

Examining gender biases in the recruitment of assistant (W1-) professors in disciplinary comparison – results from an experimental study at German universities.

Sophie Hofmeister (WZB), Alessandra Rusconi (WZB), Heike Solga (WZB)

Introduction & Research Questions

Women still underrepresented among professorships – especially in STEM fields

- Two major processes explain women's underrepresentation: *leaky pipeline* (Berryman 1983) and *glass ceiling* (Bryant 1984)

- Focus here on: glass ceiling
→ gender biases in transition to assistant (W1-) professorships

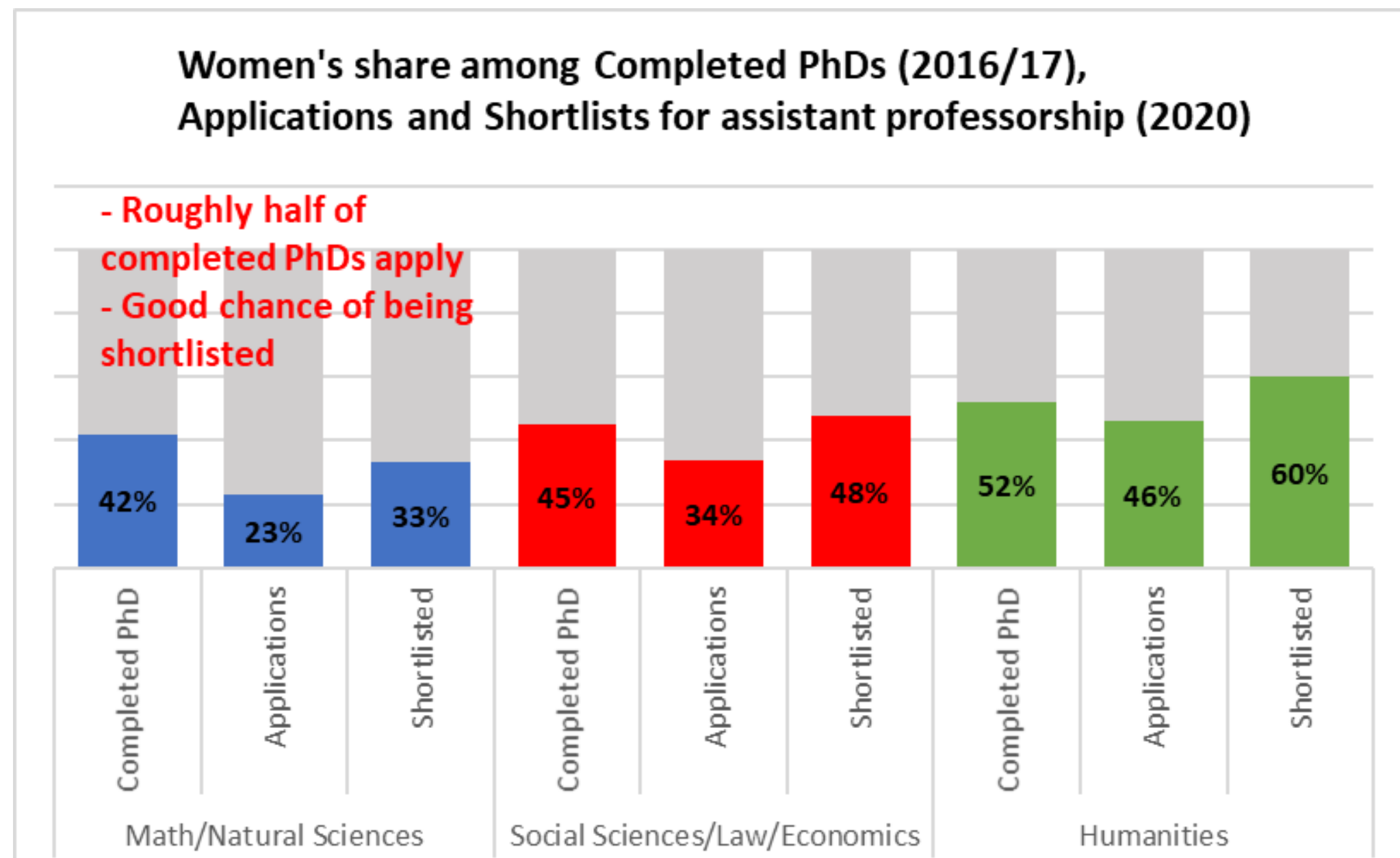
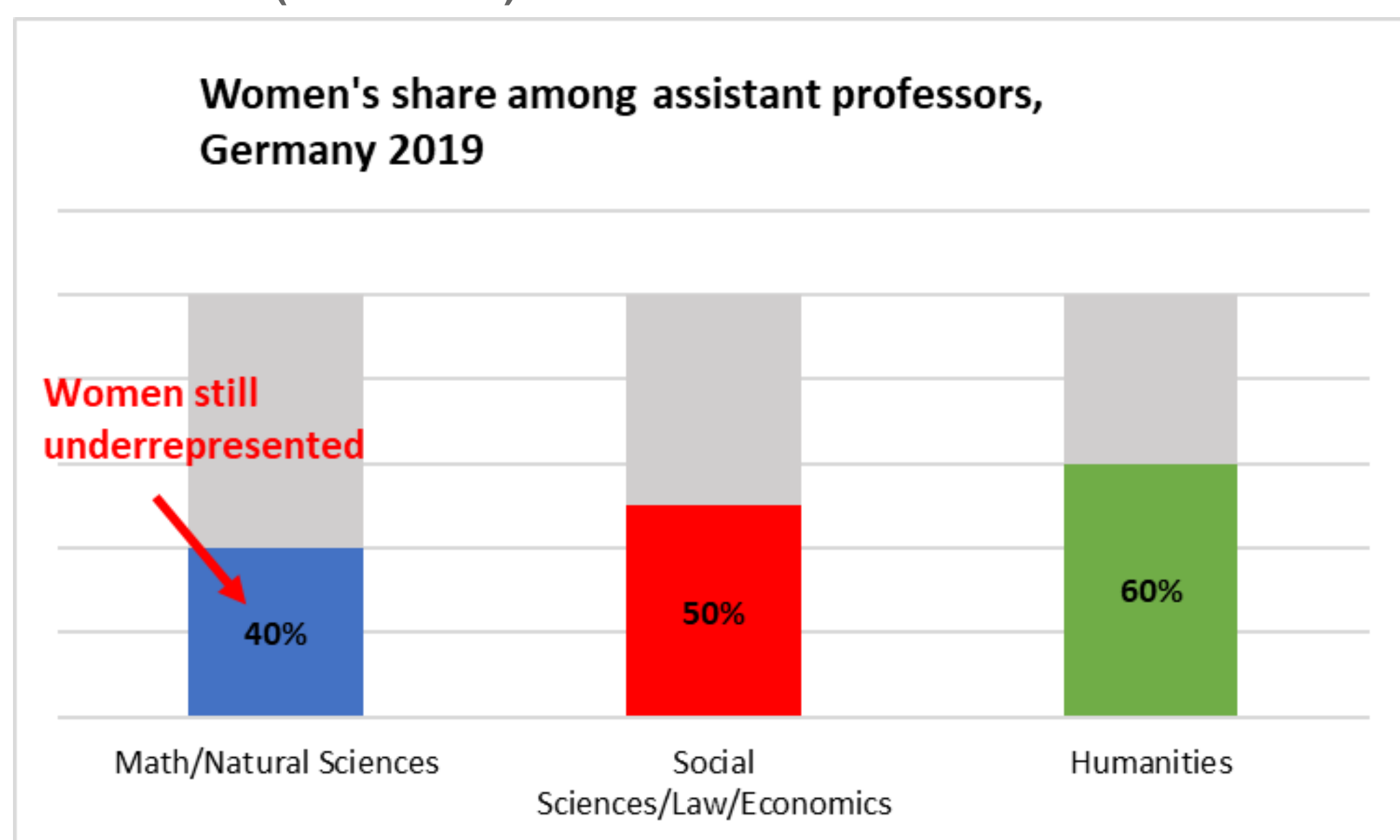
Research Questions

- RQ 1: Differences in **assessment of male/female applicants** in terms of being invited and being perceived as qualified?

- RQ 2: **Variation between disciplinary groups Math/Physics, Social Sciences (incl. Economics) and German Studies?**

Background & Research Gap

- Affirmative action needed**
- Implementation of several gender equality policies in Germany over last decades
→ one central measure: **gender-based preferential selection**
- Statistics (GWK 2021) show:**



- Unclear from statistics:**
- Good chances of being shortlisted because of **women's better real/perceived performance** or because of **actual preferential selection**

- Research** on gender biases in W1-hiring is **rare with mixed results** (e.g. Gerxhani, Kulic, Liechti 2021; Ooms, Werker, Hopp 2018; Williams, Ceci 2015)

Twofold research goal:

- Examining whether gender biases** contribute to women's underrepresentation in Math/Natural Sciences among ass. professors in disciplinary comparison

(along Expectation States Theory (Ridgeway, Bourg 2004), Stereotype Content Model (Fiske, Cuddy, Glick 2002), Lack of Fit Model (Heilmann 2012))

→ We expect ...

- H1a: ...a female disadvantage in being perceived as competent and being invited for a job interview for an ass. professorship position, which is largest in Math/Physics (disadvantage in absolute terms).

- H1b: ...that female applicants are disadvantaged in being perceived as competent and being invited in Math/Physics because here male/female ratings do not differ, while female applicants are rated higher than male applicants in other disciplinary groups (disadvantage in relative terms).

- Examining actual use of female preferential selection in Math/Natural Sciences** as because it is here, where it's use is still necessary

(along Signaling Theory (Henningsen, Horvath, Jonas 2021; Spence 1973))

→ We expect ...

- H2a: ...a female advantage in being perceived as qualified and being invited in Math/Physics but no female advantage in other disciplinary groups.

- H2b: ...that the female advantage in being invited in Math/Physics cannot be fully explained by an advantage in being perceived as competent.

- H2c: ...that the female advantage in being invited in Math/Physics becomes explicitly evident for the women who are perceived as highly competent.

Data and Method

Experimental data from factorial survey (vignette study)

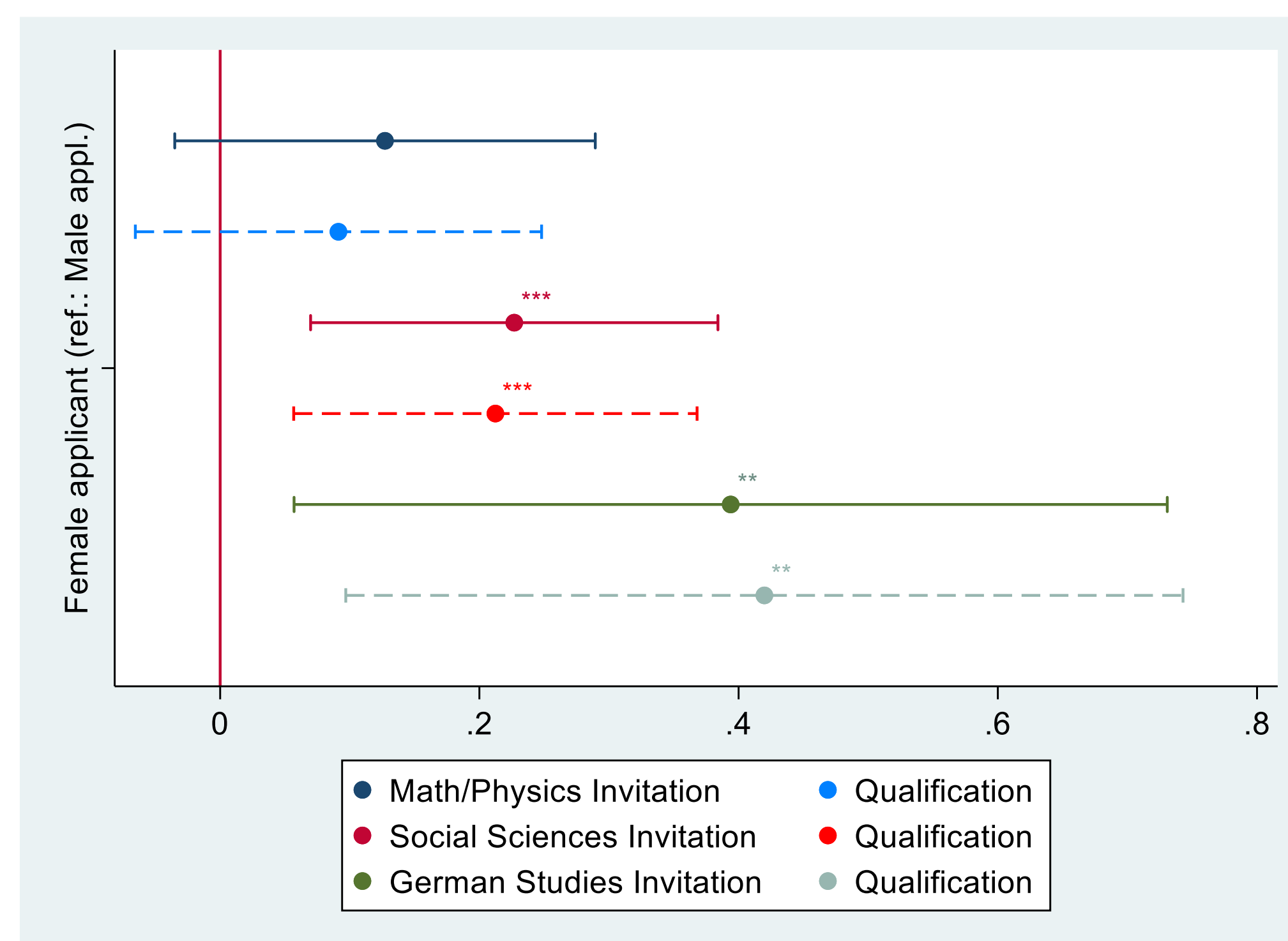
- Respondents: German professors in Math/Physics (n=700), Social Sciences (n=908), German Studies (n=249)
- Rating of short fictitious profiles (/vignettes) of applicants for assistant (W1-) position in terms of a.) competence and b.) likelihood of inviting the applicant to a job interview (/being shortlisted)
- Between-subject design for applicant's gender

Dependent Variables	Scale
- Qualified	1-7
- Invite	1-7
Vignette Dimensions	
- Gender Applicant	Female Male
- Type of position	Tenure-track Non-tenure track
- Publication Type	Majority solo-authored (peer-reviewed) Majority co-authored (peer-reviewed) All co-authored (peer-reviewed)
- Research Collaborations	With renowned scholars With scholars of same level
- Third-Party Funding	No (note does not appear) Successful acquisition
- Parental Leave	No (note does not appear) 6 months parental leave
Fixed Characteristics & Control Variables	
Fixed characteristics: completed German PhD with <i>magna cum laude</i> (very good), 4 years work experience as Postdoc, Teaching experience	
Control Variables: Gender respondent, Academic age respondent, Other controls necessary for vignette analyses (e.g. position vignette within deck)	

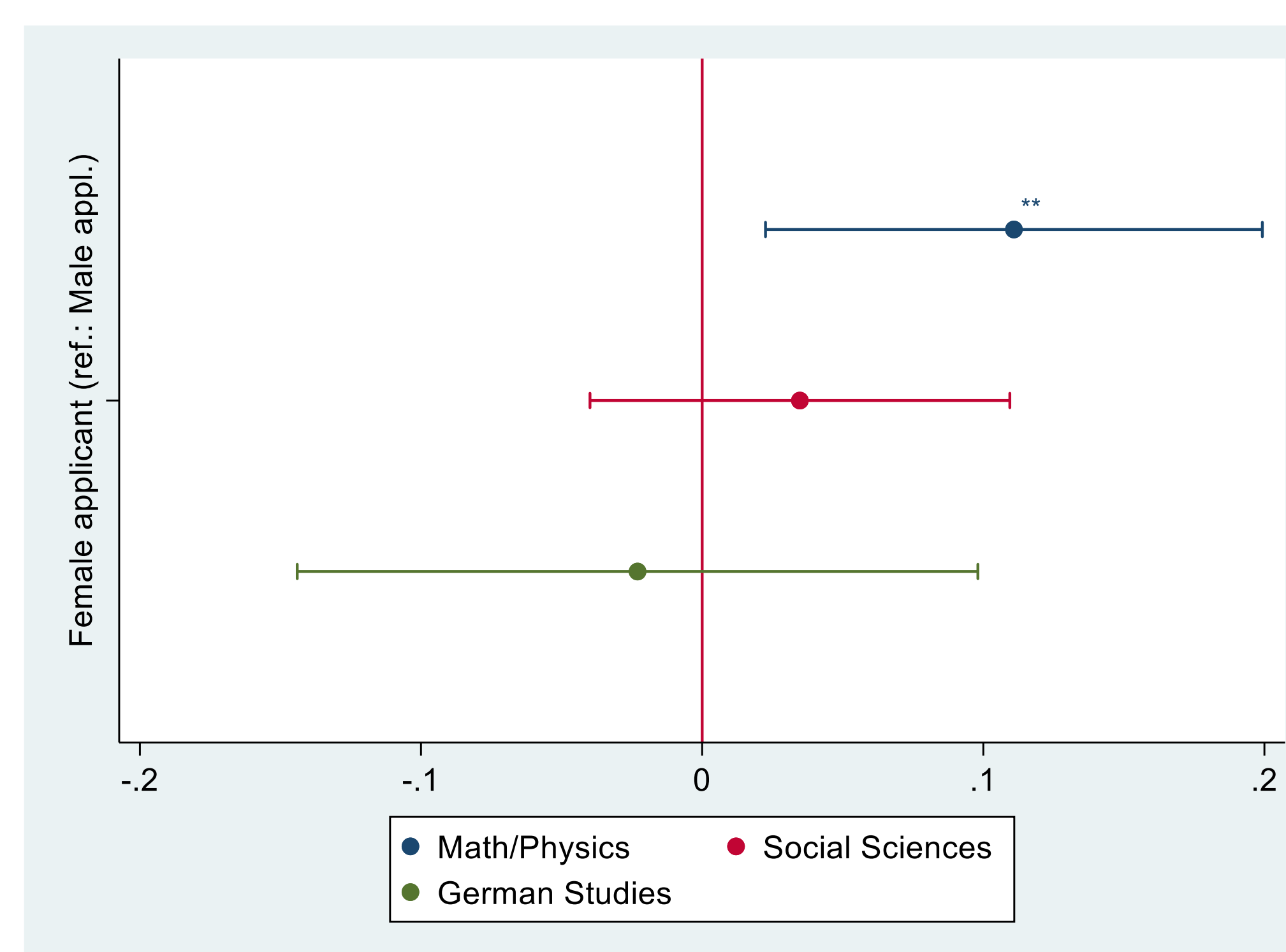
Method: Multi-level linear models with random intercepts and Average Marginal Effects (AME)

Results

- Applicant's gender differences in likelihood of being invited and in being perceived as qualified (dashed line) (models include all dimension)**



- Applicant's gender differences in likelihood of being invited when perceived as equally qualified (models include all dimensions)**



- No female disadvantage in Math/Physics (in absolute or relative terms)**

- Rejection of H1a, H1b

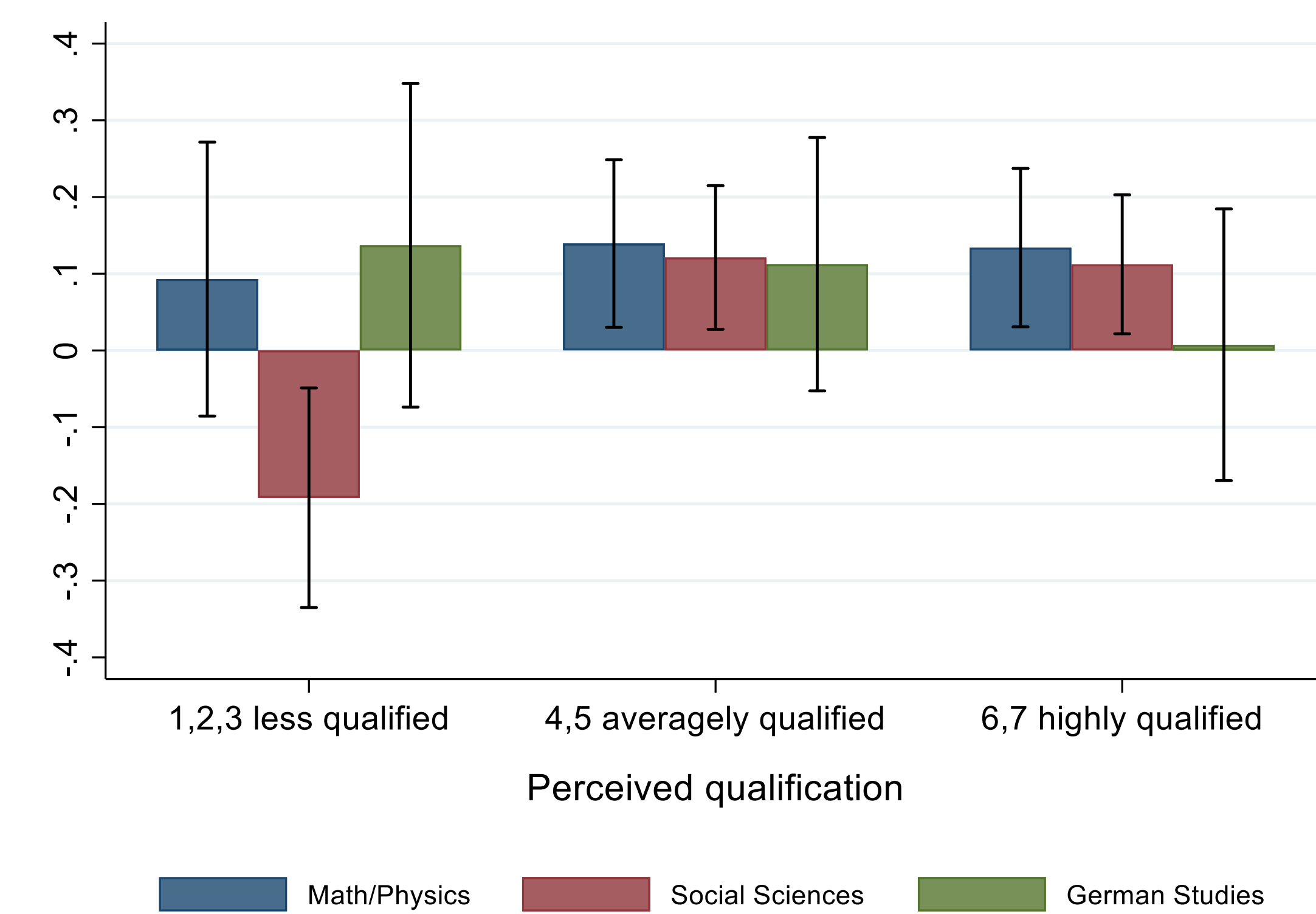
- Female advantage in being perceived as competent and being invited in Math/Physics but also in Social Sciences and German Studies**

- Rejection of H2a

- Female advantage in being invited in Math/Physics goes beyond and above advantage in being perceived as competent; actual preferential selection**

- Acceptance of H2b

- Applicant's gender differences in the likelihood of being invited by perceived qualification (AME) (models include all dimensions)**



- **Female advantage in being invited in Math/Physics evident for women perceived as averagely and highly qualified**

- Acceptance of H2c

- **Female advantage in being invited in Social Sciences, that turned out to be an actual advantage in being perceived as competent evident for women perceived as averagely and highly qualified**

- **Female disadvantage in being invited in Social Sciences for women perceived as less qualified**

Conclusion

→ Results show:

- No gender biases but female advantage in being invited in Math/Physics, Social Sciences, German Studies**

- Social Sciences and German Studies:**
Female advantage in being invited is an **actual advantage in being perceived as qualified**

- Math/Physics:**
Female advantage in being invited goes beyond and above advantage in being perceived as qualified
→ **actual preferential selection of women**

→ Results suggest:

- Affirmative action policy internalized by faculty of all disciplinary groups, leading to actual preferential selection only in Math/Physics
- Cause for women's W1-underrepresentation in Math/Physics seems to be women who apply less often, not gender biases in hiring

→ Further research:

What is it that makes women apply less often than men?

References

- Berryman, S. E. (1983). *Who Will Do Science? Trends, and Their Causes in Minority and Female Representation among Holders of Advanced Degrees in Science and Mathematics. A Special Report*. New York.
- Bryant, G. (1984). *The Working Woman Report*. New York (New York): Simon and Schuster.
- Fiske Susan, T., Cuddy Amy, J. C. and Glick Peter, X. J. (2002). A model of (often mixed) stereotype content: Competence and warmth respectively follow from perceived status and competition. *Journal of personality and social psychology*, **82**, 878–902.
- Gerxhani, K., Kulic, N. and Liechti, F. (2021). *Double standard? Co-authorship and gender bias in early stage academic hiring*. Lausanne: University of Lausanne.
- GWK (2021). *Chancengleichheit in Wissenschaft und Forschung*, 25. Fortschreibung des Datenmaterials (2019/2020) zu Frauen in Hochschulen und außer-hochschulischen Forschungseinrichtungen. Bonn.
- Heilmann, M. E. (2012). Gender stereotypes and workplace bias. *Research in organizational behavior*, **32**, 113–135.
- Henningsen, L., Horvath, L. K. and Jonas, K. (2021). Affirmative Action Policies in Academic Job Advertisements: Do They Facilitate or Hinder Gender Discrimination in Hiring Processes for Professorships? *Sex roles*, **86**, 34–48.
- Ooms, W., Werker, C. and Hopp, C. (2018). Moving up the Ladder: Heterogeneity Influencing Academic Careers Through Research Orientation, Gender, and Mentors. *Studies in Higher Education*, **44**, 1268–1289.
- Ridgeway, C. L. and Bourg, C. (2004). Gender as status: An expectation states theory approach. In Eagly, A. H., Beall, A. and Sternberg, R. (Eds.), *The Psychology of Gender*. New York: The Guilford Press, pp. 217–241.
- Spence, M. (1973). Job marketing signaling. *The Quarterly Journal of Economics*, **87**, 355–374.
- Williams, W. M. and Ceci, S. J. (2015). National Hiring Experiments Reveal 2: 1 Faculty Preference for Women on STEM Tenure Track. *Proceedings of the National Academy of Sciences*, **112**, 5360–5365.