.9% female doctoral graduates) but women are still under-represented in the field of information and communication technologies (21%). When it comes to employment of highly educated professionals, women are more likely than men to be unemployed, even when they have tertiary education, and consequently only one-third of the EU's researchers are women. These numbers are even lower among business researchers, where the total number of female researchers is 20.2%. Also, in academic advancement we can still observe the phenomenon known as “leaky pipeline”, where the number of women decreases at each academic level: whereas the number of men and women with doctoral degrees is similar, there are almost twice as many men with habilitation and three times as many with professor's degrees (Młodożeniec and Knapińska 2013). Interestingly, the gender imbalance in financial grants acquisition is very slim, with a gap of 3% in the UE and a bit wider in Poland, where 43% of the funds from the National Science Center are awarded to women (National Science Center Report 2019: 3). It is worth mentioning however, that the amount of funding differs significantly between the sexes, with men acquiring 64% of available funding. Regarding the subject of equal remuneration, there is still room for improvement. As we can find in the European Commission Report (2018: 6): “In terms of equal payment, there is still a considerable gender pay gap in scientific R&D occupations. Across the EU-28, women in R&D earned on average 17% less than their men

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colleagues in 2014, and the gender pay gap was found to widen with age”. Moreover, a recent study of STEM graduates showed that as soon as six months after graduation, the pay gap between men and women is already statistically significant, even after controlling for the study major (Jaśko, Pyrkosz-Pacyna, Czarnek, Dukała and Szastok, under review). The same study shows that in comparison with male graduates, women are less likely to find a job, to receive more (vs. fewer) job offers, and to find a job consistent with their education.

Gender diversity is gaining the attention of business representatives, as the gap in some crucial competences (like computer literacy or leadership skills) are impacting staffing decisions in many organizations. The high-tech industry is growing rapidly, and a competent workforce is continuously in demand in STEM fields (National Science Board 2019). And since women are gaining appropriate levels of education the obvious question remains – why are they not more represented in STEM domains and in higher positions? This posits a practical matter of wasted potential of well-educated women who are now in such demand. Since gender inequality is inefficient and even potentially wasteful for organizations, some attempts are being made in order to reverse this trend. Organizations all over the world are trying to introduce more equality to their premises, and for this to happen, in-depth understanding of the reasons for the current state is crucial. Luckily, there is a vast body of knowledge that helps us to identify the potential mechanisms in play here. There are numerous influential theories and ample research providing insights into mechanisms at work in gender inequality in STEM (see Dweck 2007; Diekman et al. 2011; Cheryan, Plaut, Davies and Claude 2009; Dennehy and Dasgupta 2017).

The idea for this Special Issue actually originated during a conference devoted to gender equality in business settings: “It’s complicated. Gender balance in leadership” organized in 2018 by Diversity Hub, an organization focused on Diversity and Inclusion. Inspired by Professor Katarzyna Leszczyńska (AGH University of Science and Technology) and supported by Dr Tomasz Dąbrowski (Diversity Hub) the idea of an entire issue of an academic journal devoted to research and case studies on gender equality in science and business came to life. We opened the journal to sociologists, psychologists, cultural studies researchers, anthropologists, journalists and practitioners to share with us their work in this area. We received a broad variety of articles that tackled the notion from different perspectives and chose five articles that in our opinion provide the most interesting and professional contribution to the topic of gender representation in STEM and high business positions.

With this special issue we aim to further explore matters currently under consideration among researchers of various domains while simultaneously reaching out to business communities who are searching for evidence-based answers and solutions. The subjects covered in this issue are as broad and interdisciplinary as the problem itself.

The authors of the article *Why Does it Happen in Physics? Opinions of European Physicists on Gender Inequality* focus on perception of female underrepresentation as well as possible barriers that women may face in the domain of Physics in eight European countries (Germany, the Netherlands, Italy, Spain, Switzerland, Romania, France, and Poland). The authors conducted semi-structured interviews with physicists (both female and male) at different stages in their careers in various sub-disciplines of physics. Also, expert interviews were conducted with organisational leaders, including rectors, deans, directors, project leaders,

and HR experts from the same institutions. The results showed that interviewees are well-aware of the gender disproportion in physics, and the reasons for this phenomenon are sought out in various factors. Some participants raised the issue of upbringing, which discourages women from pursuing careers in science as a predominantly male domain. Others pointed towards female low self-esteem in science-related domains. A few comments also referred to “the natural” differences in interests and preferences, stating that career choice is a personal decision and that there are no objective obstacles to pursuing physics if one wishes to do so. In general, the authors found that interviewees were mostly prone to attribute gender imbalance in physics to ‘outside’ causes rather than the institution itself. The comment “this is how it is” speaks volumes about the commitment to this cause. These findings suggest that there are still many misconceptions regarding women misrepresentation in STEM and, what is more important, those misconceptions are oftentimes voiced by both scientists already in STEM as well as their organizational representatives. Without accurate understanding of social, cultural and institutional barriers, the efforts to introduce gender equality to science might remain a challenging target. Albeit it would seem that representatives of the physics field do accurately perceive the imbalance and, what is more, are able to correctly point towards some causes of this phenomenon, the responsibility usually seems to be placed elsewhere: cultural context, social norms, etc. Simultaneously, interviewees seem to adopt the attitude that their institutions are “immune” to these factors and are not reproducing gender stereotypes.

In the paper *Men and Women on the STEM track. Similar or diverse?* the authors also address individuals involved in STEM, as they attempt to analyze the gender differences usually presented as indicators of low female representation in STEM, such as low self-efficacy, goal conflict, or sense of belonging. The study addressed men and women studying in STEM majors and found that women (versus men), as predicted based on previous findings, feel less competent in STEM, value work in STEM less, and have a lower expectancy of succeeding in STEM. When it comes to career goals, women appreciated agentic goals (money, position, recognition, etc.) equally highly as men, but were, consistently with previous literature, more invested in attaining communal goals (working with and for others). The authors did not, however, find any gender differences in sense of belonging to STEM or in general behavioral intentions to engage in STEM, which was unexpected as previous literature points out the fact that women in general feel less connected to this field. The study constitutes preliminary evidence that there may be indeed fewer gender differences among those already engaged in STEM than we might have expected based on the previous research.

The authors of the third paper, entitled *Does time allocation matter in promotion decisions? – case study of women managers in Aptiv Krakow Tech Center* brings our attention to a business setting. The authors set out to look at the managerial career track from the perspective of time resources allocation. Time as a resource is scarce especially for those who need to devote it to both professional and household duties. It is well-documented that even though the women’s employment rate is going up, their family obligations are at the same level, which in the literature is referred to as ‘second shift’ (Hochschild 1989) or ‘dual burden’ (Anxo et al. 2007: 1). At the same time, managerial positions require a considerable amount of availability, mobility and long working hours. This situation creates a conflict of scarce time resources. The authors argue that this time dilemma might be a cause of women’s

underrepresentation in leadership positions, even in the most developed societies. The paper also presents a case study of women managers in Aptiv Krakow Tech Center. In this company decision makers were confounded by the gender gap at the higher managerial level, so they decided to engage in an investigation to look for causes and possible solutions. Several observations were made that led to broadening supervisors' knowledge of issues relevant to women's managerial progression in this specific company.

Continuing in the context of women's business career paths, the article *Gender differences in workaholism and work-related variables* focuses on gender differences in workaholism among working individuals. Researchers found that a gender difference is indeed present, and that workaholism is higher among women in the studied sample. Previous research on this matter resulted in mixed data – some showing greater workaholism among men, some showing otherwise and some even no difference. These findings provide the need for further investigation. The authors also discuss several strategies used by men and women when dealing with work overload. They found for example that women tend to score higher than men on the maladaptive (as opposed to adaptive) perfectionism scale. Maladaptive perfectionism was also found to be a mediator of the gender differences in workaholism.

In the paper entitled '*Gender' and 'startup' in scientific journals. A review of international research* qualitative meta-analysis of data collected in empirical research publications was conducted on the topic of the two theoretical categories of 'gender' and 'startups'. Among others, research questions of this paper concerned the following notions: what are the investigated problems in gender and startup research and what are the conclusions? The subject is of substantial importance taking into account the fact that, according to The State of Women-Owned Businesses Report (2018), female-founded firms constitute nearly 40% of all privately held companies in the United States and are equally profitable (Demartini 2018). The paper elaborates on the financial aspects of gender and startups discourse. Other subjects visible in the startup literature address potential bias in obtaining funding, intercultural differences, family support, and environmental factors (social and cultural context).

Gender equality in business and academia is slowly but gradually improving, not without a considerable amount of effort on the part of researchers, policy makers, non-profit organizations and individuals all around the world. Although, as we can see from various data, there is still a lot of room for improvement, the observed tendency is satisfactory. With this special issue we hope to bring about a better understanding of gender-related aspects of business and research activity of both men and women.

REFERENCES

- Anxo, Dominique, Lennart Flood, Letizia Mencarini, Ariane Pailhé, Anne Solaz and Maria Letizia Tanturri. 2007. *Time Allocation between Work and Family over the Life-Cycle: A Comparative Gender Analysis of Italy, France, Sweden and the United States*, IZA Discussion Papers, 3193: 1–35.
- Cheryan, Sapna, Victoria C. Plaut, Paul G. Davies and Claude M. Steele. 2009. *Ambient belonging: How stereotypical cues impact gender participation in computer science*, "Journal of Personality and Social Psychology", 97: 1045–1060.

- Dennehy, Tara C. and Nilanjana Dasgupta. 2017. *Female peer mentors early in college increase women's positive academic experiences and retention in engineering*, "Proceedings of the National Academy of Sciences", 114(23): 5964–5969.
- Diekman, Amanda B., Emily K. Clark, Amanda M. Johnston, Elizabeth R. Brown and Mia Steinberg. 2011. *Malleability in communal goals and beliefs influences attraction to STEM careers: Evidence for a goal congruity perspective*, "Journal of Personality and Social Psychology", 101(5): 902–918.
- Demartini, Paola. 2018. *Innovative Female-Led Startups. Do Women in Business Underperform?*, "Administrative Sciences", 8(4), 70.
- Dweck, Carol. S. 2007. *Is Math a Gift? Beliefs That Put Females at Risk*, in: Stephen J. Ceci and Wendy M. Williams (ed.), *Why aren't more women in science?: Top researchers debate the evidence* Washington, DC, US: American Psychological Association, pp. 47–55.
- European Commission. 2019. *She Figures 2018*. Luxembourg: Publications Office of the European Union, Luxembourg [4.11.2019].
- Hochschild, Arlie. 1989. *The second shift. Working parents and the revolution at home*, New York: Viking.
- Jaśko, Katarzyna, Joanna Pyrkosz-Pacyna, Gabriela Czarnek, Karolina Dukała and Marta Szastok, *Gender differences in career trajectory among recent STEM graduates in Poland* [under review].
- Młodożeniec, Marek and Anna Knapieńska. 2013. *Czy nauka wciąż ma męską pleć? Udział kobiet w nauce*, „Nauka”, 2: 47–72, http://www.pan.poznan.pl/nauki/N_213_04_Mlodozeniec.pdf [4.11.2019].
- National Science Board. 2019. *The Skilled Technical Workforce: Crafting America's Science & Engineering Enterprise*, <https://www.nsf.gov/nsb/publications/2019/nsb201923.pdf> [4.11.2019].
- Narodowe Centrum Nauki. 2019. *Informacja na temat udziału kobiet i mężczyzn w projektach badawczych finansowanych przez Narodowe Centrum Nauki w latach 2011–2018*, https://ncn.gov.pl/sites/default/files/pliki/informacja_na_temat_udzialu_kobiet_i_mezczyzn_w_projektach_NCN_2011-2018.pdf [4.11.2019].

