



Universiteit
Leiden
The Netherlands

Identification, dynamics and performance of mixed gender teams

Weijden, I. van der; Yegros Yegros, A.; Borges Des Santos, F.; Lamers, W.

Citation

Weijden, I. van der, Yegros Yegros, A., Borges Des Santos, F., & Lamers, W. (2018). Identification, dynamics and performance of mixed gender teams. *Sti 2018 Conference Proceedings*, 1068-1071. Retrieved from <https://hdl.handle.net/1887/65328>

Version: Not Applicable (or Unknown)

License: [Leiden University Non-exclusive license](#)

Downloaded from: <https://hdl.handle.net/1887/65328>

Note: To cite this publication please use the final published version (if applicable).



STI 2018 Leiden

*23rd International Conference on Science and Technology Indicators
"Science, Technology and Innovation Indicators in Transition"*

STI 2018 Conference Proceedings

Proceedings of the 23rd International Conference on Science and Technology Indicators

All papers published in this conference proceedings have been peer reviewed through a peer review process administered by the proceedings Editors. Reviews were conducted by expert referees to the professional and scientific standards expected of a conference proceedings.

Chair of the Conference

Paul Wouters

Scientific Editors

Rodrigo Costas
Thomas Franssen
Alfredo Yegros-Yegros

Layout

Andrea Reyes Elizondo
Suze van der Luijt-Jansen

The articles of this collection can be accessed at <https://hdl.handle.net/1887/64521>

ISBN: 978-90-9031204-0

© of the text: the authors

© 2018 Centre for Science and Technology Studies (CWTS), Leiden University, The Netherlands



This ARTICLE is licensed under a Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International License

Identification, dynamics and performance of mixed gender teams¹

Inge van der Weijden*, Alfredo Yegros Yegros*, Felipe Borges des Santos* and Wout Lamers*

*i.c.m.van.der.weijden@cwts.leidenuniv.nl; a.yegros@cwts.leidenuniv.nl;

f.borges.des.santos@cwts.leidenuniv.nl; w.s.lamers@cwts.leidenuniv.nl;

CWTS, Leiden University, Kolffpad 1, Leiden, 2333 BN (The Netherlands)

Introduction

The growing emphasis on teams and groups in knowledge production, combined with women's educational gains in science and engineering, propel gender diversity to the forefront of promising new opportunities for scientific discovery (Nielsen et al., 2017). Recent studies suggest positive links between gender diversity of teams and collective problem solving (Woolley et al, 2010) as well as effectively using the expertise of each team member (Joshi, 2014). Little is known about the dynamics of group composition within academia. We therefore formulated three research questions:

- (1) Which percentage of the teams are composed of both male and female scholars?;
- (2) What are differences between countries and world regions regarding mixed teams?;
- (3) What are developments over time?

Methods

Gender assignment

All the scientific publications in the period 2009-2016 corresponding to articles and reviews were extracted from the CWTS-licensed edition of the Web of Science (WoS). Author gender indicators have been calculated on the assignment of gender to the authors of the WoS publications by using Genderize.io (<https://genderize.io/>). Genderize.io has 216,286 distinct names across 79 countries and 89 languages gathered from social networks. We took the names of the authors as registered in the field AF of the WoS database. Using the address database at CWTS, each potential clean-name, affiliation-location combination was identified and passed to Genderize.io API. The Genderize.io API returns for each clean name – country combination a gender, count and probability. We assigned gender to the author first name-country combination if this combination had a gender assigned with at least a count of 10 and a probability of 0.9. We defined mixed gender teams as those publications listing to at least one author of each gender. In all other cases, where all authors are of the same gender, we call them homogeneous teams.

Bibliometric data production

We measured the share of output of mixed gender teams versus homogeneous teams. The scientific outputs have been analysed at the level of individual countries for the EU28 member states and for several world regions. These are : EU 28; ERA (EU28, EFTA

¹ This work was supported by EU funded project Identification of Key Technology Domains, PP-02941-2015 under the framework contract: 2010/S172-262618.

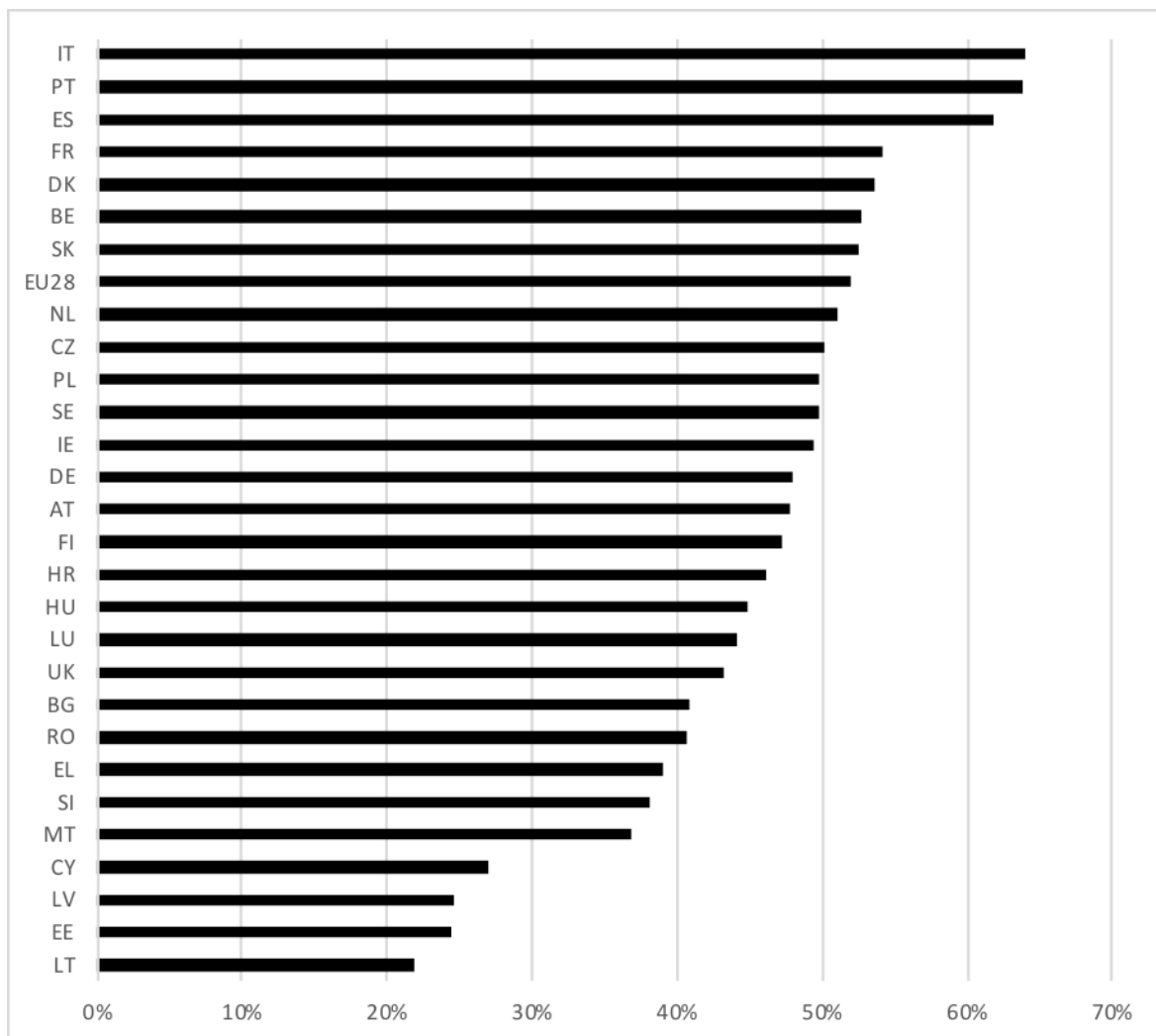
countries, Bosnia and Herzegovina, Moldova & Israel); North America (United States & Canada); Advanced Asia (Japan & South Korea) and BRICS (Brazil, Russia, India, China & South Africa).

Findings

In 32.8% of teams the gender could be assigned to all individual team members (WoS publications 2009-2016). In general 47,3% of these identified teams are teams with both male and female members, the so called mixed gender teams. 41,4% of the identified teams consist of only male members, and 11,2% of only female members.

Figure 1 shows the share of output of mixed gender teams for the EU28 countries. In general, 52,04% of the output have been produced by mixed gender teams. The top three EU countries are: Italy (IT=64,02%), Portugal (PT=63,88%) and Spain (ES=61,76%). Interestingly, the countries listed in the top three of share of women lead authors, Latvia (LV), Lithuania (LT) and Romania (RO) (van der Weijden, Borges des Santos & Yegros Yegros, 2018) are now ranked at the bottom of the list.

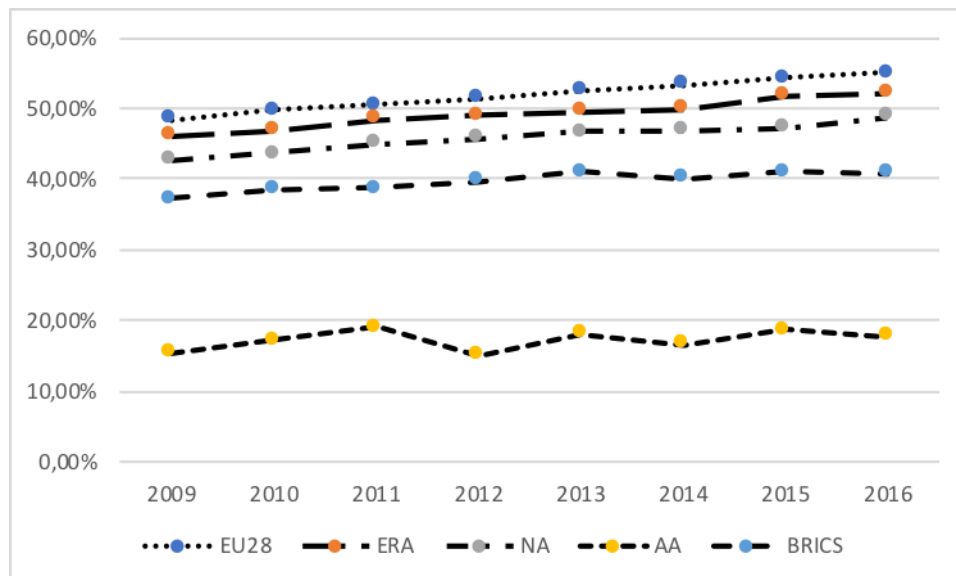
Figure 1. Share of output of mixed gender teams per country (EU28)



The evolution of the share of output of mixed gender teams is shown in Figure 2. All the world regions have been gradually increasing over time the share of output of mixed gender

teams. The EU28 countries take the lead, with 48.44% in 2009 and 54.96% in 2016. The growth in BRICS and Advanced Asia is smaller compared to the other world regions.

Figure 2. Evolution of share of output of mixed gender teams (2009-2016)



Conclusion & Discussion

In conclusion, all world regions have been gradually increasing over time the share of output of mixed gender teams. EU28 countries outperform in each reported year, from 2009 till 2016, the other world regions. In future studies, which are scheduled in the spring and summer of 2018, we will analyse possible performance differences between the three typologies of teams, homogeneous male teams, homogeneous female teams and heterogeneous (mixed) teams within EU28 countries. We will also study the impact of scientific field in this respect. A recent study in China (Ying Ma, 2017) showed that homogenous male teams are more conducive to better performance than mixed team. However this result was not found in Chinese homogenous female teams. Shall we find the same kind of outcomes in the EU? In our future study we will concentrate on citation impact with indicators such as the percentage of highly cited publications in top 10% and top 1% most cited publications.

References and Citations

Joshi A. (2014). By whom and when is women's expertise recognized? The interactive effects of gender and education in science and engineering teams. *Adm Sci Q*, 25(2), 202–239.

Ma, Y. (2017). The effect of gender composition of research teams on individual researchers' performance in China. *STI Policy Review*, 8(2), 1-22

Nielsen, M.W., Alegria, S., Börjeson L., Etkowitz, H., Falk-Krzesinski, H.J., Joshi, A., Leahey, E., Smith-Doerr, L., Woolley, A.W., Schiebinger, L. Opinion: Gender diversity leads to better science. *Proc Natl Acad Sci*. 114(8): 1740–1742.

Van der Weijden, Borges des Santos, Yegros Yegros (2018). Gender equality. Deliverable D5-1.1: Interim Report E. Centre for Science and Technology Studies (CWTS). Leiden University, The Netherlands. February 2018.

Woolley A.W., Chabris C.F., Pentland A., Hashmi N., Malone T.W. (2010). Evidence for a collective intelligence factor in the performance of human groups. *Science*, 30(6004), 686–688.