Gender Disparities in Academic Disciplines: An Attempt to Fill in the Blind Spots of Bibliometrics

Elena Chechik[1]

[1] *elenachechik@gmail.com*
Center for Institutional Analysis of Science & Education European University at St.Petersburg, 191187, Shpalernaya ul. 1, Saint Petersburg (Russia)

Introduction

This is a study of gender differences in research activity over time and in different disciplines as measured by scientific output in dissertations at two levels in the Russian system: PhD and the more advanced Doctor of Science (DS). Data are derived from more than 250,000 dissertations from 2005-2016, a data source with several advantages compared to WoS or Scopus for the purpose of this study: a) complete data, also for the SSH; b) easy gender disambiguation because Russian patronyms are gendered; c) easier attribution of the work (no need to attribute to the first author in multi-authored publications); d) the indication of career stage by separating between PhD and DS. The results show the expected gender imbalances in the spectrum between Engineering Science (male dominance) and Philology (female dominance). A trend over time towards increasing balance is seen only at the DS level, where the male share is higher than at PhD level in almost all disciplines. The results mainly confirm results from studies in other countries, however, the four advantages listed above make this study an important reference for further studies of gender disparities limited to WoS or Scopus.

One of the most widely explored gender gaps is the publication gap; its estimations are often based on WoS and Scopus data (Larivière et al., 2013; Huang et al., 2020). Russian academia shows gender gaps in publication productivity. Women publish less despite better representation in some fields (Paul-Hus et al., 2015; Pilkina & Lovakov, 2022).
Gender inequality research in science using WoS and Scopus bibliometric data has limitations due to SSH underrepresentation and a bias towards Natural Sciences, Engineering, and Biomedical Research, leading to a skewed view (Mongeon & Paul-Hus, 2016).
This study examines gender imbalances in Russian academia via two dissertation types, addressing questions such as: What imbalances exist? Which fields are affected? How do they vary by dissertation type and career stage? And what are the dynamics of imbalance?

Data

The data for this research are taken from the *Russian Book Chamber* website (the national bibliographic agency that carried out bibliographic and statistical records of publications issued in Russia). Information is available on the website about the field of research, the place of defense, the date of defense, and the type of thesis. We got 266,037 PhD and DS dissertations in 18 academic fields from 2005 to 2016. The most of dissertations in Russia are in three fields: Technical Sciences (16.5%), Economics (15.5%), and Medical Sciences (14.9%). The least number of dissertations is in Art Studies (0.8%), Culturology (0.9%), and Political Science (1.5%). We made female/male gender assignments for 258,826 dissertation authors (97.6%).

Results

Female and male authors

In Russian academia, there are two types of dissertations: PhD and Doctor of Science (DS). The DS is more prestigious and required for academic promotion, such as becoming a professor or holding a high administrative position. Most PhD authors in Russia are women (52.8% out of 227,730). However, in the 31,096 DSs authors, the share of male authors is higher (58.6%).

Share of female and male authors by research fields

Fig 1 shows male and female author shares across research fields. Female PhD authorship ranges from 27%-87% while female DS authorship ranges from 13%-77%.

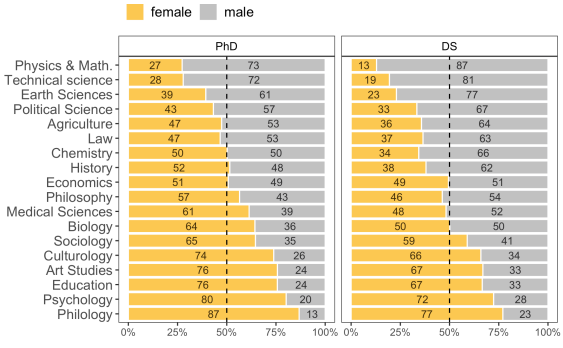

Figure 1. Share of female and male authors in 18 research fields.

Physics & Math has the highest male predominance while Philology has the highest female

predominance. Women are less represented in STEM fields, with the lowest proportion in Physics & Math. Men are underrepresented in Philology. Gender-balanced fields at the PhD level become more male-dominated at the DS level, except for Economics. The difference between female authorship in PhD and DS is present in all fields. This suggests women may advance less or leave academia more.

Ten-year dynamics by field and dissertation types

Fig 2 shows the dynamics of the share of women as PhD and DS dissertation authors from 2005-2016. The graphs are arranged from the primarily feminine fields (Philology, Psychology) to the primarily masculine (Technical Sciences, Physics & Math). For PhD dissertations, we see weak dynamics in most fields—the proportion of women almost always remains consistently high in women's fields and consistently low in men's fields. We do not see a trend toward the balance—the feminization of male fields and the masculinization of female fields.

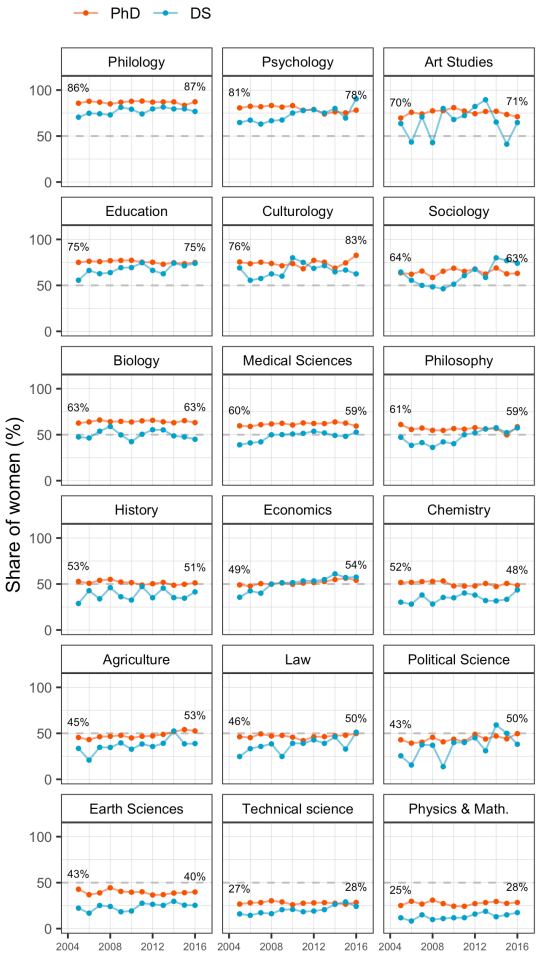

Figure 2. Share of female authors of PhDs and DSs in 2005-2016.

We see very different trends in the proportion of female DS authors. There is feminization in many fields, and examples can be found in both primarily female and primarily male fields. In Education, the share of female authors of DSs by the end of the period equaled the share of female authors of PhDs (75% female for both types of dissertations). Similarly, the gap in the share of female authors of PhDs and DSs disappeared for Psychology (both types of dissertations by the end of the period converged at about 78%), Philosophy (59%), Economics (54%), and even Engineering (28%).

Conclusions

Gender disparities in the Russian academic environment persist in PhD and DS dissertation defense rates, according to an analysis of women's presence from 2005-2016. Women are underrepresented in some academic fields, while others are more gender-equal. The analysis divides disciplines into three groups: primarily male, prone to equality, and primarily female. The proportion of female DS authors is lower than that of female PhD authors across all fields of study, but there is a feminization trend in many fields. However, the share of women among PhD authors does not show significant dynamics for 2005-2016. This study allows us to overcome limitations of bibliometric data in examining the gender structure of Russian science through dissertations. Future research will examine how defenses are distributed across organizations and subfields to reveal additional tendencies in gender imbalance in academia.

Additional information

Online Supplementary materials are available at https://github.com/hellche/issi2023.

Acknowledgments

This work was supported by RSCF – Russian Science Foundation, grant #21-78-10102.

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