Ready, Steady, Compete

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The educational attainments of women exceed those of men in most developed countries, yet women continue to lag behind in access to top corporate jobs (1, 2). Women are also underrepresented in politics (3). Without dismissing the role of discrimination, recent research has implicated a lower preference of women for competition. On page xxx of this issue, Balafoutas and Sutter (4) show how affirmative action policies can increase the willingness of women to compete without affecting the chances of highly skilled men to succeed and while preserving postcompetition cooperation between individuals.

Labor economists have traditionally explained the occupational gender gap by the role of women in the family or by demand-side factors such as discrimination by employers. More recently, behavioral economists have explored other hypotheses. In particular, the lower preferences of women for risks (5, 6) could explain why women are less likely to start up their own business than men. Women differ from men in their attitudes toward negotiation and in social preferences, which could lead them to choose occupations offering fewer career opportunities than those chosen by men (7).

One dimension has retained the attention of behavioral economists: Compared with men, women tend to have different attitudes toward competition. The performance of men in a gender-neutral task tends to increase as the environment becomes more competitive, whereas that of women tends to remain stable (8). The same difference is observed in running races: Boys tend to outperform girls when racing against someone else, but not when running alone (9). These results have initiated studies on how individuals self-select when they can choose between receiving a payment based on relative versus absolute performance. Women are much less likely than men to choose a competitive compensation scheme, even after accounting for risk preferences, relative ability, and beliefs about relative performance (10).

This gap in competitiveness seems to be embedded in culture. Women are more likely than men to compete in matrarchal societies, whereas the opposite is observed in patriarchal tribes (11). The gender gap emerges from the age of five; below this age, boys and girls show no difference in competitiveness (12). Girls from single-sex schools tend to be more willing to compete than girls from coeducational schools (13). This does not mean, however, that biological factors are absent. In an experiment involving math and word problems, women in the low-hormone phase of the menstrual cycle were less likely to enter tournaments than those in a higher-hormone phase, although their average performance was not affected by hormonal fluctuations (14).

Holding the lower competitiveness of women responsible for their lower performance in the labor market should influence the design of policies aiming at breaking the glass ceiling. Policy interventions that increase the monetary incentives associated with competitive pay schemes relative to individual pay or that allow individuals to choose the gender of their potential competitors both entice more women to compete. This shows that women are not rejecting competition systematically. However, these interventions also increase men's competitiveness and, therefore, fail to narrow the gender gap in competitiveness (15).

Affirmative action can be more effective, as shown for example by Niederle, Segal, and Vesterlund (16), who introduced a gender quota that guaranteed women equal representation among the winners of an ability-based tournament involving a math task. Without affirmative action, a competitor won the tournament if his/her performance exceeded that of at least four of the five other group members. With affirmative action, the two winners were the best performing woman and the highest performer of the remaining five participants. In the latter case the entry rate of high-performing women into the competition rose, whereas that of men fell.

The authors attribute this change to two main elements: Quotas distort the objective probability of women to win the competition, but they also improve the confidence of women in their ability to succeed while reducing men's overconfidence. If affirmative action only changed the objective probability of women to win tournaments, this might have created reverse discrimination, as high-ability men could be passed by less able women. The authors find little evidence of such reverse discrimination, because the quotas attracted more able women in the competition. It remains to be shown whether this result holds for other policy interventions.

Balafoutas and Sutter compare three different affirmative action policies: quotas forcing a gender balance among winners, two forms of preferential treatment that artificially increase the performance of women, and a repetition of the competition unless a sufficient number of women compete. In their experiment, participants had to choose between an individual piece-rate scheme and a tournament pay scheme before performing a calculation task, first in the absence of policy intervention and then after one of the various policy interventions had been introduced. Comparison of these competition-entry choices reveals that men compete twice as often as women in the absence of policy intervention but that all the policy interventions reduce the gender gap in competitiveness (or even reverse it). In addition, the interventions do not affect men's choices significantly, whereas they motivate high-ability women to enter the competition.
As in (16) but for a wider range of policies, Balafoutas and Sutter find that, with very few exceptions, the most able men are not overtaken by less able women. Thus, the policies reduce the competitiveness gap without causing reverse discrimination or reducing efficiency.

Affirmative action may thus ensure fairness if its main effect is to motivate talented but shy women to enter more frequently into competitive schemes. Still, men who think that affirmative action creates unfair competition may be less willing to cooperate with women after competing under affirmative action. In the last part of Balafoutas and Sutter’s experiment, participants play a two-player coordination game with each other group member. The authors find that policy interventions do not harm post-competition cooperation, a hitherto unexplored aspect of affirmative action programs.

These studies (4, 16) explore supply-side effects of affirmative action, whereas labor economists have tended to focus on its demand-side effects (17). A more complete picture would require looking at both effects in combination to measure how a higher competitiveness of women will change the demand for labor and affect discrimination. Modification of compensation packages should also be explored further as a route to increasing the proportion of women in top-level occupational positions.

References

Surviving in a Toxic World

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The world can be a dangerous place. Although the nematode Caenorhabditis elegans is probably best known as a model organism thriving in the demanding environment of research laboratories, in nature it lives in the soil, exposed to many toxic compounds that are often produced by the microorganisms on which it feeds. One group of these compounds, the avermectins, are produced by the soil bacterium, Streptomyces avermitilis (1). On page XXXX of this issue, Ghosh et al. (2) report that a natural variation in a C. elegans gene, gcl-1, confers resistance to the avermectins and also to S. avermitilis. Because avermectin resistance is a serious problem in veterinary medicine (3), and avermectin (a semisynthetic avermectin) is used to control human parasitic diseases such as river blindness (4), this result has wider implications for effective parasite control and human health.

Avermectin blocks their electrical activity and causes paralysis. In nematodes, the most important avermectin receptors are the glutamate-gated chloride channels (GlucIs), which in C. elegans are encoded by six genes, including gcl-1 (5). In laboratory strains of C. elegans, high-level avermectin resistance is polygenic, requiring mutations in several genes (6). However, despite considerable effort, the genetic basis for resistance in parasitic nematodes is not well understood.

Ghosh et al. looked for avermectin resistance in wild C. elegans populations. They found a Hawaiian isolate, CB4856, which is resistant to both abamectin (a synthetic avermectin derivative) and avermectin, at concentrations that almost completely paralyzed the normal laboratory strain, N2. Simple genetics suggested that the resistance trait was recessive, and the subsequent quantitative trait locus analysis examining the drug sensitivity of 210 inbred lines generated from crosses between N2 and CB4856 narrowed the likely resistance gene down to gcl-1. The sequence of gcl-1 had 77 nucleotide differences between the two strains, plus a small deletion in CB4856. Introducing the N2 version of gcl-1 into CB4856 made the resistant worms drug-sensitive. When several of the differences in gcl-1 between the two strains were studied in isolation, only the four–amino acid deletion failed to rescue the phenotype, showing that this small deletion in gcl-1 is by itself...