SRF VACATION SCHOLARSHIP REPORT 2019

The form below should be completed by the student, then forwarded to the supervisor for approval and submission to srf@conferencecollective.co.uk within 8 weeks of completing the project. Please submit the form as a Word document.

A maximum of one figure (with legend of less than 100 words) may be appended if required.

Please note: excerpts from this form may be published on the SRF website, so please ensure content is suitable for website publication, and does not compromise future dissemination of data in peer-reviewed papers etc. The SRF reserves the right to edit responses to ensure suitability for publication on the website, newsletter or in promotional material.

Student's Name:	Marie Biolkova	**Student's Institution/University:**	The University of Edinburgh
Degree Title and year of study:	BSc Mathematics and Statistics, 3rd year		
Supervisor's Name:	Professor Norah Spears	**Supervisor's Department and Institution:**	Biomedical Sciences, The University of Edinburgh
Project Title:	Is the scientific peer review process free from gender bias?		

Briefly outline the background and aims of the project *(max 200 words)*

Publication of research in peer-reviewed journals is an important part of a scientific career as it affects whether someone gets hired, receives funding or is considered for promotion. It is therefore crucial that the decision to publish a manuscript is made based on the quality of the work alone. However, concerns have been raised about biases potentially affecting the outcome for a manuscript. The Reproduction journal uses single-blinded peer review (one in which the reviewers know the names of authors but the authors do not know the reviewers) and was interested in determining if the system is free of gender bias.

The aim of this project was to study the correlations between the likelihood of acceptance of a manuscript and the gender of any of the first author, last author or the Associate Editors and determine whether or not there is evidence of gender bias in the peer review of Reproduction. Due to data protection, the genders of authors and reviewers were not provided and had to be predicted using the first name and country of affiliation.

Did the project change from that proposed in the application? If so, what changes were made and why? *(max 100 words)*

The project did not change. An additional analysis of review manuscripts was included in addition to research papers.

What were the main results/findings of the project? *(max 300 words)*

Female scientists were more likely to appear as first author (57.8%), with the last author more often male (64.2%). While there was no significant effect of gender of first or last author on the final outcome, some differences were found at the editorial and reviewer level. The data showed that manuscripts were more likely to be accepted where female Associate Editors were dealing with female last authors (Chi-squared; n = 509, p = 0.042). The same non-significant trend was seen for male Associate Editors (Chi-squared; n = 1563, p = 0.503). Looking at males and females together, reviewers were more likely to give better recommendations to research papers with female last authors than to those with male last authors (Cochran-Armitage Test for Trend; n = 6443, p = 0.018): when male and female reviewers were

examined separately, this was significant only for female reviewers (Cochran-Armitage Test for Trend; n = 1874, p = 0.016). Female Associate Editors were more likely to appoint female reviewers than male Associate Editors (Chi-squared; n = 5107, p < 0.001). For review articles, it was difficult to draw firm conclusions, with only a small number of manuscripts available for analysis.

What do you conclude from your findings? *(max 150 words)*

Despite some significant differences in the process, the decision to publish a manuscript was not directly correlated with the gender of the first or last author or the Associate Editor, indicating that the current editorial procedures are fair as far as gender is concerned. Analyses of review manuscripts will be more informative once more data has been collected.

Further studies might want to focus on other factors that could potentially influence the decision to publish a manuscript, such as authors' country or the prestige of institutions they work at. One could also examine the changes in proportions of female/male first or last authors or reviewers over time to determine whether or not there is a trend towards parity and how long it will take until both genders are equally represented.

How has this experience influenced your thinking regarding your future/ongoing studies, and/or career choice? *(max 150 words)*

Having completed the project I feel much more confident about my Honours project in the upcoming (final) year of my degree. I improved my knowledge of the R programing language, data analysis and data visualization skills, practiced presenting the results to others (which I believe is one of the most important skills for a statistician) and learned how to search for relevant literature.

I am now even more convinced that I want to pursue a Masters degree in Statistics and/or Data Science. The project exposed me to an academic research environment and having observed the enthusiasm and passion of everyone involved, I am now considering applying for a PhD in the future (possibly after a few years of experience in the industry).

Please use the space below to add any other comments/thoughts about the SRF Vacation Scholarship *(max 100 words)*

Student: Although my type of project was a bit different than others funded by SRF, I was provided with excellent conditions and I am very grateful for this opportunity. The project helped me become more confident when working with unprocessed data and allowed me to broaden my scientific horizons – not just in the field of statistics and data analysis, I also learned a lot about scientific publishing and biomedical research in general.

Supervisor: Marie got on extremely well during her vacation scholarship, working very independently, and getting a good handle on a subject that she knew little about before the start (the process of publishing scientific manuscripts). Since the project was novel for both of us, it has also been very interesting seeing the results at the end. Marie plans to submit an abstract to present her findings at Fertility 2020, and I'm sure that they would be of interest to people there.