Fairness and Willingness to Compete

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Abstract:

The large experimental literature on competitiveness has typically ignored a key feature of many competitive settings in society: competition is not always fair. The playing field may be uneven and competitors of unequal strength. In our experiment, we systematically vary the fairness of the competition setting. We find that concerns for the chance of winning trump concerns for fairness for most, but not all, people. A majority of participants who compete under fair circumstances are willing to impose competition on opponents who have been exogenously handicapped or are known to be weaker. A majority are also willing to sabotage the performance of their opponent to increase their own chances of winning. However, a large minority do not exploit the costless opportunity to sabotage the performance of their opponent, suggesting at least some concerns for fairness. Our results are relevant for management practices, in particular for the decision to introduce competitive mechanisms in businesses and organizations. By studying gender differences under a range of novel competitive settings, we also shed new light on the much-discussed gender difference in willingness to compete.

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1. Introduction

We study the role of fairness in determining willingness to compete against others. A large literature uses incentivized choice experiments to document individual and gender differences in willingness to compete (Croson and Gneezy, 2009; Niederle and Vesterlund, 2011; Niederle, 2016) and their relevance for career outcomes (Buser, Niederle and Oosterbeek, 2014; Reuben, Sapienza and Zingales, 2015).[1][2] The standard experimental design is based on Niederle and Vesterlund (2007). Their paper, and much of the follow-up literature, is focused on documenting gender differences in the taste for competition and the choice task is therefore designed to exclude any other possible determinants of a gender gap in competition entry. Specifically, competitiveness is measured as the willingness to compare one's own performance in a real-effort task against the past performances of a randomly selected group of opponents. The choice of competing is purely individual and does not affect anyone else's payoff. Any role for fairness concerns in determining willingness to compete is therefore excluded by design.

The standard design eliminates a key feature of many competitive settings: competition is not always fair. Colloquially, competition can be seen as unfair in two ways. First, competition is unfair if the playing field is uneven because one of the competitors is given a handicap or an advantage that others do not have. For example, in a promotion contest, one candidate may be favored from the outset because of close personal connections with management, or a job applicant might receive exclusive information because of personal connections within the organization. Second, competition can be unfair if one of the competitors is known to be much stronger than the others and therefore highly likely to win. This especially applies to situations where weaker competitors are forced into competition, for example because of the introduction of relative bonus schemes. In organizations, the extent of competition between employees – and the fairness of the competitive setting – is often at least partially at the discretion of management. Whether, and to what extent, employees exploit unfair advantages or even engage in sabotage when competing is important to know for a manager when considering whether to introduce competitive incentive schemes.

In this paper, we use a within-subject experiment to examine how the decision to compete against another individual varies depending on the fairness of the competitive setting. In

[1]

[2] Buser, Niederle and Oosterbeek (2014) and Buser, Peter and Wolter (2017) show that an incentivized measure of competitiveness predicts specializing in more prestigious and math-heavy subjects for Dutch and Swiss secondary-school students from the top of the ability distribution (pre-university track). Reuben, Sapienza and Zingales (2015) show the same for the starting salaries and industry choices of MBA graduates. Other studies find that competitiveness predicts participating in a competitive high school entrance exam (Zhang, 2012), investment choices of entrepreneurs (Berge et al., 2015), choosing an ambitious college track in high school (Almås et al., 2016), future salary expectations of undergraduate students (Reuben, Wiswall and Zafar, 2017), career choices at the vocational education level (Buser, Peter and Wolter, 2018), and labor market outcomes (Buser, Niederle and Oosterbeek 2020). Flory, Leibbrandt and List (2015). Samek (2019) run field experiments recruiting people for real jobs and show that compensation schemes which depend on relative performance deter women from applying relative to men.

our design, winning the competition means the opponent loses and receives nothing.[3] Participants are randomly and anonymously paired with another participant and choose between competitive and individual incentives for completing ten simple sums under different conditions. Under competition, the person who completes the sums fastest receives a prize while the other gets nothing (first-past-the-post competition). Under individual incentives, each participant receives half the prize money with certainty simply for completing the sums. The competition choice is unilateral and choosing competitive incentives therefore means that the opponent is forced into competition. The competition choice is made under six different conditions, across which we vary the evenness of the playing field and the strength of the opponent. In a final seventh decision, participants decide whether they want to sabotage the opponent's performance in a fair competition by tilting the playing field in their own favor.

The within-subject nature of our design allows us not only to document average willingness to compete in each condition, but also to document whether the same individuals compete under fair and unfair circumstances. When a competition is unfair to the decision maker's advantage, fairness considerations and selfish considerations work in opposite directions: fairness concerns make competition less attractive, whereas the increased chance of winning makes competition more attractive. In contrast, fairness and selfishness pull in the same direction when the unfairness is to the decision maker's disadvantage. In terms of sabotaging in a competition, there is also a trade-off between concerns for fairness, pulling in the direction of no sabotage, and selfishness, pulling in the direction of sabotage. We further use the within-subject dimension to ask how the willingness to compete in different conditions is associated with the willingness to sabotage a competitor.

Our results show that, for a majority of individuals, fairness concerns do not play a decisive role when deciding whether to compete. They are willing to impose competition on an opponent whose performance is exogenously handicapped or who is known to be weaker. Furthermore, a majority of participants are not only willing to enter an unfair competition, but also to actively tilt the playing field in their own favor to increase their chances of winning. Nonetheless, we also note that fairness in competition matters for a large minority, who refuse the costless opportunity to sabotage the performance of their opponent.

Taking advantage of the within-subject structure of our data, we further show that nearly all participants who are willing to compete when competition is fair are also willing to do so in unfair settings. Moreover, many individuals who are not willing to compete under fair circumstances do so when they know that their opponent is handicapped or weaker. Based on the observed choices, we provide a classification of participants into four competition types: competition-averse (never competing), competitive (competing in all conditions),

[3] We also implemented a between-subject experiment to compare the willingness to compete of participants when competition creates a loser to the willingness to compete when the competition outcome does not affect the payoff of the opponent. We do this under two scenarios, one where the opponent self-selected into competition and one where the opponent has no choice but to compete. We find that competition entry rates hardly vary across treatments. That is, a similar proportion of participants choose to compete whether or not winning creates a loser, and this is true whether the opponent self-selected into competition or whether the opponent was forced to compete. Further details of the between-subject design are provided in the online appendix.

selfish (competing in at least one of the two unfair conditions, but not in all the other conditions), and fair (not competing in the two unfair conditions but competing in at least one of the fair conditions). Around a quarter of participants are competitive or competition-averse. Of the rest, that is those who compete sometimes but not always, a large majority is classified as selfish and only a negligible minority of the participants as fair.

The present paper provides, to our knowledge, the first study of fairness in competition. A large experimental literature has documented that fairness considerations shape individual behavior in distributive contexts (Fehr and Schmidt, 1999; Bolton and Ockenfels, 2000; Konow, 2000; Falk, Fehr and Fischbacher, 2003; Cappelen et al., 2007; Falk, Fehr and Fischbacher, 2008; Almås et al., 2010; Cappelen et al., 2013; Durante, Putterman and van der Weele, 2014; Cappelen and Tungodden, 2019; Almås, Cappelen and Tungodden, 2020), but also that certain settings, such as markets, can drive out fairness concerns and other moral considerations (Bowles, 1998; Vohs, Meade and Goode, 2006; Sandel, 2012; Savani and Rattan 2012; Besley 2013; Falk and Szech, 2013; Bartling and Weber, 2015; Kirchler et al. 2016; Bartling and Özdemir 2017; Ziegler, Romagnoli and Offerman, 2020; Bartling, Fehr and Özdemir, 2021). We contribute to this literature by examining the role played by fairness concerns for choices in competitive settings. Our results suggest that selfish considerations are more important than fairness considerations for competition choices. This may also shed light on why some people are less prosocial in markets, since competition is a key feature of most markets.

We also contribute new insights to the literature on gender differences in competitiveness. We show that the gender gap in willingness to compete is robust to a setting where competition affects the payoff of the opponent, and we provide new evidence suggesting that the gender gap cannot be fully explained by gender differences in confidence. We find mixed evidence for gender differences in the willingness to compete under unfair circumstances. Women are slightly less likely to take advantage of an uneven playing field and less likely to sabotage their competitor. Interestingly, however, a large majority of women are willing to impose competition when the opponent is known to be weaker, which nearly eliminates the gender gap in willingness to compete in this condition.

Finally, our study contributes to the wider literature on the sorting effects of incentive schemes (e.g. Dohmen and Falk 2011), in particular to the still small literature on the impact of using competitive incentive schemes on worker's characteristics and choices that are not directly related to productivity. The experimental literature on competition entry documents that competition selects individuals who are risk-seeking, confident and disproportionally male (Niederle 2016). Bartling et al. (2009) moreover find that individuals who choose to compete are less egalitarian.[4] We contribute to this literature by looking at whether individuals who are more attracted to competitive settings are also more willing to engage in unfair behavior in a competition, defined as the willingness to sabotage the performance of a competitor. We find that this is not true per se: individuals who are attracted to competition under all circumstances are no more willing to sabotage than are competition-averse individuals. However, participants who choose competition only when

[4] In particular, they find that individuals who are averse to being ahead in a social preference game are less likely to choose to compete. It is important to point out that in their setting, as in most of this literature, the decision to compete did not affect anyone else's payoff.

they have an unfair advantage are also more likely to engage in sabotage when given the opportunity, suggesting that unfair competitive settings may attract people willing to engage in unfair behavior.[5]

Our results are directly relevant for management practice. Organizations can influence the competitiveness of inter-employee interactions in many ways, not only through the design of incentive and promotion schemes, but also through corporate culture, that is, through fostering either competitive or cooperative norms of interaction. Moreover, employees who are competitively inclined can create a competitive environment, thereby affecting coworkers who would rather work in a more collaborative setting. Our results suggest that most people cannot be relied upon to act fairly when making decisions in a competitive setting or when left to decide whether to initiate competition. They seize an unfair advantage when it presents itself, actively sabotage others to obtain such an advantage, or force weaker opponents into competition.

The remainder of the paper is organized as follows. In Section 2, we introduce the experimental design and describe the data. In Section 3, we present the main results and in Section 4, we analyze gender differences in our results. Section 5 concludes.

2. Experimental design and data

The sample consists of two waves of incoming economics students at the Norwegian School of Economics (NHH) in Bergen, Norway. The experimental sessions were conducted in late September and early October 2018 and 2019.[6] Participation in the experiment was part of the class requirements of the introductory economics course. The experimental sessions were conducted in a computer lab using a web-based interface and were double-blind; i.e., neither the subjects nor the experimenters could associate decisions with particular subjects. Participants were told they would receive a show-up fee and that they could earn more money in the experiment. The sessions lasted for about one hour. The experimental sessions consisted of two parts: a between-subject experiment reported in the online appendix (conducted first) and the within-subject experiment reported in the main part of the paper. All results for the within-subject experiment are robust to controlling for the treatment participants were allocated to in the between-subject experiment.

In the within-individual experiment, participants complete a baseline round, where they are anonymously paired with another participant. They are informed that the participant who

[5] Because the outcome of a tournament depends on relative rather than absolute performance, competitive pay may create incentives for behavior that is bad for overall productivity, such as sabotage of competitors (Chen, 2003). Harbring and Irlenbusch (2011) show that in a repeated tournament in the lab, a higher wage spread leads to more sabotage. Charness, Masclet and Villeval (2014) show that ranking incentives induce individuals to engage in sabotage and to artificially enhance their own performance. Buser and Dreber (2016) find that competitive incentives can spill over to reduce willingness to cooperate in a seemingly unrelated setting.

[6] The experimental design in two waves is identical, except that we also implemented a sabotage decision in 2019. See the complete set of instructions in the online appendix.

would first complete ten simple addition tasks, adding up sets of four two-digit numbers, would earn 200 Norwegian Kroners (NOK, around 20 Euro), while the slower participant would earn nothing (first-past-the-post competition). The performance in this round gives us a baseline measure of performance under competition.

Participants are then paired with a randomly selected other participant and asked to decide on the incentive scheme that will be applied to the final performance of both participants in the pair under six different conditions. In particular, they choose between a first-past-the-post competition or individual incentives for both participants. If individual incentives are chosen, each of the two participants in a pair earns 100 NOK for finishing the ten problems, no matter the time they take to do so. If competition is chosen, the participant who completes the sums fastest receives a prize of 200 NOK while the other gets nothing. The participant decides both for themselves and for the randomly chosen opponent in each of the six conditions, which means that they impose competition on the opponent if they choose the competitive incentive scheme.

The participants decide between competition or individual pay both under *fair competition* and under *unfair competition*. We consider two types of unfair competition: competition on an uneven playing field and competition between participants of unequal strength. We consider both situations where the unfairness is to the advantage and situations where the unfairness is to the disadvantage of the decision maker. Participants decide between competition and individual incentives in the following six conditions.

Evenness of playing field
Fair: Compete against a randomly selected opponent
Advantage: Compete against a randomly selected opponent with a bonus of 20 seconds deducted from the final time
Disadvantage: Compete against a randomly selected opponent with a penalty of 20 seconds added to the final time

Equality of match
Fair: Compete against an opponent who performed equally well (+/- 20 seconds) in the baseline round
Advantage: Compete against a randomly selected opponent who was at least 20 seconds slower in the baseline round
Disadvantage: Compete against a randomly selected opponent was at least 20 seconds faster in the baseline round

In a final decision, we study whether participants are willing to turn a fair competition against a random stranger into an unfair competition to their own advantage. In this decision, participants could choose whether to tilt the playing field in their own favor by adding 20 seconds to the time of their opponent. We refer to this choice as the *sabotage* decision.[7]

[7] One part of the experiment (between-subject experiment, baseline round or within-subject experiment) was randomly chosen for payment ex-post. In case the within-subject experiment was chosen for payment, one of the seven decisions of one of the two members of each pair was then randomly chosen and applied to the final performance to determine the payment of both participants in the pair.

At the very end, we collect data on risk preferences, beliefs about relative performance (confidence), gender, and age. We elicit risk preferences with the following question taken from Dohmen et al. (2011). “How do you see yourself: are you generally a person who is fully prepared to take risks or do you try to avoid taking risks?” (scale: from 0 ‘not at all willing to take risks' to 10 'very willing to take risks'). We elicit confidence with the following question. “How fast do you think you performed (on average) in the tasks compared to the other students who participated?” (scale: from 1 ‘Slowest 10%’ to 10 ‘Fastest 10%’).

Table 1: Descriptive statistics

	Whole sample:	Women:	Men:	Difference:
Baseline round time	291.0	294.5	289.0	5.4
	(110.8)	(102.3)	(115.6)	(8.1)
Risk seeking	5.5	4.7	6.0	-1.3***
	(2.0)	(1.7)	(1.9)	(0.1)
Confidence	5.5	4.9	5.8	-1.0***
	(2.0)	(1.6)	(2.1)	(0.1)
Age	20.5	20.1	20.8	-0.6***
	(2.0)	(1.5)	(2.2)	(0.1)
Observations	802	295	507	802

Note: This table reports means for a set of individual characteristics (standard deviations in parentheses) by gender. Baseline round time is measured in seconds. Risk seeking and Confidence are measured on a scale from 1 to 10. Age is measured in years. The last column shows the gender difference for each variable. Standard errors and significance levels are from t-tests.

Table 1 shows descriptive statistics. The sample consists of 802 participants (406 in 2018 and 396 in 2019), 36.8 percent being women. Men and women perform very similarly in the baseline round, with a gender difference in favor of men of 5.5 seconds to complete the task ($p=0.536$; Wilcoxon rank-sum test). Men rate themselves as significantly more risk seeking (1.3 points higher on a 10-point scale; $p<0.001$) and more confident with respect to their relative performance on the task (0.9 points higher on a 10-point scale; $p<0.001$). Women are on average slightly younger than the males ($p<0.001$).

3. Main results: Fairness and competition

In this section, we will tackle our main research question of whether fairness concerns matter for decision making in competitive contexts. We first provide a discussion of aggregate patterns to examine whether, overall, fairness concerns or selfish monetary concerns dominate in competition choices. We then look at how decisions vary across conditions within subject. Are individuals who initiate competition against a random opponent on an even playing field also willing to compete when the playing field is tilted in their favor or disfavor? And are individuals who choose competition against an equal willing to compete when the opponent is known to be weaker or stronger? Finally, we look at whether participants are willing to sabotage their opponent and at the relationship between willingness to compete under different conditions and willingness to sabotage.

In Figure 1, we show how the proportion of participants who choose to impose competition on their opponent varies across the six conditions. Our main interest lies in comparing the willingness to take part in a fair competition with the willingness to compete when the decision maker is at an unfair advantage. In this case, the decision maker must trade off fairness considerations and selfish considerations. We also compare with the case of an unfair disadvantage, where we expect to see a lower willingness to compete, since both fairness considerations and selfish considerations make competition less attractive.[8]

In the left-hand panel of Figure 1, we compare competition entry against a randomly chosen opponent on an even playing field (left) to competition entry when the decision-maker receives a bonus of 20 seconds (center) or a penalty of 20 seconds (right). Moving from the even playing field to a playing field where one has an advantage, fairness considerations and selfish considerations pull in opposite directions. We observe that on an even playing field, 45 percent of participants choose competition. With an unfair advantage, the proportion willing to compete increases to 53 percent ($p<0.001$; Wilcoxon signed-rank test). The data therefore show that, for the typical participant, selfish considerations dominate fairness considerations. Moving from the even playing field to a playing field where one has a disadvantage, fairness considerations and selfish considerations pull in the same direction, making competition less attractive. In line with this, we observe a large drop in the share choosing to compete (right): from 45 percent of participants to 29 percent ($p<0.001$).

In the right-hand panel of Figure 1, we compare competition entry against an opponent of similar ability to competition entry when participants know their opponent is weaker or stronger. When the opponent is known to be of similar ability (left), 41 percent of participants choose competition. When the opponent is known to be weaker (center), the proportion willing to impose competition on their opponent strongly increases to 80 percent ($p<0.001$). Thus, we again observe that for a significant share of participants, selfish considerations appear to dominate fairness considerations. As expected, when facing a stronger opponent, there is a significant drop in the proportion choosing competition. Only 14 percent choose to compete in this condition ($p<0.001$).

Taken together, we can summarize our first main result:

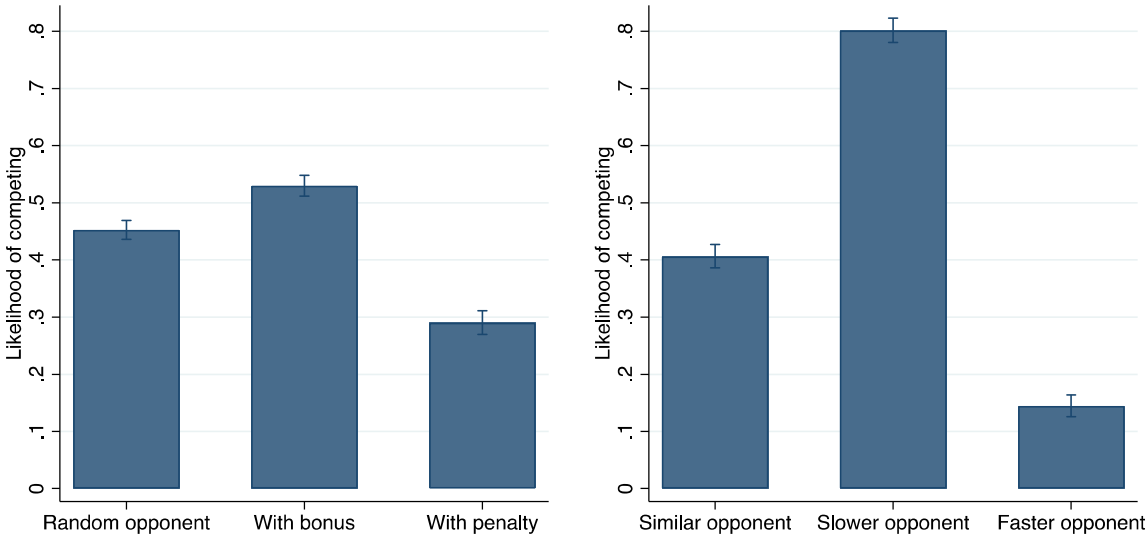
Result 1: *Selfish considerations on average trump fairness considerations when participants decide whether to compete. A majority of participants are willing to impose competition on an opponent over whom they have an unfair advantage.*

We now turn to a within-individual analysis of the competition choices. This allows us to decompose the aggregate effect of introducing an unfair advantage into (i) participants who compete when it is fair but refrain when they receive an exogenous advantage, and (ii)

[8] Based on final performances, the unfair advantage of a 20-second bonus increases the chance of winning by 5 to 10 percentage points, depending on the participant's place in the performance distribution. Facing a slower rather than equal opponent has a stronger impact on the likelihood of winning, increasing it by around 20 percentage points on average. We did not elicit the participants' beliefs about how much the unfair advantage and the weaker opponent increased their chance of winning. Hence, we do not focus on comparing the size of the effects between these two types of advantages, but rather on the direction of the effects.

participants who do not compete under fair circumstances but are enticed to compete when they are at an advantage. We can similarly decompose the aggregate effect of introducing an unfair disadvantage.

Figure 1: Between-condition analysis: Competition choice

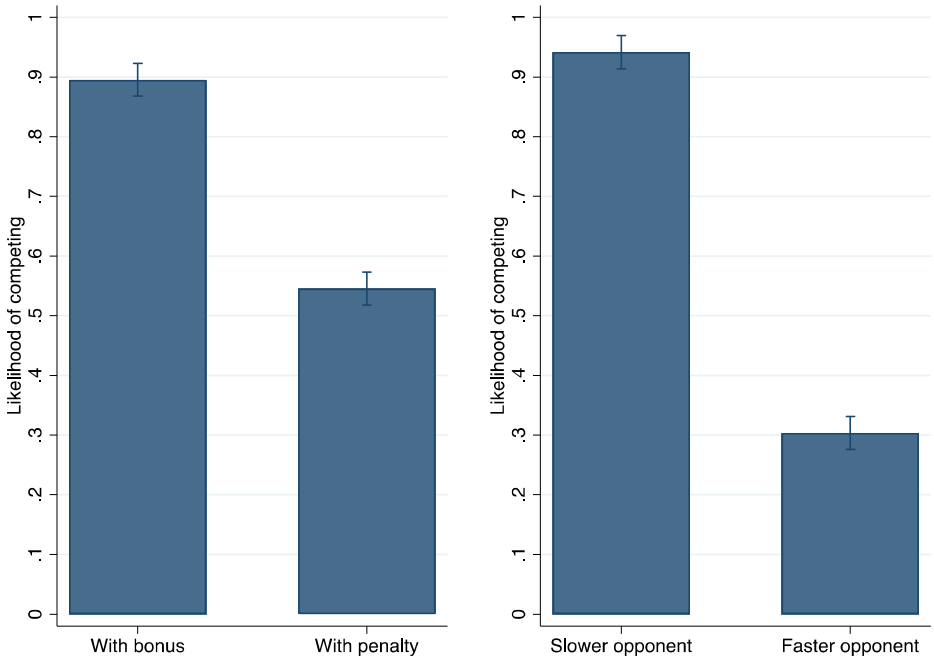


Note: The graphs show the proportion of participants who choose competition in each condition. Error bars show 95-percent confidence intervals obtained from regressions of a competition dummy on decision scenario dummies, controlling for individual fixed effects (standard errors are clustered at the individual level).

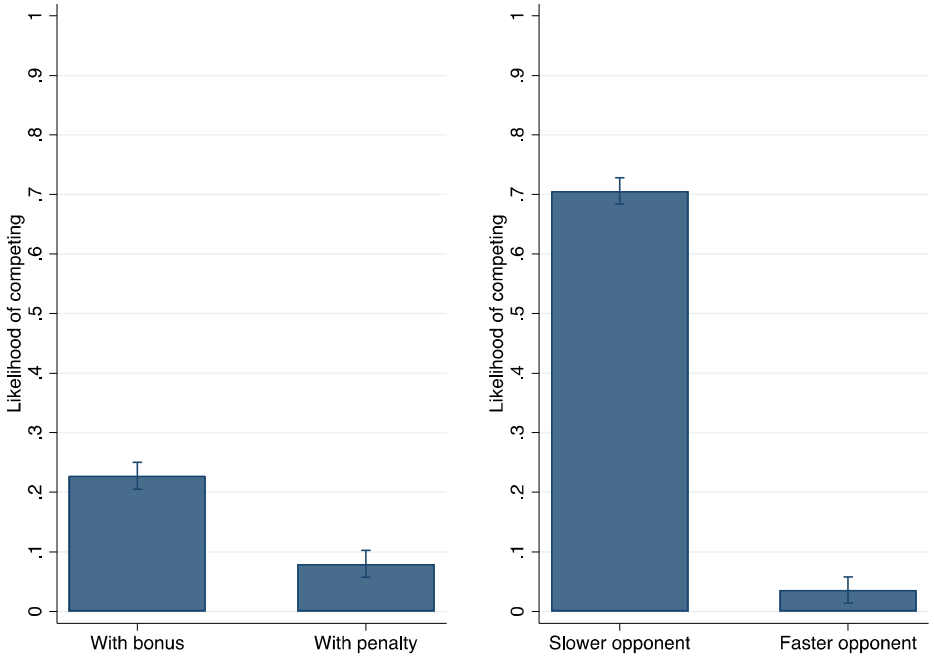
The upper panel of Figure 2 shows the proportion of participants who choose to impose competition on their opponent in the unfair conditions for the subsample of participants who choose competition in the fair conditions (against a random or similar opponent). Considering the decision to compete on an uneven playing field (left), 90 percent of individuals who impose competition on a random opponent are still willing to do so when they receive an exogenous advantage. Similarly, 94 percent of those who chose competition when faced with an opponent of similar ability also choose competition when faced with a weaker opponent (right). Hence, only for a small share of those who are competitive under fair circumstances do fairness considerations outweigh selfish considerations when they receive an unfair advantage. In the lower panel, we show the choices of individuals who do not compete in the fair conditions. We observe that for a significant share, receiving an unfair advantage entices them to choose competition. In particular, we observe that a majority – 71 percent – of those who do not choose competition against an opponent of similar strength choose to impose competition on a weaker opponent, showing that selfish considerations trump fairness considerations also for the majority of individuals who are not willing to enter a fair competition. Finally, 23 percent of individuals who do not compete against a random opponent on an even playing field choose to compete when they receive a bonus.

Figure 2: Within-individual analysis: Competition choice

Participants who compete under fair competition :



Participants who choose individual incentives under fair competition:



Note: The upper panels show the choices of participants who choose competition against a randomly selected opponent (left panel) or against a similar opponent (right panel): the proportion that chooses competition with an advantage and with a disadvantage. The lower panels show the corresponding choices for the participants who choose not to compete against a randomly selected opponent (left panel) or against a similar opponent (right panel). Error bars show 95-percent confidence intervals obtained from regressions of a competition dummy on decision scenario dummies controlling for individual fixed effects (standard errors are clustered at the individual level).

As expected, we observe from Figure 2 that an unfair disadvantage causes a large drop in willingness to compete among those who choose competition in a fair condition. Only 55 percent of those who compete against a random opponent are still willing to compete when the opponent receives the exogenous advantage, and only 30 percent of those who compete against an opponent of similar ability choose competition against a stronger opponent. We note that only few of those who do not compete in a fair condition compete with a handicap or against a stronger opponent (8 and 4 percent respectively), which suggests that our data are in line with the participants making a tradeoff between selfish and fairness considerations in their competition choices and are not very noisy.

Result 2: *The large majority of participants who compete under fair conditions are also willing to compete when they have an unfair advantage. A large proportion of participants who do not compete under fair conditions are enticed to compete when they receive an unfair advantage.*

We can classify participants into four types according to their choices in the six competition conditions. We identify participants as "competition-averse" if they never compete, as "selfish" if they compete in at least one of the two unfair conditions (but not in all other conditions), as "competitive" if they compete in all six conditions, and as "fair" if they do not compete in either of the unfair conditions but in at least one of the other conditions. Table 2 shows the proportion of each competition type for the whole sample and by wave and gender. In the pooled sample, a majority of 73 percent are classified as selfish. 15 percent are competition-averse and 9 percent are competitive. Only 2 percent are classified as fair, which again suggests that selfish considerations are much more important drivers of competition decisions than fairness. The patterns are very similar between the two waves. We return to the gender difference in the following section.

Finally, we turn to the sabotage choice, where the participants could tilt a fair competitive environment in their favor by imposing a time penalty on the opponent. Again, we observe that selfish considerations on aggregate trump fairness considerations: a majority of 61 percent of the participants choose to sabotage the performance of their opponent. However, this result also shows that a large minority of the participants assign some weight to fairness considerations in a competitive environment, since they do not exploit a costless opportunity to receive an unfair advantage.

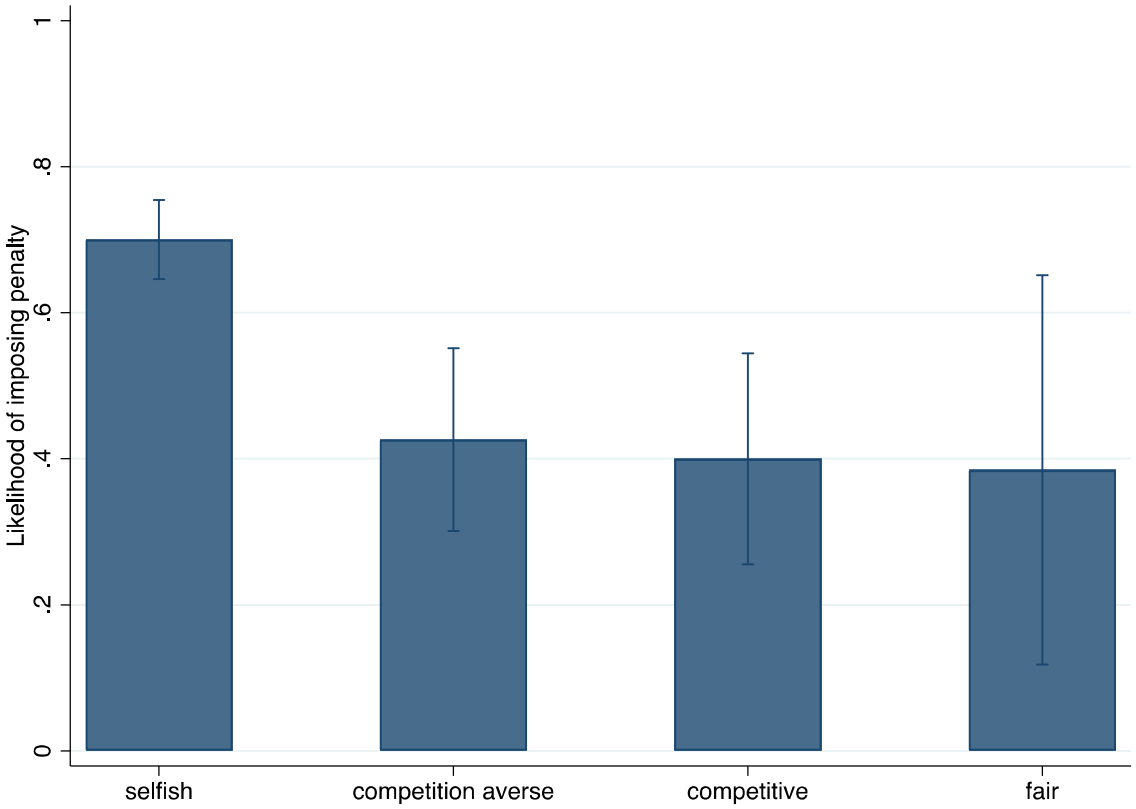
Table 2: Competition types

	All	Men	Women	Wave 1	Wave 2
Selfish	0.73	0.71	0.77	0.76	0.70
Competition-averse	0.15	0.14	0.18	0.16	0.15
Competitive	0.09	0.13	0.02	0.07	0.11
Fair	0.02	0.02	0.03	0.01	0.03
N	802	507	295	406	396

Note: The table shows the proportion of participants in each category. We identify participants as "competition-averse" if they never compete, as "selfish" if they compete in at least one out of the two unfair conditions (but not in all other conditions), as "competitive" if they compete in all six conditions, and as "fair" if they do not compete in either of the unfair conditions but in at least one of the other conditions.

Figure 3 shows how the propensity to sabotage the opponent varies across the four competition categories introduced in Table 3. We observe that selfish participants are much more likely to sabotage their opponent than the other participants: 71 percent of selfish participants choose to impose the penalty versus 41 percent of participants across the other three categories ($p<0.001$; Fisher's exact test of the difference between selfish participants and the rest). This finding suggests that individuals who are specifically willing to enter unfair competitions are also more likely to act in an unfair way when competition is exogenously imposed. We further observe that the propensity to sabotage is virtually identical across the other three categories. Individuals who always compete (and therefore presumably enjoy competition for its own sake) are no more likely to sabotage than those who never compete or those who compete only when it is fair to do so. However, we should note that few participants are classified as fair, which implies that this share is less imprecisely estimated.

Figure 3: Sabotage decision by competition type



Note: The graphs show the proportion of participants by competition type. We classify participants as "competition-averse" if they never compete, as "selfish" if they compete in at least one out of the two unfair conditions (but not in all other conditions), as "competitive" if they compete in all six conditions, and as "fair" if they do not compete in either of the unfair conditions but in at least one of the other conditions. Error bars show 95-percent confidence intervals obtained from a regression of a sabotage dummy on classification dummies.

In Table 3, we report OLS regressions of a binary sabotage indicator on category dummies where we control for gender, baseline performance and confidence.[9] We control for baseline performance and confidence either linearly (columns 1 and 3) or more flexibly by including dummies for different levels of the variables (columns 2 and 4). In the regressions reported in columns 1 and 2, we include a binary indicator for being selfish, comparing selfish participants to all other participants. We observe that the relationship between being selfish and sabotaging is highly robust to including a set of controls. Selfish participants are nearly 30 percentage points more likely to sabotage than the competition-averse, competitive and fair participants. We also note that the decision to sabotage is unrelated to baseline performance and confidence. In columns 3 and 4, we include dummies for each competition type, using competition-averse participants as the baseline category. The differences between competition-averse, competitive and fair participants are small. Note, however, that the associations for the competitive and fair participants are less precisely estimated.

We summarize our findings for the sabotage choice as follows:

Result 3: *The majority of participants are willing to sabotage their opponent to give themselves an unfair advantage, but a large minority are not. Participants who are specifically attracted to unfair competition are more likely to impose an unfair disadvantage on their opponent.*

Table 3: Propensity to sabotage across competition types

	(1)	(2)	(3)	(4)
Baseline	*rest*	*rest*	*competition averse*	*competition averse*
Selfish	0.296***	0.292***	0.266***	0.272***
	(0.053)	(0.057)	(0.071)	(0.074)
Competitive			-0.067	-0.020
			(0.104)	(0.111)
Fair			-0.045	-0.112
			(0.149)	(0.159)
Female	-0.129**	-0.129**	-0.133***	-0.130**
	(0.050)	(0.052)	(0.051)	(0.053)
Baseline round time	0.002		0.002	
	(0.013)		(0.013)	
Confidence	-0.007		-0.005	
	(0.014)		(0.014)	
Dummy controls		x		x
N	396	396	396	396

Note: The coefficients are from OLS regressions with a sabotage dummy as the dependent variable. "Dummy controls" means that we control for beliefs and baseline performance in a more flexible way by including a dummy for each possible belief level from 1 to 10 and each rounded number of minutes spent on solving the task in the baseline round (minimum:2; maximum: 17; with 99 percent solving the task in 10 minutes or less). Robust standard errors in parentheses; *p<0.1, **p<0.05, ***p<0.001.

[9] We also include a female dummy in all regressions. We will discuss gender results in the next section.

4. Gender differences

The experimental literature on willingness to compete documents large and robust gender differences (see Croson and Gneezy, 2009, Niederle and Vesterlund, 2011, and Niederle, 2016, for surveys). In this section, we add to this literature by investigating whether the gender gap in choosing competition depends on the fairness of the competitive setting, and whether there are gender differences in the sabotage decision.

In Figure 4, we show the proportion of participants who choose competition in each of the six conditions separately by gender. We observe that the gender difference in willingness to compete also applies in a setting where the decision affects the opponent's payoff. 54 percent of men and 31 percent of women choose competition against a randomly chosen opponent on an even playing field (top left; $p<0.001$, Fisher's exact test), and 49 percent of men and 27 percent of women choose competition against an opponent of similar strength (bottom left; $p<0.001$). The latter observation is interesting in light of recent papers which conclude that the gender gap in willingness to compete can to a large part be explained by gender differences in beliefs about relative performance (van Veldhuizen, 2017; Gillen, Snowberg and Yariv, 2019) . In contrast, we find that even when the decision makers know that the opponent is of similar ability, men are still nearly twice as likely as women to choose competitive incentives.[10]

Our data therefore show a large gender gap in willingness to compete in the fair conditions. What happens to the gender gap when we consider the unfair conditions? Strikingly, we find that the gender gap is almost eliminated when the participants can choose to compete against a weaker opponent: 82 percent of men and 77 percent of women compete in this setting ($p=0.082$). Hence, it appears that selfish considerations trump fairness considerations both for women and men when deciding whether to enter a competition. With a sufficient unfair advantage, most women and men are willing to compete. In the other conditions, we observe a significant gender gap ($p<0.001$). Willingness to compete increases to a similar extent for men and women when we introduce a bonus, and reduces to a similar extent when we introduce an unfair disadvantage.

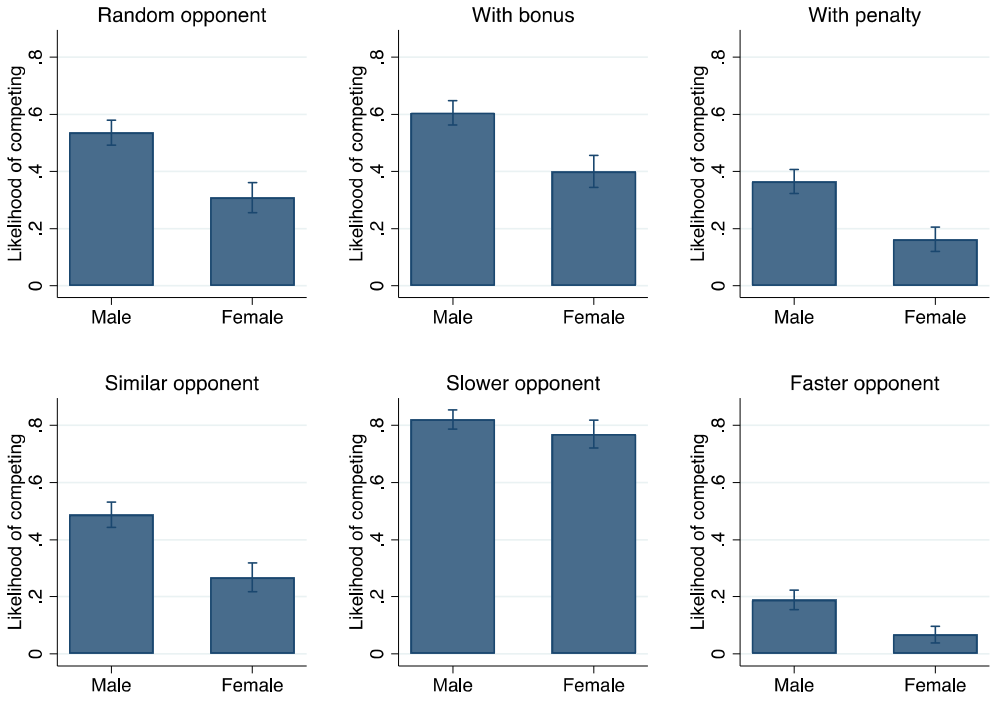
We can also examine whether there are gender differences when we classify participants into competition types. Table 2 shows the proportion of participants in each category separately by gender. Women are more likely than men to be selfish (77 versus 71 percent) or competition-averse (18 versus 14 percent) and less likely to be competitive (2 versus 13 percent). The distribution of individuals across type differs significantly between men and women ($p<0.001$; Fisher's exact test).

[10] Note that in this setting, there might still be a difference between men and women in the confidence they have in their ability to improve relative to the baseline round. Our data provide some rough evidence for this: when we include our confidence measure in a regression of the competition choice against a similar opponent on gender, the gender gap shrinks from 22 percentage points to 16 percentage points and the coefficient on the confidence variable is significant at $p<0.001$ (although, as expected, the relationship between confidence and choosing competition is weaker in this condition relative to the decision to compete against a random opponent).

Finally, when considering the sabotage decision, we observe that women are less willing than men to seize an unfair advantage when given the chance to do so: 55 percent of women and 66 percent of men choose the sabotage option (p=0.034; Fisher's exact test). Hence, fairness considerations appear to matter more for women than for men in the sabotage decision. In Table 3, we observe that this gender difference is robust to controlling for baseline performance and confidence.[11]

Result 4: *Women are less willing to compete than men under fair circumstances, but almost equally likely to compete when they know their opponent is weaker. Women are less willing than men to give themselves an unfair advantage by sabotaging their opponent's performance.*

Figure 4: Between-condition analysis by gender



Note: The graphs show the proportion of participants who choose competition in each condition by gender. Error bars show 95-percent confidence intervals obtained from regressions of a competition dummy on a gender dummy separately by decision scenario.

In Section A in the online appendix, we present some additional gender results from the within-subject experiment.[12] In Figure A1, we repeat the analysis in Figure 2, splitting the sample by gender. That is, we ask whether among participants who either compete (top

[11] We are not the first to document a gender difference in the willingness to sabotage the opponent in a competitive context. For example, Dato and Nieken (2014) find that men are more likely to choose costly sabotage in a real-effort competition experiment.

[12] In the online appendix, we provide further evidence of the robustness of the gender gap in competition from the between-subject experiment.

panel) or do not compete (bottom panel) in the fair conditions, men and women differ in their willingness to compete when they are at an unfair advantage or disadvantage. The top left panel shows competition rates for participants who compete against a randomly selected opponent on an even playing field. Women in this group show slightly more concern for fairness: 18 percent of women and 8 percent of men decide to not compete anymore when they receive an exogenous bonus (p=0.016; Fisher's exact test). The top right panel shows competition rates for participants who compete against a similar opponent. When faced with an opponent who is known to be weaker (top right panel), neither men nor women show much concern for fairness: 95 percent of men and 92 percent of women who choose competition when faced with an opponent of similar ability also choose competition when faced with a weaker opponent (p=0.418). The lower panel of Figure A1 shows choices for people who choose not to compete in the reference conditions. A similar proportion of men and women in this group are enticed to enter competition when given an unfair advantage.

Figure A1 in the online appendix also reveals an interesting incidental finding: compared with men, women who are willing to compete in the reference conditions are significantly more likely to refrain from competition when at a disadvantage. 60 percent of men, but only 40 percent of women, who choose competition on an even playing field still compete when handicapped by a 20-second penalty (p=0.001). Further, when faced with an opponent who is known to be stronger, 35 percent of men and 15 percent of women who compete against an equal opponent still compete (p=0.001).[13] This relates to Niederle and Yestrumskas (2008), who find a gender difference in seeking out challenging tasks.

To summarize, our results do not provide a clear answer to the question of whether women care more about fairness in competitive settings than men. Women are significantly less likely to sabotage, which suggests that they are more concerned with fairness. Among people who compete on an even playing field, women are also slightly more likely to stop competing when presented with an exogenous advantage. On the other hand, women are almost as likely as men to compete when they know the opponent is weaker, and consequently more likely to than men to compete against a weaker opponent but not against an equal (50 percent of women vs. 35 percent of men; p<0.001, Fisher's exact test). Women are also more likely than men to compete with a bonus but not on an even playing field (15 percent vs. 9 percent; p=0.014).[14]

5. Conclusions

We study how people trade off fairness and selfishness in competitive environments. We find that fairness concerns are dominated by selfish considerations for most individuals. The majority of participants are willing to compete when they have an unfair advantage and to sabotage a fair competition to gain an unfair advantage. We also show that the gender gap

[13] This is also the case for individuals with a high chance of winning. Among participants who compete in the standard condition and whose baseline time is ranked in the top 25 percent, 67 percent of men and 38 percent of women compete with a penalty (p=0.010). 40 percent of men and 11 percent of women who compete against an equal opponent also compete against a stronger opponent (p=0.027).

[14] Women are less likely than men to compete both with an advantage and a disadvantage (11 percent vs. 33 percent; p<0.001) and both against weaker and stronger opponents (6 percent vs. 18 percent; p<0.001).

in willingness to compete is almost fully removed when the participants are given the unfair advantage of facing an opponent they know to be weaker. In this case, a large majority of both men and women decide to compete. This suggests that concerns for competitors are not a key factor in preventing women from entering competitions. On the other hand, we note that women are less likely than men to sabotage their opponent in a competition when given the opportunity to do so.

The limited importance of fairness considerations for competitive decisions is best illustrated by studying the subsample of participants who choose competition on an even playing field or when faced with an opponent they know is of similar ability. Most of these individuals are also willing to impose competition on an opponent who has been exogenously handicapped or is known to be weaker. On the other hand, our results also demonstrate that a substantial minority cares about fairness in competition at least sometimes: many pass on a costless opportunity to increase their own chance of winning by sabotaging the performance of their opponent.

Knowing whether people who are attracted by competitive environments are more likely to engage in unfair or counterproductive behavior is important for managers. For instance, the selection effects of a competition-driven corporate culture and competitive incentive schemes depend on it. Our results are nuanced. We find that individuals who compete under fair circumstances are very likely to also compete under unfair circumstances and that participants who are willing to compete when at an unfair advantage – against a handicapped or weaker opponent – are also more likely to sabotage their opponent. This indicates that a competition-driven corporate environment could indeed disproportionally attract individuals who are willing to engage in unfair behavior, particularly if potential employees are under the impression that the competition is tilted in their favor.

However, we do not find that it is generally the case that competitive individuals care less about fairness. Participants who not only compete when they are at an advantage, but also when they face a stronger opponent or are themselves handicapped, are no more likely to engage in sabotage than are participants who never compete. This hints at two distinct types of competitive individuals: those who are driven by a desire to win and those who are driven by the joy or challenge of competing. Future research could study how these types of competitiveness correlate with other personality traits and social preferences and whether they play out differently in the labor market.

Our results are relevant for the design of selection, reward, and promotion schemes in organizations, as well as for assessing the effects of corporate culture. In summary, our findings suggest that rewarding employees through competitive means or fostering a competitive work environment might not only encourage unfair and counterproductive behavior from many individuals, but also attract individuals who are more willing to engage in unfair acts, especially if the competitive setting is perceived to be tilted in favor of a particular individual or group.

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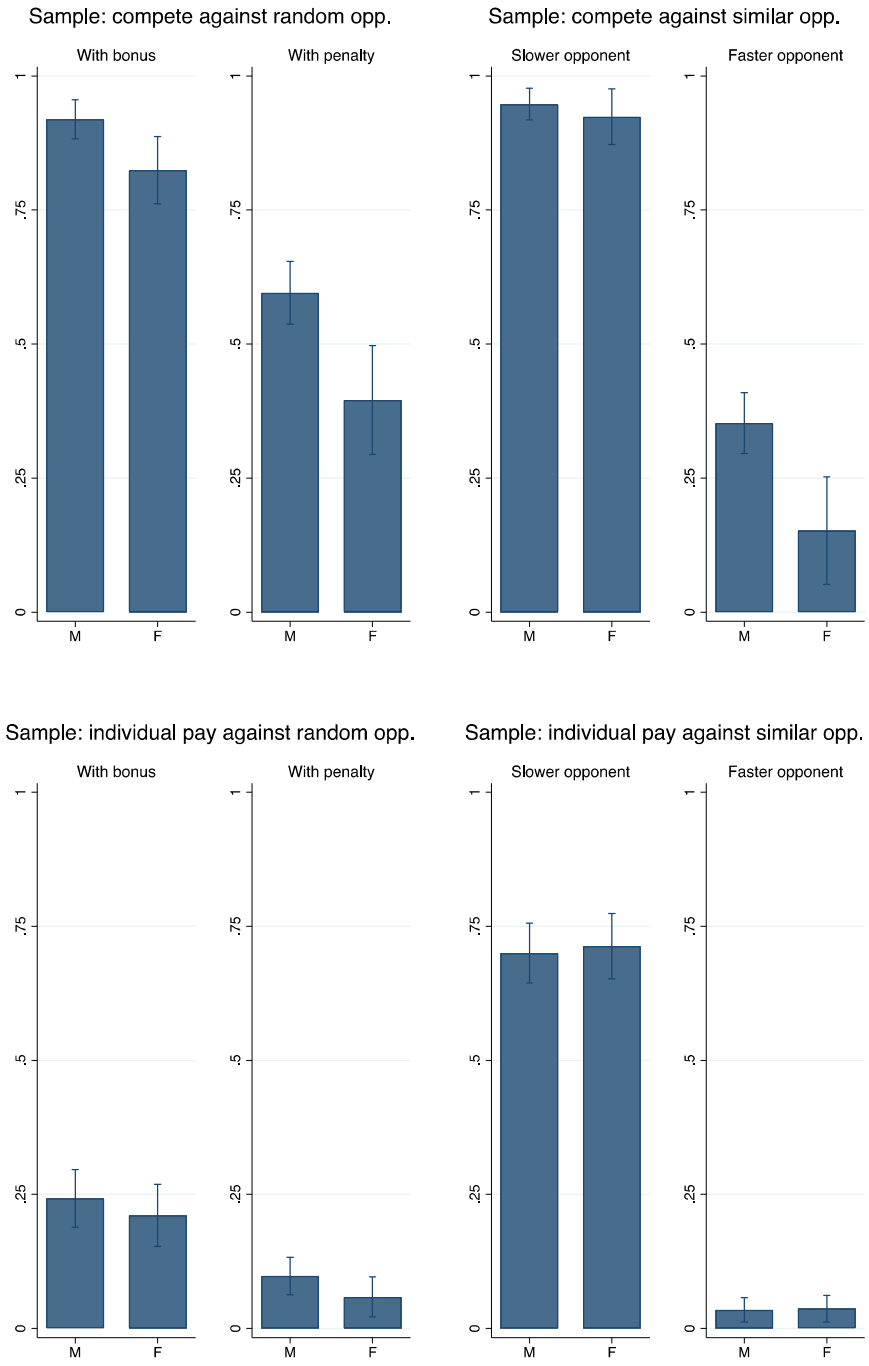
Online Appendix

Section A: Additional gender analyses

Figure A1: Proportion choosing to initiate competition in each condition split by gender and the choice in the reference decisions (against a randomly selected opponent and a similar opponent)



Note: Error bars show 95-percent confidence intervals obtained from regressions of a competition dummy on gender in each condition.

Section B: Between-subject experiment

Design and procedures

In a separate between-subject experiment with the same participants, we directly compare average competition entry rates and the gender gap in choosing to compete in the standard individual setting and in a setting where winning the competition means an opponent loses. We also study whether this effect differs according to whether the potential opponent was forced into competition or chose to enter voluntarily.

Participants were randomly allocated to one of four treatment groups or a comparison group. In each treatment, participants have to decide between individual incentives and first-past-the-post competition with the same incentives as in the within-subject experiment. Participants in the comparison group do not make any decision and are simply informed that they will be competing against another participant. In the *Baseline* treatment, which is closest to the design of Niederle and Vesterlund (2007), participants who choose to compete, have their performance compared with the performance of a randomly selected comparison group participant (who is competing against someone else). The competition choice and performance therefore have no impact on the payoff of the opponent or anyone else. In the *Selection* treatment, participants who choose to compete have their performance compared with the performance of another participant and, also in this treatment, the competition choice and performance do not impact the payoff of the other participant. However, in this treatment, the performance is compared with the performance of a participant who also choses to compete. In the *Losers* treatment, participants who choose to compete directly compete against a random participant from the comparison group whose payoff depends on whether they win or lose. Comparison group participants have no choice whether to compete and there is consequently no selection. In the final *Selection and Losers* treatment, we combine selection and creating losers by having participants directly compete against another participant from the same treatment who also choses competition. Table 2 shows the number of observations in each treatment by gender. No feedback was given on the outcome of the competition during the experiment.

Table A1: Number of observations by treatment and gender in the between-subject experiment

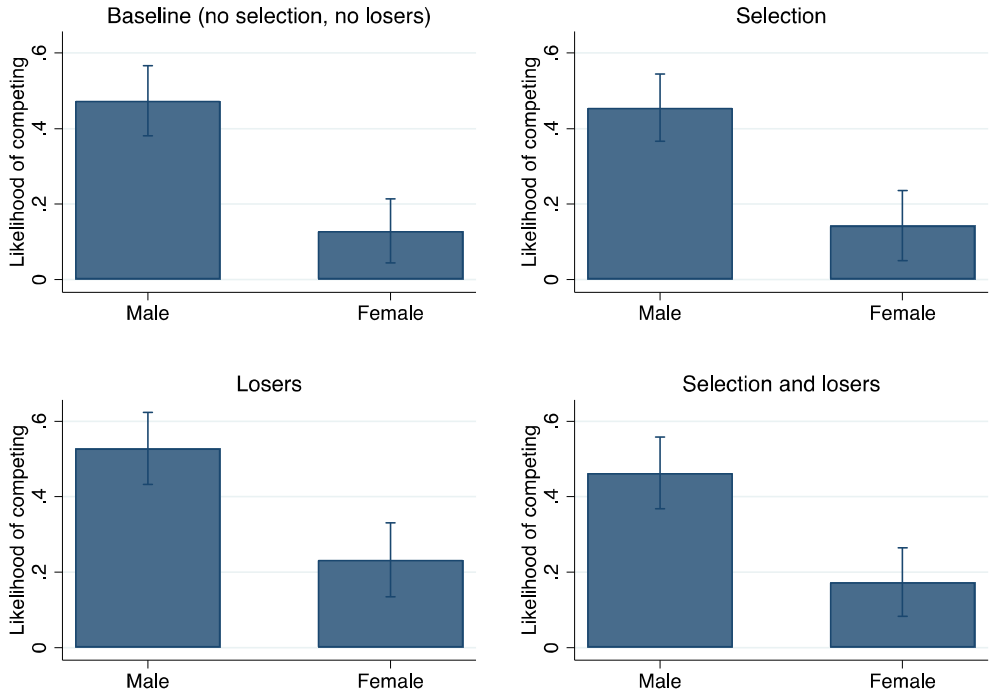
Treatment	N male	N female	N
No selection, no losers (baseline)	114	62	176
Selection	123	56	179
Losers	108	73	181
Selection and losers	108	69	177
Comparison group	54	35	89
Total	507	295	802

Results

We will now discuss the results from the between-subject experiment. Here we are interested in determining whether the proportion of participants who choose competition (and the gender difference therein) differs between the standard lab design (Niederle and Vesterlund 2007), where the decision to compete is purely individual and a design where winning the competition negatively affects another person's payoff.

The results are presented in Figure A2 and Table A2. The main conclusion is that, on average, decisions are not affected by whether winning the competition creates a loser, neither when the opponent is forced to compete nor when the opponent self-selected into competition. If anything, competition rates are slightly higher when there is a real loser. Neither do we find that people care more about making someone else lose when that person had no choice whether to compete. Again, the effect is small and goes in the opposite direction.

Figure A2: Competition entry rates by gender and treatment



Note: Error bars show 95-percent robust confidence intervals obtained from regressions of a competition dummy on gender within each treatment.

Results are very similar for men and women, such that the gender gap in competing does not vary significantly across treatments. In the Baseline treatment, women are 34 percentage points less likely to compete. In the Losers treatment, the difference is 29 percent (p=0.623). In the Selection treatment, women are 31 percentage points less likely to compete, while in the Selection and Losers treatment, the difference is 29 percent (p= 0.819).[15]

Although this is not our main focus, it is also interesting to briefly comment on the direct effect of facing a self-selected opponent (versus facing a randomly selected opponent). Neither men nor women change their willingness to compete according to whether opponents are randomly chosen or self-selected. This is surprising in the sense that self-selected opponents can be expected to be stronger than randomly selected opponents. The magnitude of this effect depends on how strongly competitors select on actual performance. The performance of the average self-selected competitor in the Selection treatments is at the 57th percentile, which is higher than 50 but still far from perfect sorting on performance.

These results are good news for the external validity of the literature on gender differences in competitiveness and the literature linking competitiveness to career outcomes. Competition decisions – and the gender gap in choosing competition – elicited with the standard method in a choice environment that eliminates social concerns are very similar to those elicited in a richer, more realistic environment. The result that competition rates and the gender difference therein do not react to whether winning the competition has a direct negative impact on the opponent, even if that opponent had no choice but to compete, also underlines the results from the within-subject experiment. When deciding whether to compete, expected payoff and not social concerns are the determining factor.

Table A2: Effect of between-subject treatments on choosing competition

	(1)	(2)	(3)	(4)	(5) Female:	(6) Female:	(7) Male:	(8) Male:
Selection	-0.035	-0.007	-0.026	-0.035	-0.026	0.014	-0.041	-0.018
	(0.034)	(0.048)	(0.031)	(0.043)	(0.047)	(0.064)	(0.047)	(0.065)
Losers	0.045	0.072	0.044	0.035	0.069	0.104	0.030	0.054
	(0.034)	(0.049)	(0.031)	(0.043)	(0.047)	(0.066)	(0.047)	(0.067)
Sel*Los		-0.056		0.018		-0.073		-0.046
		(0.069)		(0.062)		(0.093)		(0.094)
Female	-0.310***	-0.310***	-0.171***	-0.171***				
	(0.033)	(0.033)	(0.033)	(0.033)				
N	713	713	711	711	260	260	453	453

Note: The coefficients are from OLS regressions with a dummy for choosing competition as the dependent variable. Robust standard errors in parentheses; *p<0.1, **p<0.05, ***p<0.001.

[15] P-values in the paragraph are from OLS regressions of a competition dummy on a gender dummy, a treatment dummy and the interaction of the two.

Welcome to this experiment. In this experiment, you will be paid for your performance in a simple numerical task. The task consists in solving 10 sums like the ones below. The experiment has three rounds and the task is the same in each round. One of the three rounds will be randomly chosen for your payment. After the experiment, we will ask you to fill in a short questionnaire.

All your choices and answers and your performance will be recorded anonymously. At the end of the experiment, you will receive a randomly generated number which you need to write down. You will need this number to retrieve your payment.

To practice, please solve the sums below. Once you have solved them correctly, you can continue to the next screen where you will receive further instructions about the first round of the experiment.

40 + 78 + 24 + 55 = ?

88 + 37 + 49 + 75 = ?

Before you perform the task, you can choose how you would like to be paid for your performance in the first round. You have two options:

1. **Individual pay**: you receive 100 NOK for correctly completing the 10 sums.
2. **Competition**: your performance will be compared to the performance of another student who is participating in this experiment. If you correctly solve the 10 sums faster than that other student, you earn 200 NOK, if you are slower, you earn nothing. Whether you win or lose has no influence on the payment of the other student. The other student is part of a randomly chosen group who are also choosing between individual pay and competition: if they choose individual pay, they receive 100 NOK for completing the task, and if they choose competition, they compete against another student's performance (not yours). The student you are compared with is randomly chosen amongst the students who choose competition in this group.

You will receive feedback on the task when you receive your payment.

- ○ Individual pay
- ○ Competition

→

NHH

Before you perform the task, you can choose how you would like to be paid for your performance in the first round. You have two options:

1. **Individual pay**: you receive 100 NOK for correctly completing the 10 sums.
2. **Competition**: your performance will be compared to the performance of another student who is participating in this experiment. If you correctly solve the 10 sums faster than that other student, you earn 200 NOK, if you are slower, you earn nothing. Whether you win or lose has no influence on the payment of the other student. The other student is part of a randomly chosen group who are not asked to make a choice about how to get paid. They have to compete against each other. The student you are compared with is randomly chosen amongst the students in that group.

You will receive feedback on the task when you receive your payment.

- ○ Individual pay
- ○ Competition

→

NHH

Before you perform the task, you can choose how you would like to be paid for your performance in the first round. You have two options:

1. **Individual pay**: you receive 100 NOK for correctly completing the 10 sums.
2. **Competition**: your performance will be compared to the performance of another student in this session who was asked to make the same choice as you and also chose to compete. If you correctly solve the 10 sums faster than that other student, you earn 200 NOK and the other student earns nothing. If you are slower, you earn nothing and the other student earns 200 NOK.

You will receive feedback on the task when you receive your payment.

- ○ Individual pay
- ○ Competition

→

NHH

Before you perform the task, you can choose how you would like to be paid for your performance in the first round. You have two options:

1. **Individual pay**: you receive 100 NOK for correctly completing the 10 sums.
2. **Competition**: your performance will be compared to the performance of another student who participates in this session. If you correctly solve the 10 sums faster than that other student, you earn 200 NOK and the other student earns nothing. If you are slower, you earn nothing and the other student earns 200 NOK. The other student is part of a randomly chosen group who are not asked to make a choice about how to get paid, but has to compete. If you choose not to compete, he or she will have to compete against somebody else from that group.

You will receive feedback on the task when you receive your payment.

- ○ Individual pay
- ○ Competition

→

NHH

In the first round, your performance will be compared to the performance of another student in this session. If you correctly solve the 10 sums faster than that other student, you earn 200 NOK and the other student earns nothing. If you are slower, you earn nothing and the other student earns 200 NOK. You will receive feedback on the task when you receive your payment.

→

As soon as you click, the task will start.

→

NHH

Solve the following 10 sums as fast as possible. You can only proceed to the next screen when all sums are solved correctly.

83 + 31 + 20 + 64 = ?

90 + 25 + 37 + 64 = ?

81 + 33 + 79 + 26 = ?

NHH

This is the second round of the experiment. In this round, your performance will be compared to the performance of another student. If you correctly solve the 10 sums faster than that other student, you earn 200 NOK, if you are slower, you earn nothing. Whether you win or lose has no influence on the payment of the other student (the other student's performance will be compared against someone else's performance).

As soon as you click, the task will start.

→

NHH

Solve the following 10 sums as fast as possible. You can only proceed to the next screen when all sums are solved correctly.

20 + 27 + 50 + 49 = ?

81 + 54 + 62 + 53 = ?

53 + 56 + 75 + 81 = ?

NHH

This is the third round of the experiment. You will again perform the same task. You are paired with another randomly selected student in this session. We will ask you to make a series of choices about how to be paid. We will randomly select one of your choices or one of the choices of the student you are paired with and implement that choice.

Choice 1:

1. **Individual pay**: You receive 100 NOK for correctly completing the 10 sums. The other student also receives 100 NOK for correctly completing the 10 sums.
2. **Competition**: If you correctly solve the 10 sums faster than the other student, you earn 200 NOK and the other student earns nothing. If you are slower, you earn nothing and the other student earns 200 NOK.

- ○ Individual pay
- ○ Competition

→

NHH

This is the third round of the experiment. You will again perform the same task. You are paired with another randomly selected student in this session. We will ask you to make a series of choices about how to be paid. We will randomly select one of your choices or one of the choices of the student you are paired with and implement that choice.

Choice 2:

1. **Individual pay**: You receive 100 NOK for correctly completing the 10 sums. The other student also receives 100 NOK for correctly completing the 10 sums.
2. **Competition**: If you correctly solve the 10 sums faster than the other student, you earn 200 NOK and the other student earns nothing. If you are slower, you earn nothing and the other student earns 200 NOK. You receive a bonus of 20 seconds (that is, 20 seconds will be deducted from your time). The other student does not receive a bonus.

- ○ Individual pay
- ○ Competition

→

NHH

This is the third round of the experiment. You will again perform the same task. You are paired with another randomly selected student in this session. We will ask you to make a series of choices about how to be paid. We will randomly select one of your choices or one of the choices of the student you are paired with and implement that choice.

Choice 3:

1. **Individual pay**: You receive 100 NOK for correctly completing the 10 sums. The other student also receives 100 NOK for correctly completing the 10 sums.

2. **Competition**: If you correctly solve the 10 sums faster than the other student, you earn 200 NOK and the other student earns nothing. If you are slower, you earn nothing and the other student earns 200 NOK. The other student receives a bonus of 20 seconds (that is, 20 seconds will be deducted from his or her time). You do not receive a bonus.

- ○ Individual pay
- ○ Competition

→

NHH

This is the third round of the experiment. You will again perform the same task. You are paired with another randomly selected student in this session. We will ask you to make a series of choices about how to be paid. We will randomly select one of your choices or one of the choices of the student you are paired with and implement that choice.

Choice 4:

1. **Individual pay**: You receive 100 NOK for correctly completing the 10 sums. The other student also receives 100 NOK for correctly completing the 10 sums.
2. **Competition**: If you correctly solve the 10 sums faster than the other student, you earn 200 NOK and the other student earns nothing. If you are slower, you earn nothing and the other student earns 200 NOK.

What is your choice under each of the following scenarios?

What is your choice in case the other student was more than 20 seconds slower than you in solving the task in round 2.

- Individual pay
- Competition

What is your choice in case the other student's time in round 2 was similar to yours (within plus/minus 20 seconds).

- Individual pay
- Competition

What is your choice in case the other student was more than 20 seconds faster than you in solving the task in round 2.

- Individual pay
- Competition

→

NHH

This is the third round of the experiment. You will again perform the same task. You are paired with another randomly selected student in this session. We will ask you to make a series of choices about how to be paid. We will randomly select one of your choices or one of the choices of the student you are paired with and implement that choice.

Choice 7:

If this choice is implemented, you will be paid according to **Competition** pay: if you correctly solve the 10 sums faster than the other student, you earn 200 NOK and the other student earns nothing; if you are slower, you earn nothing and the other student earns 200 NOK.

However, you can choose whether you want to give yourself an advantage by imposing a penalty of 20 seconds on the other student whom you are competing against (that is, 20 seconds will be added to the time the other student takes to finish the sums).

- ○ Impose 20-second penalty on other student
- ○ Do not impose 20-second penalty on other student

→

NHH

After the experiment, we will randomly pick one of your decisions or one of the decisions of the other student and implement that decision. This means that you may either be paid according to Individual Pay or according to Competition but you will not know until you receive your payment.

As soon as you click, the task will start.

→

NHH

Solve the following 10 sums as fast as possible. You can only proceed to the next screen when all sums are solved correctly.

13 + 95 + 99 + 94 = ?

88 + 39 + 30 + 79 = ?

96 + 87 + 71 + 57 = ?

NHH

This is the end of the experiment. We will now ask you to fill in a brief questionnaire.

What is your gender?

- Male
- Female

What is your age?

How competitive do you consider yourself to be? Please choose a value on the scale below, where the value 0 means 'not competitive at all' and the value 10 means 'very competitive'.

0	1	2	3	4	5	6	7	8	9	10
○	○	○	○	○	○	○	○	○	○	○

How do you see yourself: are you generally a person who is fully prepared to take risks or do you try to avoid taking risks? Please choose a value on the scale below, where the value 0 means 'not at all willing to take risks' and the value 10 means 'very willing to take risks'.

0	1	2	3	4	5	6	7	8	9	10
○	○	○	○	○	○	○	○	○	○	○

How fast do you think you performed (on average) in the tasks compared to the other students who participated?

Slowest 10%	2	3	4	5	6	7	8	9	Fastest 10%
○	○	○	○	○	○	○	○	○	○

→

NHH

This is the end of the experiment. You will receive your payment during a future lecture. The experiment is anonymous and you will need your random payment number below to receive your payment. Please write down this number now and make sure you keep it until you received your payment.

Your random payment number is **6240169**

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NHH

We thank you for your time spent taking this survey.
Your response has been recorded.

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