

Gender differences in competitiveness

To what extent can different attitudes toward competition for men and women explain the gender gap in labor markets?

Keywords: gender, competitiveness, labor markets, education

ELEVATOR PITCH

Differences in labor market outcomes for women and men are highly persistent. Apart from discrimination, one frequently mentioned explanation could be differences in the attitude toward competition for both genders. Abundant empirical evidence indicates that multiple influences shape attitudes toward competition during different periods of the life cycle. Gender differences in competitiveness will not only influence outcomes during working age, but also during early childhood education. In order to reduce the gender gap in educational and labor market outcomes, it is crucial to understand when and why gender gaps in competitiveness arise and to study their consequences.

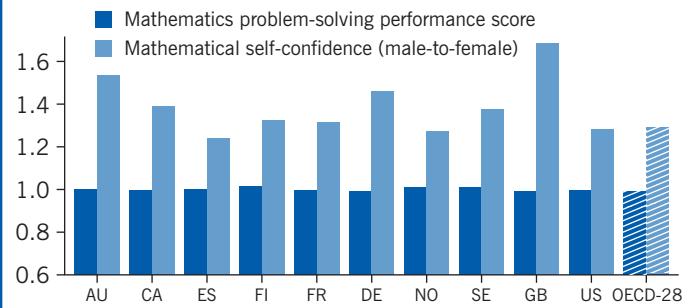
KEY FINDINGS

Pros	Cons
<ul style="list-style-type: none"> + Gender differences in the willingness to compete are one source for the gap in labor market outcomes. + Empirical evidence indicates that attitudes toward competition are formed early and turn out to be remarkably persistent. + In some instances (e.g. valuation of job characteristics), women might consciously choose to be less competitive, which does not reward direct intervention, per se. + Empirical results show that the gender gap in competitiveness is rather fluid in nature and can be affected when using the right tool. 	<ul style="list-style-type: none"> - The empirical literature finds a significant gender gap in competitiveness in many different settings under multiple circumstances; the main sources and driving forces are still under debate. - Empirical evidence from the field is still scarce, as clear decisions to compete are hard to identify. - Closing the gender gap in competitiveness might not be desirable under all circumstances, as men are often found to be overconfident and overcompetitive. - Gender gaps in competition have been found to play a prominent role in (subject) choices for students.

AUTHOR'S MAIN MESSAGE

In addition to the well-documented gender pay gap, women are globally under-represented in top-level jobs. One obvious explanation for this is discrimination. Differences in attitudes toward competition, which are observed in the empirical literature, offer another explanation. These differences could partly explain the gender gaps in labor market outcomes. A future challenge is to mitigate the negative consequences of these gaps on the way to achieving gender equality in labor markets. Reforms of the educational systems could help to encourage competitive attitudes and affect educational choices of women. One possibility is to consider gender-segregated education in specific subjects. Some evidence suggests that any intervention is most likely to be successful during early ages. In contrast, preferences regarding competitiveness are found to evolve over time.

Gender gaps in educational performance and self-confidence



Note: Ratio of males to females: 1 = gender neutrality; values above 1 indicate male pupils either perform better or are more confident regarding their own performance.

Source: Author's calculation using 2012 PISA data. Online at: <https://www.oecd.org/pisa/keyfindings/pisa-2012-results.htm>

MOTIVATION

Depending on the type of data analyzed, the unexplained gender wage gap ranges from 5% to 15% in modern industrialized countries. The obvious reason for this gap could be discrimination against women, in the classical sense. Conflicts between work and family life could also play an important role. One alternative explanation, which has lately received a lot of attention, identifies another key element: the different preferences regarding attitudes toward competition for men and women.

In addition to the observed wage differences, the under-representation of women in high-wage positions is also a common finding for nearly all industrialized countries. Recently, affirmative action policies as well as explicit gender quotas have been vividly discussed, and partly introduced, to help increase the share of women in well-paid, senior jobs.

The illustration on p. 1 shows the PISA survey scores for students aged 15–16 in mathematics tests and differences in self-confidence regarding mathematical ability for selected OECD countries in 2012. While there is little descriptive evidence for a gap in performance, the gender gap with respect to confidence is significantly large, in favor of male pupils.

DISCUSSION OF PROS AND CONS

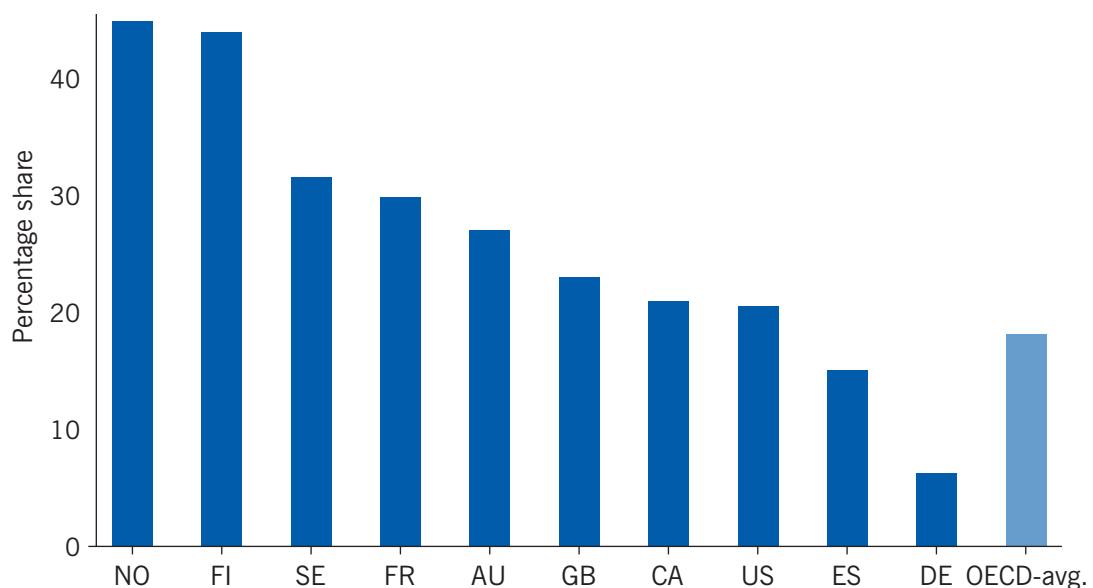
Empirical evidence on gender differences in competitiveness

Attitudes toward competition play a crucial role in many different circumstances. While competitiveness can be directly analyzed by measuring the willingness to enter competitive situations, as well as subsequent performance under competitive pressure, attitudes toward risk taking are closely related because competing often involves taking risks. However, although obviously related, this article focuses primarily on the gender gap in competitiveness directly, ignoring most aspects of differences in risk-taking behavior for men and women.

Competitiveness, defined as the willingness to engage in competitions, is an important determinant for the decision to enter competitions that offer a certain prize, for instance, a job or a higher position in the hierarchy of a company. For example, investment fund managers regularly have to make investment choices that involve competitive decisions, and are usually evaluated in comparison to the performance of competing funds. Financial compensation in these specific labor markets is quite often determined according to relative performance. Promotion into managerial positions usually involves highly competitive selection processes, demanding a certain level of competitiveness from all applicants. In order to beat co-applicants in a classic promotion tournament, an individual has to perform better than the other contestants. The same is true for political elections, competitions for positions in academia, affiliations in education programs, or competitions for research funds in the private or public sector.

Indeed, average representation of female board members in high-profile companies in the OECD is just above 20% (Figure 1). Northern European countries provide a positive example with rates well above 40%, but large countries like the US, Canada, and Spain are below 30%. A particularly low value is measured for Germany, which stood below 10% in 2013. One relatively recent example of a policy directly aimed at increasing female representation in top-level jobs is seen in Norway. In 2003 a law was passed which mandated a quota for women on public limited liability companies. In this case, the policy intervention, which is directly aimed at increasing female representation on companies' boards, required

Figure 1. Representation of women on the boards of Forbes 500 companies in 2013, for selected OECD countries



Source: Based on OECD. *Share of Women on Boards of Directors in Forbes Global 500 Companies*. Paris: OECD, 2013. Online at: <http://www.oecd.org/gender/data/boardroommembershipbysex.htm>

companies, from January 2006, to have at least 40% female board members. As shown in Figure 1, Norway's mandatory quota was actually exceeded in 2013 for Forbes 500 companies.

The empirical literature shows, for many different settings, that women have a tendency to shy away from competitive situations. This manifests itself in a significant and sizable gender gap with respect to the metric, "willingness to compete." The majority of empirical evidence on this topic comes from laboratory or field experiments. The obvious advantage of experimental studies is the clear structure and full control over the settings and the treatments analyzed. Laboratory experiments, carried out primarily in the US and Europe, most often find clear evidence for a considerable gender gap in competitiveness. Only a very small amount of evidence suggesting lower willingness to compete for women comes from field data. Field data are hard to track and clear measures of competitiveness are hard to identify. Empirical evidence on revealed preferences is also confirmed by several studies analyzing stated preferences, drawing on large-sample survey data.

The explanation for the evident gender gap in competitiveness, however, is still disputed. One strand of the literature focuses on a large range of biological factors to explain why women tend to compete less than men. While some of these factors, like differences in hormone cycles, are transitory, it is also argued that the general genetic differences between men and women can explain the observed gap. Results from a more recent study, however, point out that increased stress levels cannot explain the gender gap in competitiveness.

In contrast to the nature-related explanation described above, it is argued that the social environment or personal history of individuals can be an important factor in the

formation of attitudes toward competition for men and women. Many scholars argue that nurture, in the form of the general social environment, educational background, culture, or family characteristics, plays an important role, starting in early childhood.

A key factor with respect to nurture is the different forms of socialization that occur in a more patriarchal or matrilineal society. Drawing on an earlier experimental setup, convincing evidence for the social environment as a major influence affecting gender competitiveness comes from an experimental study [1]: in a large-scale global experiment the authors ask children to select themselves into different competitive settings while performing a ball throwing task. They find that there are no gender differences in a matrilineal society (e.g. Khasi, in India) at any age during adolescence. In contrast to this, they find a gender gap in competitiveness in children that have grown up in a patriarchal society (e.g. Masai, in Tanzania). This gap, however, is only evident for children aged 13 or older. This result is a clear indicator that the general way in which a society is formed as well as the time exposed to a particular societal structure both play important roles in forming a gender gap with respect to willingness to compete.

Among the many potential nurture-related factors that can influence and shape attitudes toward competitiveness, one focus is on the gender composition of competitions. Women are often observed to exhibit higher levels of competitiveness when competing only among women than when competing in mixed-gender groups. While this is certainly relevant in a wide range of different settings, it is especially important for various aspects of the educational system.

The nurture components of the gender gap with respect to competitiveness are most likely formed early on in life, and appear to be rather persistent. In a very broad experimental study on young individuals, a team of researchers shows that kindergarten aged boys are already more willing to compete than their female classmates [2]. This study provides robust evidence that suggests attitudes toward competition are not only formed early in childhood, but are also relevant in later stages of life. After re-examining this gap two years later, the authors find that the earlier measured gender gap remains stable over time.

Also, psychological factors play a significant role. Evidence suggests that priming subjects with a high-power situation can close the gender gap in competition [3]. This suggests that gender differences in competitiveness do react to relatively short-lived and low-cost interventions. A similar type of intervention is “role models.” Empirical evidence suggests that observing role models increases women’s competitiveness, while leaving the competitiveness of men unchanged [4]. Also, timing plays a central role: alternative findings focused on a longer time horizon suggest that women’s willingness to compete evolves over their lifecycles, as the gap in competitiveness between younger and older women is comparable to the gap between women and men [5].

While competitiveness is mostly measured as the willingness to compete or the decision to enter competitive environments, it also represents an important aspect that can be used to compare the productivity of men and women when they actually have entered a competitive setting. Evidence on this matter is presented by a study drawing on data from a laboratory experiment: while the researchers find a sizable gender gap regarding self-selection into competitive settings, there is no difference in productivity [6]. In contrast to this, some studies suggest that women actually perform less well when they have to compete against men. These performance reductions are not observed when women compete among each other.

Implications for the labor market

Women are still under-represented in top-level jobs on a global scale. Vertical as well as horizontal occupational segregation is found to be a key component in the overall unadjusted gender wage gap. Many studies examining a variety of countries in recent years show that there is still a well-described, yet unexplained, gender gap in wages. One common explanation for this gap is discrimination, in the classical sense: employers could simply exhibit a taste for discrimination and actively discriminate against women, even though this is illegal in most industrialized states. Discrimination in this way is not only illegal, but would also have a cost-increasing effect; employers operating in this manner would be drawing from a shrinking talent pool with increased respective wages.

However, the under-representation of women in certain types of jobs could also be explained by differences between the preferences of women and men regarding competition. Top-level jobs with high salaries usually require a certain level of job-related competitiveness. For example, managerial positions are often rewarded to the winners of a promotion tournament, which demands competitiveness from all potential applicants.

However, the entirety of the observed gender wage gap does not necessarily have to originate from the preferences and self-sorting of individuals into certain types of jobs. Women might, on average, also get lower wages for the same type of jobs as men because they are less aggressive when it comes to initiating salary (increase) negotiations. Negotiating salaries at job interviews involves a certain level of competitiveness and self-confidence, while overly high demands can potentially cost an applicant the opportunity to get a job. Additionally, any on-the-job negotiations for a pay raise also demand a certain level of competitiveness. If women are less competitive during these critical salary or promotional phases, then this will ultimately translate into them receiving lower salaries than their male colleagues for the same types of jobs.

As far as application behavior is concerned, data from a large-scale field experiment presents interesting empirical evidence: nearly 2,500 job seekers were randomly assigned to jobs with different contract details, allowing the authors to analyze the negotiating and sorting behavior of male and female applicants [7]. The authors conclude that women are indeed less willing to negotiate for jobs where wage negotiability is initially ambiguous. As a result, the gender wage gap within a job type increases for jobs that have unclear or negotiable wage schedules.

Regarding specific competitive or self-confident behavior and strategies during wage negotiations or job interviews, there are few empirical results to lean on. Because such types of negotiations are usually confidential, data on individual wage-bargaining behavior for men and women are generally not available. One of the few studies that use data from the field analyzes employer-employee data from Portugal to estimate the differences in bargaining power for men and women. The authors argue that their results can potentially explain 10–15% of the overall gender gap in wages.

Beyond the concepts of self-selection into jobs and hesitant wage bargaining, possible performance reductions in competitive situations should also be considered. If it is true that women not only shy away from competition, but also exhibit declines in productivity when put under competitive pressures, this might further explain why they earn less or are not hired into high-wage jobs as often as men, who do not appear to suffer from the same competitive diminutions. Indeed, there is some empirical evidence that suggests,

in a mixed-sex setting with a competitive incentive scheme, a gender gap in performance actually does exist. This is due to the fact that the performance of male participants increases, while women perform equally as well in noncompetitive settings [6]. While the widening gender gap in performance is the key result here, the fact that women do not perform worse, but rather equally well could be a result of the specific experimental setup. In general, there is convincing empirical evidence for different environments that increased pressure and competition does cause a gender gap in performance. Going back to the Illustration on p. 1, however, there is no pronounced gender gap in PISA mathematical test performance, while there is a significant gap in self-confidence. Male pupils are much more confident of their test scores than female pupils.

How gender gaps in competition affect education

Apart from the clear implications for labor market outcomes, the successfulness of educational systems is also influenced by the willingness-to-compete gender gap. As presented in the Illustration on p. 1, the gender gap in competitiveness is also observed in educational systems. While the performance of men and women in mathematical scores is almost identical, there is a clear gap in confidence. This gap is very large in the UK, with Australia and Germany ranking second and third. Spain exhibits a surprisingly low discrepancy between mathematical ability and confidence in the PISA 2012 study, outperforming even Scandinavian countries. The US is measured right at the OECD-28 average.

An important incentive for school pupils is their relative success compared to their peers. As such, any form of education within groups (i.e. classes) involves a certain degree of competition. As mentioned before, male and female willingness to compete appears to be influenced by the gender composition of the competitors. This finding has profound implications on how educational systems should be organized. If women are more willing to compete among their same-sex peers, girls can actually benefit from being schooled in girls-only classes, at least in certain subjects.

Indeed, there is evidence showing that female pupils, for example, have lower scores in mathematics tests, compared to boys, when they are in mixed classes. This performance gap shrinks significantly when schooling is conducted in single-sex classes. There is convincing evidence coming from the empirical literature that mathematics scores play an important role for later earnings in the labor market. Following the empirical literature, the level of competitiveness acquired in school will also carry over to later stages of a person's working life.

Recent evidence suggests that the choice of mathematics-intensive fields of specialization in high school can be predicted by experimentally revealed preferences to compete. Controlling for preferences of students can reduce the gap in subject choices by 9–17% [8]. Evaluation of individual preferences regarding competition, however, still turns out to be elusive and task-dependent. Analyzing an educational setting, recent findings suggest an insignificant gender gap in the willingness to select a competitive option in an experiment if the experimental task is relatively difficult. This is due to the fact that male participants tend to reduce competitiveness, while women's decisions remain unchanged compared to facing relatively easy tasks [9].

In the tertiary education sector, the gender gap in college graduation rates in some countries (e.g. the US) has actually reversed over time. Overall, more female students are attending college and acquiring degrees than male students. Still, this development has not transitioned to the (top-level) labor markets. Lower levels in willingness to compete by women can also explain this gap between educational attainment and (top-level) labor market success, as competition for jobs requires a substantial degree of competitiveness. This specific form of competitiveness required by the labor market is probably not yet necessary in tertiary education. A seminal study presents results from a laboratory experiment among secondary school pupils in Amsterdam, the Netherlands, in which empirical evidence indicates a direct relation between competitiveness (as measured in secondary school) and later career choices [10]. Other recent results suggest a direct link of college seniors' willingness to compete and later labor market outcomes: there is a positive association between female students' willingness to compete and later compensation. This relationship is not found for male students [11].

Do men compete too much?

It is frequently discussed whether male individuals compete “too much,” in the sense that they are too willing to engage in overly competitive behavior at the cost of outcome or performance. This is often termed “overconfidence,” and can be observed in a variety of settings. Consequently, simply increasing women’s overall level of competitiveness to that of men, on the whole, might actually be counterproductive.

An important study on potential male overconfidence uses data from private stock market traders and presents evidence that both women and men tend to be overconfident regarding their trading behavior [12]. Men appear willing to trade more frequently than women, which can be interpreted as a higher level of competitiveness and confidence. However, more frequent trading actually decreases the men’s portfolio returns, and the authors attribute this to overconfidence. Surprisingly, both genders are found to be overconfident; however, the level of overconfidence is larger for men. This result has been confirmed primarily by laboratory experiments. Additional empirical evidence on this gap in overconfidence shows that it is influenced by marital status, age, and labor market experience.

A more recent study of data for female and male executives of US companies finds that male executives are more overconfident than their female counterparts [13]. In this classic example of a highly competitive environment, the results show that male executives undertake more acquisitions and issue more debt than female executives. The higher number of acquisitions by male executives yield lower announced returns than those made by their female counterparts.

Further evidence can be found indicating the potential negative effects of male overconfidence, as markets tend to exhibit price bubbles in male-dominated trader markets [14]. Prize expectations in all-male markets turn out to be higher than the fundamental value of assets, while all-female markets exhibit prizes below the fundamental value. Based on this, the authors of the study conclude that financial markets operate differently, indicating that bubbles could be less likely and smaller as the share of female traders increases. Moreover, they cautiously link this to the housing market bubble in 2008, citing possible overconfidence and excessive competitiveness by men in the trading industry.

LIMITATIONS AND GAPS

Most empirical evidence on gender differences in competitive attitudes comes from laboratory or field experiments. Evidence from field data is hard to come by, as key information is often unavailable and data usually do not allow direct identification of decisions that can be interpreted as competitive behavior. Ideally, researchers should have detailed information about competitive actions and their consequences for men and women during their respective working and social lives. These data are, however, unavailable for the majority of relevant settings.

One potentially underemployed source of data from the field is professional and amateur sports data. Sports provide a clear framework of rules and incentives, and a wide array of different competitive settings can be observed. Moreover, decisions to enter competitions are often directly observable, and can be linked to their immediate consequences. Sports also exhibit a wide variety of single and group competitions with single- and mixed-gender environments. As the literature on mixed- and single-gender environments is still somewhat inconclusive, sports situations provide valuable opportunities to potentially confirm an increase in competitive behavior by females if they are asked to compete in single-sex groups or teams.

Another important focal point for future research should be the type of task that participants in such laboratory experiments are asked to undertake. Usual tasks from experimental studies are running tasks, maze solving, or solving mathematical problems. Data from the field could also help to understand how the environment and task types drive the empirical results. This has strong implications for possible educational reforms, as subjects that exhibit a gender gap should be the focal point of any such reform.

A crucial factor is the general social environment or context of a country. A series of experiments carried out among pupils in certain countries find that boys perform better in a running task when competing against each other. In contrast, findings presented by another study suggest that there is no significant difference in competitive behavior between girls and boys in Sweden for different types of tasks [15]. These contradictory results could ultimately be attributed to the fact that the experiment was conducted in a rather gender-neutral environment: Sweden. This is one example of how the social environment may affect the competitiveness of its inhabitants.

Consequently, it is of high importance to understand which forces at which stage of an individual's development help shape gender differences, so that policy measures may be introduced to close the gender gap. Compared to obvious affirmative action policies, such as quotas similar to Norway's executive quotas, any policy directly aimed at making women, in a broad perspective, more competitive, could be much more efficient. Once all the major factors for the formation of competitive attitudes are identified, these factors should be the focus of policy intervention in order to achieve this goal and subsequently further close the gender gap in general.

SUMMARY AND POLICY ADVICE

The empirical literature regarding gender differences in competitiveness is rich and growing. Differences between the genders are found to be present in many different settings and environments, and are exhibited at different stages of the life span. The varying attitudes

of women versus men toward competitiveness are seen as one viable explanation for multiple observed gender gaps, in particular when it comes to labor market outcomes. This gap in competitive attitudes, in combination with performance differences between the genders in competitive situations, can explain the well-documented under-representation of women in top-level and executive jobs. Women may not select themselves into these jobs, as they tend to exhibit a lower willingness to compete, especially when competing against men.

Gender gaps in wages could also be partly related to a gender gap in competitiveness. Negotiating wages on the job or applying for a job with flexible wage schemes will demand a certain level of competitiveness, which will influence salaries later on in a person's career, irrespective of actual productivity. Indeed, there is evidence that women are somewhat reluctant and less aggressive when it comes to initiating negotiations or applying for jobs with negotiable salaries.

Additionally, salaries for top-level jobs (e.g. fund managers) are often defined in relation to the performance of peers, which will benefit those who embrace the competition and perform well under competitive pressure.

A large number of empirical studies present convincing evidence that gender differences in competitiveness are formed early on in childhood and are relatively persistent, exerting a profound influence on an individual's future career. As such, obvious policy measures, such as quotas for certain job positions and job types, might not be the most efficient way to enact affirmative action policies to close the gender gap. Any fundamental policy measure designed to address this specific gender gap should be targeted directly at early childhood education, as well as the primary and secondary education systems in general.

Educational systems the world over rely primarily on a non-gender-segregated way of teaching; however, there is sufficient evidence in the empirical literature to suggest that segregating genders, at least in some selected subjects like mathematics, might benefit female pupils, thereby helping to close the competitiveness gender gap.

Acknowledgments

The author thanks two anonymous referees and the IZA World of Labor editors for many helpful suggestions on earlier drafts and René Böheim for helpful comments and support. Version 2 of the article suggests early interventions to close gender competitiveness gaps are more likely to be successful, finds new evidence on how such gaps play a role in subject choices for students, and adds new "Key references" [3], [4], [5], [8], [9], [11].

Competing interests

The IZA World of Labor project is committed to the IZA Code of Conduct. The author declares to have observed the principles outlined in the code.

© Mario Lackner

REFERENCES

Further reading

- Bertrand, M. "New perspectives on gender." In: Ashenfelter, O., and D. Card (eds). *Handbook of Labor Economics Volume 4B*. Amsterdam: North-Holland, 2011.
- Azmat, G., and B. Petrongolo. "Gender and the labor market: What have we learned from field and lab experiments?" *Labour Economics* 30 (2014): 32–40.

Key references

- [1] Andersen, S., S. Ertac, U. Gneezy, J. A. List, and S. Maximiano. "Gender, competitiveness, and socialization at a young age: Evidence from a matrilineal and a patriarchal society." *Review of Economics and Statistics* 95:4 (2013): 1438–1443.
- [2] Sutter, M., and D. Glätsle-Rützler. "Gender differences in the willingness to compete emerge early in life and persist." *Management Science* 61:10 (2015): 2339–2354.
- [3] Balaoutas, L., H. Fornwagner, and M. Sutter. "Closing the gender gap in competitiveness through priming." *Nature Communications* 9:1 (2018): 1–6.
- [4] Schier, U. K. "Female and male role models and competitiveness." *Journal of Economic Behavior & Organization* 173 (2020): 55–67.
- [5] Flory, J. A., U. Gneezy, K. L. Leonard, and J. A. List. "Gender, age, and competition: A disappearing gap?" *Journal of Economic Behavior & Organization* 150 (2018): 256–276.
- [6] Niederle, M., and L. Vesterlund. "Do women shy away from competition? Do men compete too much?" *The Quarterly Journal of Economics* 122:3 (2007): 1067–1101.
- [7] Leibbrandt, A., and J. A. List. "Do women avoid salary negotiations? Evidence from a large-scale natural field experiment." *Management Science* 61:9 (2015): 2016–2024.
- [8] Buser, T., N. Peter, and S. C. Wolter. "Gender, competitiveness, and study choices in high school: Evidence from Switzerland." *American Economic Review* 107:5 (2017): 125–30.
- [9] Hoyer, B., T. van Huizen, L. Keijzer, S. Rezaei, S. Rosenkranz, and B. Westbroek. "Gender, competitiveness, and task difficulty: Evidence from the field." *Labour Economics* 64 (2020): 101815.
- [10] Buser, T., M. Niederle, and H. Oosterbeek. "Gender, competitiveness, and career choices." *The Quarterly Journal of Economics* 129:3 (2014): 1409–1447.
- [11] Kamas, L., and A. Preston. "Competing with confidence: The ticket to labor market success for college-educated women." *Journal of Economic Behavior & Organization* 155 (2018): 231–252.
- [12] Barber, B. M., and T. Odean. "Boys will be boys: Gender, overconfidence, and common stock investment." *Quarterly Journal of Economics* 161:1 (2001): 261–292.
- [13] Huang, J., and D. J. Kisgen. "Gender and corporate finance: Are male executives overconfident relative to female executives?" *Journal of Financial Economics* 108:3 (2013): 822–839.
- [14] Eckel, C. C., and S. C. Füllbrunn. "Thar SHE Blows? Gender, competition, and bubbles in experimental asset markets." *American Economic Review* 105:2 (2015): 906–920.
- [15] Dreber, A., E. von Essen, and E. Ranehill. "Outrunning the gender gap—Boys and girls compete equally." *Experimental Economics* 14:4 (2011): 567–582.

Online extras

The **full reference list** for this article is available from:

<https://wol.iza.org/articles/gender-differences-in-competitiveness>

View the **evidence map** for this article:

<https://wol.iza.org/articles/gender-differences-in-competitiveness/map>