

Gender and Competition: Women like Power as Men Do

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Summary

This paper, using an experimental laboratory technique, investigates the issue of the gender gap in competition. It focusses on the competition for power, defined as it was the power to influence the utility in a group of subjects by determining the amount of their monetary reward. In the laboratory, it has been created an artificial situation in which experimental subjects (undergraduate students of the University of Siena) were given the chance to compete for power. They had to decide whether to make a bid to win an auction which would enable them to distribute a sum of money among a group of four experimental subjects different from themselves. Two main results emerged. First of all, power, as I defined it, can be seen as an economic good, in other words, most of the agents are willing to pay a positive sum of experimental money in order to buy the benefit to control other agents' rewards. Secondly, there is no gender difference in this experiment: women enter into the competition as frequently as men and there are no significant differences in bidding behavior between men and women.

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1 Introduction

When looking at the top positions in policy, business, journalism and other human activities, it is quite indisputable that for the vast majority these positions are occupied by men. While this is a shred of unquestionable evidence, it is quite less clear what the causes of this phenomenon are.

The first family of possible explanations deals with explicit discrimination. There is no doubt that women have been openly discriminated in the past both in Europe and in the New World: they could not perform a lot of activities and mainly they could not occupy positions of power especially those which implied having authority over men. And in some countries, it is still the case nowadays. Although the idea of perfect equality between men and women is widely diffused in the modern and developed societies, the practical application of this principle goes much more slowly and there are still a lot of forms of underhand and hidden discrimination against women. Even because most of the cited positions are often chosen by co-optation by an assembly in which men are the majority.

The second possible explanation is based on implicit discrimination. There are a lot of social factors which impede or discourage females' career. The importance of these aspects is witnessed by the evidence that in those countries where social instruments (ad example, nurseries and other facilities for mothers) able to ameliorate the trade-off between maternity and career are widely available the number of women in the leading positions is higher.

Finally, a completely different explanation is based on preferences. The cited evidence could be just the result of a different attitude towards competition of women compared to men. Both psychological studies and findings in the experimental economics literature seem to provide sensible support to the idea that men and women have different preferences and reactions towards competition (Campbel, 2002).

It goes without saying that these three explanations are not mutually exclusive. It is possible and actually quite probable that all are working and they also can dynamically reinforce each other. More important, the presence of different attitudes towards competition should not weaken the necessary fight against all forms of sexual discrimination in every field of human activity and should not reduce the demand for policies aiming to improve the presence of women in the leading positions.

The main contribution of the present paper is to provide experimental evidence of how men and women behave when a very particular form of competition, the competition for power, is considered. I defined power in a very strict sense as "possession of control, authority, or influence over others" (Merriam-Webster, Dictionary online, www.merriam-webster.com/dictionary/power); in our framework and in economic terms, it was the power to influence the utility in a group of subjects by determining the amount of their monetary reward.

All top positions cited before entail monetary advantage, higher wages and other materialistic benefits, and non-monetary advantage, the intrinsic satisfaction of being the one with the power of deciding over the others. In real life, the two sides of power go along and it is almost impossible to differentiate between intrinsic and extrinsic motivation for power. The advantage of the experimental method is to provide a framework in which it is possible to isolate the two motivations. In the experiment, in fact, in order to plainly discriminate between intrinsic (the desire to acquire power) and the extrinsic (the amount of money gained throughout the experimental sessions) motivation, power did not encompass any personal monetary advantage.

I present the results of a very simple experiment in which an agent can buy the power to distribute a sum of experimental money among the members of a group which the agents do not belong to.

Two main results emerged. First of all, power, as I defined it, can be seen as an economic good, in other words, most of the agents are willing to pay a positive sum of experimental money in order to buy the benefit to control other agents rewards. Secondly, there is no gender difference in this experiment: women enter into the competition as frequently as men and there are no significant differences in bidding behavior between men and women.

The first result shows that there is an intrinsic motivation for searching power and that people are willing to pay for it; the second result is partially in odd with other experimental results on the same issue and provides another interesting piece in the puzzle of the relationship between gender and competition

2 Gender and competition

There is a rapidly growing literature on gender differences in competition based both on experimental and field experiments (Niederle & Vesterlund, 2011). Some findings suggest that women are less willing than men to engage in competitive activities. Niederle & Vesterlund, (2007), for example, find that having to choose their own compensation scheme between piece-rate compensation or a winner-take-all tournament for an activity where there were no differences in performance (addition problem), 73% of the men chose the tournament while 65% of the women chose the piece-rate compensation. Successively a series of papers presents similar results (Niederle, 2017). Three main reasons have been proposed in order to explain why women shy away from competition: differences in beliefs (men tend to be more overconfident than women), differences in risk attitude (men tend to be less risk averse), differences in other-regarding behaviour (women tend to have more social preferences than men)¹. While gender differences in confidence seem to play a significant role in explaining the result, there is little evidence that the other two factors play an important role. Moreover, simultaneously controlling for these factors generally leaves a significant gender gap in tournament entry. This suggests that differences in attitudes toward competition also help explain why men and women differ in their willingness to compete (Niederle and Vesterlund, 2011).

A different strand of the literature shows that men and women react differently when finding themselves in a competitive environment and that women tend to perform less well in a competition. Gneezy et alia, 2003, for example, showed that male increased their performance when the compensation scheme passed from a piece rate to a competitive one, while women performance remained statistically the same. Furthermore, this different behavior cannot be explained by gender differences in risk aversion. Interestingly enough, the gender gap in performance is larger in a mixed-sex competitive environment than in non-competitive payment schemes or single-sex competitive environment. In other words, women do not perform greatly when competing against men. Field experiments (Paserman, 2007, Buser, Niederle, & Oosterbeek, 2014,) seem to confirm that the performance gap between men and women exists and it increases with competitive pressure.

More recently some papers have stressed the role of age in explaining the competition gender gap. Instead of considering young students, (Boschini, Dreber, Von Essen, Muren, & Ranehill, 2018) Boschini, et al, 2018, explored whether these gender gaps also occur in a simple random sample of the Swedish adult population. When looking at the willingness to compete in two domains, a math task, and a verbal task, they found no gender differences in willingness to compete in the verbal task in this random sample. There is some evidence for men being more competitive than women in the math task, but the size is however noticeably smaller than what has been found when considering young students. Flory, Gneezy, Leonard, & List, (2018) directly analyzed the role of age. Their paper shows evidence that women's preferences over competition change remarkably with age: therefore, the gender gap, though large for young adults, tends to disappear in older populations since older women are much more competitive. While these studies confirm that the existence and strength of gender gaps depend on the social framing and on the particular studied population, they also suggest that there are a lot of open questions to analyze on this topic.

¹ For a complete overview of the gender differences in preferences, see Croson & Gneezy (2009)

This paper offers a diverse although complementary view: the idea is to verify whether preferences for power are different between women and men. In our simple framework women and men have the chance to offer a sum of money in order to acquire the power to decide how to distribute rewards among a group of agents. To my knowledge, there are no other studies on the willingness to compete for power. The extreme simplicity of the experiment enables to elicit the pure preference for power without any role for beliefs and risk aversion. The result is clear: there isn't any gender difference according to the desire to obtain power.

3 Experimental designs

The experiment took place at the University of Siena. The participants were 64 undergraduate students (32 males and 32 females) recruited through advertisements asking for participants in a paid experiment. The experiment was conducted with double-blind anonymity ensured: the choice of the subjects could not be observed either by the experimenter or by the other experimental subjects and it begins with the subjects filling a questionnaire. The experiment was conducted in four different sessions of 16 students each (8 males and 8 females).

Soon after the questionnaire, agents played a dictator game (200 tokens, that with a conversion rate equal to 0.015 corresponds to 3 Euros) in which the role of the receiver is played by a charity organization freely chosen by subjects themselves. This game is played just once in the session. Subjects were informed that the sum given to the chosen charity would be multiplied by 10 by the experimenter and transferred to the charity at the end of all the sessions.

On the base of the answers to the questionnaire and on the dictator game, we have some information about our experimental subjects, shown in table 1.

Table 1

	Total	Male	Female
Policy orientation ^(a)	4.6	4.5	4.78
Money ^(b)	3.9	4.125	3.71
Dotation to charity	97	90	103
Age	23.625	23.56	23.68
Subjects	64	32	32

- (a) 1 - very much on the right, 7 - very much on the left
- (b) The answer to the question "How much do you agree with the following sentence: *In life, being economically and financially well-off is the most important thing*" (1 - fully agree, 7 - fully disagree)

While females appear slightly less materialist than males and donate more to charity, these differences do not appear statistically significant².

Then the proper experiment started. Subjects were randomly divided into 4 groups and the experimenter gave 80 tokens to each subject and 200 tokens to each group. Agents were informed that the sum given to the group would be successively divided among group members. All agents were successively randomly assigned to a group different from his/her one: the group on which he/she has the chance to decide the distribution of the group reward.

In table 2, some information taken by the initial questionnaire was shown to agents along with the amount agents gave to the charity organization. Then agents were asked to enter their preferred distribution of the group reward among the members of the group.

Table 2

Subject	Sex	political orientation ^(a)	Money ^(b)	Donation to the charity	Distribution proposed
1	M	4	2	45	
2	F	6	7	150	
3	F	2	6	200	
4	M	4	4	0	

- (c) 1 - very much on the right, 7 - very much on the left
- (d) The answer to the question "How much do you agree with the following sentence: *In life, being economically and financially well-off is the most important thing*" (1 - fully agree, 7 - fully disagree)

² The U Mann Whitney test does not refuse the null hypothesis that the distribution of the female and male are not different with a significance of the 0.05.

Finally, an auction with a single bid is run. Each agent could bid up to 80 tokens that are, the sum they had received by the experimenter as a personal reward. The subject who won the auction saw her proposed distribution implemented. Therefore, by winning the action, an agent acquired the power to decide the distribution of the group surplus among members. Since the subject belonged to a different group, winning the auction did not entail any personal monetary reward. Agents were informed that whenever no one had offered a positive sum, group surplus would have been randomly divided.

Then the game was repeated for 5 times and the groups were randomly rearranged each time.

4 Experimental results

4.1 Result I: power is an economic good.

According to the strait hypotheses of neoclassical economic agents, no one should take part in the auction: it is costly and does not entail any monetary advantage. The optimal sum to offer is therefore zero. Table 3 shows that definitively is not the case.

Table 3

	Male		Female		total	
Average bid	18.15		18.47		18.31	
Bid values						
0	31	19%	24	15%	55	17%
1-10	42	26%	47	29%	89	28%
11-20	19	12%	26	16%	45	14%
21-30	26	16%	38	24%	64	20%
31-40	31	19%	15	9%	46	14%
40-80	11	7%	10	6%	21	7%
total	160		160		320	

The average bid was 18.31. It is useful to remind that the maximum bid was 80 experimental coins and then the average bid was equal to 22.2 % of what they have.

Only 5 agents, three males, and two females, (less than 8%) offer zero in all sessions behaving accordingly the *homo economicus* hypothesis. All the other agents offer a positive sum at least once in the experiment. Agents make a positive offer the 83% of the times. The average winning bid was 36.2, 45 women and 42 men won the auction³. The minimum winning bid was 20 (eleven times the auction was won by offering 20 or 21 experimental coins), the higher winning bid was 77 (there were 3 offers greater than 60).

By looking at the individual behavior, it appears that the agents can be divided into three main groups, see table 4. The first group is composed of agents who were not really interested in taking part in the auction that, in fact, they never won, offering either zero or a very small amount of experimental money (never more than 10). The second group consisted of those making a good offer at least once, really trying to overcome other bids. They wanted to win at least sometimes but they did not offer too much and managed to win only when they were grouped with members of the first group or with subjects similar to them.

Table 4

Agents type	Average bid	Auction won	male	female
I group	0 - 10	0	16	13
II group	11-20	17	7	8
III group	>20	70	9	11

The third group is composed of agents who often try to win the auction offering almost always a high sum of experimental money. This is interesting because it suggests that agents display heterogeneous preferences for power and have a different reserve price for power.

³ The sum is higher than 80, four groups for five sessions each round, because in some cases two agents made the same offer and the leader was randomly chosen between them.

The only possible explanation of this strong and robust result is that power as I have defined it enters directly the utility function of agents. Power is desired by itself for its intrinsic characteristics and most of the agents are willing to pay a non-paltry sum of money in order to buy it⁴.

A point reinforces this result. First of all, since the experiment was conducted ensuring double-blind anonymity, no reputation effects could emerge. One of the advantages of being a powerful individual is that the power position is socially recognizable. In other words, power is clearly a positional and conspicuous good that can be used to conquest, display or defend one’s social status. In the case of the experiment, however, no one knows the name of the leader, but the leader in herself. Therefore, the experimental results appear particular relevant: a positive demand for power still remains even when it is deprived of any social significance. In other words, most of the experimental subjects are willing to spend money also to buy what can be described as secret and hidden power.

Finally, it can be interesting to verify whether there are any determinants of the decision to bid in the action, using the characteristics described in table 1. I run a simple OLS linear regression using the average bid of experimental subjects as the dependent variable and the individual characteristics obtained by the questionnaire as regressors. Results are shown in table 5.

Table 5

Constant	4.65 (8.95)
gender	-1.51 (2,25)
Policy orientation	0,682 (0.788)
Money	1,353 (0.91)
Dotation to charity	0.167* (0.023)
Age	0.22 (0.22)
Obs	64
R ²	0.45
F	11.49*

Standard errors in brackets *p< 0.01%

The regression confirms that the gender of experimental subjects does not affect bid decisions. The only significant regressor is donation. Subjects who donate more are more willing to spend money in order to obtain the right to distribute money among their colleagues. Such a result is less surprising than it would appear at a first glance. Obviously, the amount donated to the charity organization can be seen as an indicator of the degree of altruism of the subject. However, it also affirms the willingness of a subject to have an active role in the general distribution of resources. In fact, she is willing to give up part of the sum received in order to fund a charity which will address social and humanitarian problems. Likewise taking part in the auction is also motivated by the desire of having an active role in the decision of how to distribute a resource pool to a group of subjects giving it to the ones believed by the subjects to deserve it, as it will be discussed later on.

4.2 Result II: no gender effect.

The average bid is almost identical between men and women: women bids are slightly higher but this difference is not significantly different according to Mann-Witney test. As far as the desire to acquire the power to decide the reward of a group of subjects, women and men appear to be very similar: they are willing to spend the same amount of money. If there are differences, although not significant, they are in favor of greater involvement of women in the pursuit of power.

In the present setting, the leadership position does not encompass any monetary advantage, either direct or indirect, since the leadership position was not publicly observable. Therefore, we can interpret the wish to win the auction as the desire to acquire the leadership in order to have the power to decide. As regards to the preference for power, thus, the results of this experiment seem to suggest that there is not any gender difference.

⁴ It’s worth noting that the maximum bid offer was 80 experimental coins.

This outcome can add a completely new insight into the issue of the relationship between gender and competition: the gender gap often found by laboratory and field experiments does not depend on a different preference for power and leadership. As far as the lust for power women and men are identical. Power as the chance of deciding other destiny exercises its charm on men and women in the same way. In other words, this result suggests that the gender gap in competition does not depend on the different value assigned to the final goal, reaching a leadership position, between men and women. Taking into account the main possible drivers of the different attitude towards competition as discussed by Niederle and Vesterlund (2011) - differences in beliefs, differences in risk attitude, differences in other-regarding behavior - we should notice they do not seem to fit in this case, at least as regards the first two.

Since there is not any contest based on individual ability to win, the fact the women are found to display lower confidence in their ability cannot play any role. The auction is imagined to elicit the willingness to pay for power; in other words, power can be simply bought and it is not the prize of the game whose result depends on some kind of individual skill. Moreover, since winning the auction and obtaining the right to decide does not encompass any personal monetary advantage, the role of risk aversion is very limited if not completely irrelevant.

Finally, my results seem to confirm that women are more altruistic than men (Croson and Gneezy, 2009); they give to charity more than men, although this result is not statistically significant. Therefore, the other regarding the attitude of women probably plays a role in explaining my results. As a matter of facts, we could agree upon the fact that competing for power in my framework is a more altruistic activity than a selfish one. It is costly and it does not ensure any materialistic benefit; moreover, the anonymity of the experiment does not provide any indirect benefit in terms of social reputation. Therefore, we cannot exclude that the altruistic content of my definition of power could have had a role in enhancing the willingness of women to compete for power.

Moreover, given the simple framework that I have used, our results strongly suggest that there is no gender difference in the preferences for pure power. This remark can help us in explaining, at least partially, the difference between this paper and the paper by Bosco (2012). In a framework very similar to my one, the author found a remarkable gender effect, suggesting that women are less attracted to and trapped by competition for power⁵. However, in his setting, the agents can trade power for altruism by playing dictators and ultimatum game to climb the hierarchical ladder in order to acquire decision power; that is, less altruistic the agent, more likely his/her leadership is. Therefore, in Bosco (2012) the agents can trade power for altruism, while in this setting the agents can trade power for the money. The two frameworks are similar as far as the way in which power is defined, but they differ significantly with regard to the cost of power. Altogether women are as attracted as men to power when the price for power is money but they are less attracted when the price is perceived as higher by entailing being more selfish. This is perfectly coherent with the well-known experimental outcome suggesting a higher level of other-regarding preferences of women.

4.3 Result III: agents distribute the group surplus favoring subjects similar to them.

It can be of some interest to see how the agents decide to divide the group surplus among members. It is worth reminding that all agents are required to provide a distribution of the 200 experimental money given to the group among the members after receiving information on five characteristics of the group members (see table 1): gender, political orientation, a simple measure of their degree of materialism⁶, the sum given to the charity at the onset of the experiment. Quite interestingly the main criterion that can be identified is that subjects tend to prefer agents with a profile similar to them.

I construct a simple index of the distance of the characteristics of the group members with respect to the decision maker⁷. It can be said that this index measures the degree of diversity between members, by telling how much the decision maker is different from the receiver. The correlation rate between the sum assigned to the receiver and this index measuring is equal to -0.317 and it is statistically significant at 0.01 level. It means that they tend to assign less to agents who are more dissimilar from them. At last, it is worth disaggregating the effect of every single difference and evaluating whether there is a gender effect in the assignment decision.

⁵In Bosco's experimental agents were divided into groups and played a series of dictator and ultimatum games with the members of other groups; for each experimental euro individual subject earned, the experimenter assigned half of it to the group. In the power setting there was a ranking of the earnings in the group, and the subject who had earned the largest sum was given the power to decide the distribution scheme of the surplus for a group different from his/her own.

⁶ The answer to the question "How much do you agree with the following sentence: In life, being economically and financially well-off is the most important thing" (1 - fully agree, 7 - fully disagree)

⁷ The index is an average of the different between the value of the decision taker and the value of the decision maker, normalized to one. The index is zero if the agent decided and the agent deciding have the same characteristics and it is zero if they are orthogonally different.

I ran a linear regression where the dependent variable is the sum assigned by the agents to each member of the group the agents are assigned to. The independent variables are the measures of the difference with regards to the various characteristics normalized to one, i.e. sex is equal to one when agents belong to a different gender otherwise it is equal to zero, donation is equal to zero if both agents donate to charity the same sum and it is one if one agent donates the maximum (200) while the other the minimum (0) or to 0.25, for example, if the difference between the two donations is equal to 25% of the maximum sum and the same it is true for the other values ⁸.

Table 6

	All	Men	Women
Constant	0,453** (0.045)	0,440** (0.042)	0,463** (0,47)
sex	-0,007 (0.23)	-0,085* (0.039)	0,014 (0.30)
policy	-0,125* (0.047)	-0,062 (0.081)	-0,185* (0.03)
money	0,003 (0.065)	0,045 (0.073)	-0,065 (0.087)
donation	- 0,305** (0.048)	-0,325** (0.053)	-0,273** (0.047)
Obs	320	160	160
R	0,233	0.314	0.265
F	23,603**	14,114**	11,121**

* indicates significance at the 5% level ** indicates significance at the 1% level
standard errors in brackets

Results are shown in table 6. A gender difference emerges. Men tend to give less to female, while female distributions tend to be gender insensitive. While women seem to give significantly more to other subjects with political ideas similar to them, for men these results are not significant. Male and female tend to give more to subjects who have behaved like them during the dictator game. I can tentatively conclude that each subject tends to give more to the person who deserves it more because she is similar to her.

5. Conclusion

Previous research on competitiveness showed an important gender effect, especially among young people. Laboratory and field experimental evidence displayed that men tend to be more competitive than women suggesting a gender difference in preferences. It could be argued, a difference in preferences could contribute to explain, the observed gender difference in the relative economic outcome. My experiment sheds some interesting lights on this issue.

In the laboratory, it has been created an artificial situation in which experimental subjects were given the chance to compete for power. They had to decide whether to make a bid to win an auction which would enable them to distribute a sum of money among a group of four experimental subjects different from themselves. This form of power is minimal: it does not entail any monetary advantage and, since it is not publicly visible, it does not ensure any non-monetary social benefits. In other words, being the winner of the auction and then the leader of the group does not bring about any other advantage either monetary or not monetary.

If the experimental subject were a *homo economicus*, that is, selfish and only interested in the monetary reward, the optimal bid offer would be zero. My results suggest that it will be not the case. The average bid is about the 22% of the maximum sum that agents can invest in the auction and less than 8% of the subjects are bidding zero thus behaving as the traditional theory would have forecasted. A tentative conclusion is that power, in the way we defined it, is an economic good in itself. This is something new since generally it is believed that power is an indirect good, useful if it enables us to obtain a monetary or non-monetary advantage.

More interestingly no gender difference emerged. The average bid of men and women was not statistically different. Males and females seem to like power, in the same way, competing for it in a similar way. The auction winners (the subjects who made the highest bid) were more females than male (52% and 48 respectively). Therefore, women seem to like power in the same way as men do and they are willing to pay or to incur in a monetary cost in order to have it.

⁸ The index is calculated as $I_{ji} = \frac{|I_j - I_i|}{\bar{I}}$ where I_j is the value of the agents j who is deciding the distribution, I_i is the value of the agent, member of the group on which agents j has the chance to decide on, and \bar{I} is the maximum value of I .

They are as competitive as men in the market for power when power simply means to have the right to modify actively the external world.

Finally, it cannot be ignored that this paper shares an important drawback with most of the literature using a laboratory experimental methodology. Since I used young students as experimental subjects, some doubts can be reasonably raised on the generalization of the results. Moreover, it has been already noticed that the relationship between gender and power seems to depend on the age of women (Boschini, et al, 2018, and Flory, et al, 2018). On the other hand, their results seem to show that the competition attitude of women tends to increase with age; therefore it seems difficult that considering a more representative sample we can observe that women tend to compete for power less than men. Anyhow further research will be welcome.

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