Are there Gender Differences in Status-Ranking Aversion?

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Abstract

Competition involves two dimensions, rivalry for resources and social-status ranking. In our experiment we exclude the first dimension and investigate gender differences in the preference for status ranking. Participants perform a task under non-rivalry incentives. Before doing so, individuals indicate whether they prefer to do the task in an environment with social-status ranking or one without, knowing whether or not the choice will be imposed upon the whole group (as opposed to being personal) and whether the ranking will be observed by a man or a woman. We find no gender difference in mean status-ranking aversion when the ranking is personal. When the ranking is imposed, there are still no gender differences in the preferences for social ranking when the rank observer is a woman, and women are not affected by the rank observer's gender. With a male rank observer, however, men have a much stronger desire to be ranked than with a female rank observer.

Keywords: status ranking, competition, gender
JEL codes: C91, J16

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1. Introduction

The most prominent aspect of competition is perhaps the rivalry for resources as described in Stigler (1987). The way rivalry for resources has distinct effects on men and women has been studied in detail in a very large theoretical and empirical literature. Niederle (2016) presents a recent survey of relevant studies, distinguishing between those that deal with gender differences in performance under competitive incentives and those that analyze gender differences in choices between competitive and non-competitive incentive schemes. With respect to the former, the seminal paper is Gneezy et al. (2003). Their main finding is that in single-sex tournaments the fraction of women among top performers is not different from that of men, whereas mixed-sex competition results in a decrease in the fraction of women among top performers. As for choices between incentive schemes, there is now ample evidence that women tend to avoid having to perform in environments involving rivalry for resources. Here, the seminal study is Niederle and Vesterlund (2007), who find that when given the option of performing a real-effort task under a piece-rate or a competitive payment scheme, women chose the piece rate more often than men. This intriguing result has by now been replicated many times[1] and has given rise to the phrase 'women shy away from competition' (see also Brandts et al. 2015).

A second dimension of competition, which has received less scholarly attention, is the generation of a social-status ranking. In many settings competition leads to a ranking of relative performance; high-ranking performance and winning a competition often go hand in hand. If such a performance ranking is socially recognized then it leads to a social-status ranking, as defined by Ball et al. (2001). In the Niederle and Vesterlund (2007) experiments, participants may perceive a status-ranking dimension of the competition, but it is not salient compared to the rivalry-for-resources dimension.

Given these two important dimensions of competition, it is natural to ask whether the gender differences reported in the literature for environments where the rivalry dimension is obvious (like competition for a monetary prize) are also observed in situations where social-status ranking is more important (like competition for a prestigious academic title). If this is not the case, then one might seriously question the

[1] Niederle (2015) lists a total of fifteen papers replicating the result based on the same design and another twelve papers using different designs, with only two papers not replicating it. Dariel et al. (2017) contains a list of papers using the design.

generalizability of the 'rivalry result' to situations in the world outside the laboratory where both dimensions of competition are important.

Although rivalry for resources and social-status ranking are two separate dimensions of a single phenomenon, competition, it is not *a-priori* obvious that differences between women and men's attitudes toward one dimension should carry over to the other. In Schram et al. (2019) –henceforth, SBG19–, we show that the gender differences in performance under rivalry for resources are indeed also observed when there is only social-status ranking. In the present paper we address the second main result of the gender and rivalry literature. We study whether the phenomenon of women shying away from competition arises in an environment with status ranking, but without rivalry for resources. This is our main research question. We examine this question in the laboratory, using an experimental design that isolates the status-ranking dimension of competition.

The focus here is on examining what kind of environment –with status ranking or without– participants choose. Our experimental set-up involves a specially designed way of creating status ranking; it focuses participants' attention on the social recognition of the rank by making it salient –in the sense of easily perceivable– and tangible to them. Status ranking does not stem from simply receiving feedback about relative position; it is the recognition of one's ranking by others that creates a social status (Ball et al. 2001). Salient sociality is therefore an important dimension of status ranking. We achieve this by having participants report their relative performance in a task to a rank observer that can compare this performance to that of others. More details on the implementation of this environment is provided in the experimental design section, below.

To investigate whether the 'shying away from rivalry' result carries over to the social-status ranking of competition, we study whether people prefer to report their relative rank to a shared rank observer or rather report their absolute score to a personal observer who cannot make a comparison to others (that is, without status ranking). It is important to note that the experimental setup used to study shying away from rivalry for resources does not have a direct parallel in this social-status environment. In the rivalry experiments of Niederle and Vesterlund (2007), participants choose to either receive a piece rate remuneration or to compete for a prize. In the latter case, they compete with the performance of others in a previous round. One cannot implement social ranking vis-à-vis others' performance in a previous round, however, because this

would involve those others reporting their previous performance and therefore ex post being subjected to social ranking, possibly against their will.[2]

The rivalry setup with a competition based on the previous round is characterized by two important features: (i) a choice to compete is not imposed on others and (ii) participants know precisely with how many others they will be competing. A priori, it is unclear if either of these is or both are important drivers of the 'shying-away effect'. Because we cannot simultaneously implement both features when studying social-status ranking, we instead compare a treatment where one's decision on whom to report to is imposed on others and the size of the comparison group is known [satisfying (ii) but not (i)], to one where the decision is not imposed but the size is determined endogenously and therefore remains unknown to participants [satisfying (i) but not (ii)]. Arguably, in the latter case the a-priori unknown size of the comparison group makes social-status ranking less salient.[3]

There is another feature of the circumstances surrounding the choice situation that might be more important for status ranking than for rivalry. This is the gender of the person observing the ranking. In the studies where subjects choose whether or not to enter rivalry for resources (Niederle and Vesterlund 2007), by design they do not have to do this vis-à-vis a particular person and, hence, gender is irrelevant in this case.[4] In the status comparison it might be important, however, because the gender of the rank observer to which one reports is obviously salient. We investigate the importance of the rank observer's gender in our data analysis.

We find remarkable results. In the treatment where the choice is not imposed on others we find no differences between men and women in choosing between an environment with social-status ranking and one without. This might be because, as mentioned above, status ranking is less salient when the size of the comparison group is a priori unknown. In the treatment where the choice is imposed, the effects depend on the gender of the rank observer. With a female rank observer, we still observe no significant gender differences in the choice of environment. In contrast, a large gender difference occurs with a male rank observer. In this case, the chance that a woman

[2] In contrast, an ex-post comparison to others in the rivalry case (Niederle and Vesterlund 2007) has no consequences for those others.

[3] Of course, in the case where a decision is imposed on others, some might be forced into an environment of status ranking against their will. As we will explain below, all participants know before they do any task whether or not this will be the case.

[4] To the best of our knowledge, Datta Gupta et al. (2013) is the only study in the 'shying-away' literature that looks at gender effects when the group's gender composition is known.

chooses status ranking is significantly and substantially lower than that of men. When the ranking is observed by a male and is imposed on all, 70% of the men choose to be ranked as opposed to only 33% with a female rank observer. Women choose to be ranked 45% and 33%, respectively, with a male or female rank observer.

We conclude that when a man observes the ranking, a gender difference in preferences for status ranking appears that is reminiscent of the result for rivalry for resources, albeit only when the ranking is imposed on others, making the size of the comparison group a priori known. We find no gender difference in status-ranking aversion when the rank observer is a woman. Moreover, when the ranking is observed by a man, women's preference for status ranking is more or less the same as with a female rank observer, whereas that of men increases. As a consequence, with a male rank observer, women's preference for status ranking is lower than that of men.

Together, these results suggest that the preferences of male and female decision-makers for entering competitive environments may depend on two circumstances surrounding the decision-making process. First, the gender of those organizing, supervising and witnessing the competition is important. This may also hold for the case where competition consists in the rivalry for resources, but at this point no evidence exists on this matter. Second, it matters whether the choice of a competitive environment is imposed on others or holds only for one personally. This result is important, because the choice of imposing certain decisions on others is often at the discretion of policy makers.

The remainder of this paper is organized as follows. The following section presents our experimental design and procedures. Section 3 gives our results and is followed by a concluding discussion in Section 4.

2. Experimental Design and Hypotheses

The experiment was conducted in May 2016 at the laboratory of the Universitat Pompeu Fabra (UPF) in Barcelona. There were 18 sessions with 13 participants each, for a total of 234 participants. As explained below, 126 of these participants played a passive role. Our analysis of the data is therefore based on the decisions of 108 individuals. Participants were mainly undergraduate students who were recruited on a

voluntary basis from the UPF subject pool using the ORSEE recruitment software (Greiner 2004).[5]

The experiment was partly computerized, using experimental software that was developed in Delphi at the Center for Research in Experimental Economics and political Decision making (CREED) by Jos Theelen.[6] Instructions were handed out on paper and can be found in Appendix A.

Sessions lasted approximately 40 minutes. Participants were paid their earnings, in private, at the end of each session. For the 108 students we base our analysis on, average earnings were €17.16 (including the €5 show-up fee). Passive participants received a €20 flat fee each.

Experimental Design

Upon arrival, participants are randomly allocated to two types of players, denoted by A and C respectively.[7] Only A players enter the laboratory and do the tasks described below. C players are taken to separate rooms and have a passive role throughout the experiment. In every session there are six A players and seven C players. The experiment consists of four parts.

Part 1

In part 1 (not computerized), A players are informed via the read-aloud instructions (see Appendix A) that they will be asked to perform an individual real-effort task (described in part 3 below). A players are also told before the task that they will be required to report their performance to one of their peers (a C player) after task completion. There are two types of C players (observers). First, each A player is assigned a 'Personal C player' shared with no other participant. Second, there is a 'Shared C player' that all A players (might) report to. The A-player instructions emphasize the importance of doing well in the real-effort task by mentioning that it has

[5] In case of more volunteers than needed for the session, a random selection took place and the remainder of participants was sent off with a €5 show-up fee. Of the 108 active participants, 53 were majoring in economics or business, the others were from a large variety of disciplines. 55 of the participants were female. Age varied between 18 and 31, with an average of 20.6.

[6] The software is available from the authors upon request.

[7] In SBG19, there are also 'B-players', who did not report their performance to anyone. Though they are not included in the current experiment, we maintain the labels for the A and C players for reasons of cross-paper consistency.

been shown to correlate positively with success in professional life.[8] After finishing reading the instructions, each A player is individually taken to their Personal C player and to the Shared C player and reads aloud a text stating that (s)he might return after the task to report her or his performance on the task. When the A players are taken for the first time to meet their Personal and Shared C players they naturally take notice of their gender.[9] This way of introducing C's gender allows us to assess whether it interacts with the main research question of whether gender differences exist in wanting to perform under conditions in which there is social-status ranking.

A players need to visit both C players in their respective rooms because at this stage, they do not yet know which of the two they will visit in the end. Aside from introducing the C's genders, these visits are also done to create the anticipation of having to later report to a C player. Note that the distinction between the two types of C players captures two distinct environments that a participant can be placed in. The environment where everyone reports to the Shared C player allows for social-status ranking, since the C player is informed by all A players about their relative score (their absolute score and how this ranks among the six A players in the session). The Shared C player is the one we refer to as the 'rank observer'. By contrast, in the environment where A players report to distinct Personal C players no ranking across A players is possible. Here, the A players only report their absolute score. In this way, the Personal C player is an observer of the score, but not of the rank. We will therefore sometimes refer to the Personal C player as the 'score observer'. The fact that the interaction between A and C players is face-to-face is an important feature of our design. The very definition of social status requires public recognition of the ranking (Ball et al. 2001). Personally reporting the relative rank to a peer combined with the knowledge that this peer also directly hears the others' performance is a straightforward way to make public recognition salient (and credible) to participants. Though there may be other ways of making the publicness salient, we believe ours to be an obvious first step that may

[8] Participants were informed that we would provide evidence of this claim after the experiment if so desired. For this purpose, we had copies of Koedel and Tyhurst (2012), which links math skills to labor market outcomes.

[9] Exactly half of the Shared C players were female. 56% of the Personal C players were female. The experimenters taking the A players to see the C players alternated between a man and a woman.

magnify the impact of the status ranking.[10] More details on the novelty of this design feature can be found in SBG19.[11]

Part 2

In part 2 (not computerized), the A players are asked to choose to which C player (their Personal C player or the Shared C player) they would like to report their performance. The way they report their performance, depends on the choice they make. A players who choose their Personal C player are told (by the experimenter) their own absolute score and their ranking compared to other A players, but are told to report only their absolute score to the chosen C player. A players who choose the Shared C player are told their score and their ranking, and are told to report the absolute score and how it ranks relative to the others.[12] Note that this creates two distinct consequences of choosing the Personal or Shared C players. First, the Shared C player potentially sees multiple A players whereas the Personal C only sees the subject concerned. Second, the Shared C is told the subject's rank (which he or she can also infer by comparing the absolute scores reported by the A's that visit him or her), while the Personal C is not. Both represent dimensions of the status ranking that takes place when the Shared C is chosen but not with the Personal C. Our research question addresses this status ranking per se; at this stage, we are not interested in which of these two consequences is driving the subject's choice.

C players are not provided with any information about the task A players are doing, but are informed that high scores indicate better performance than low scores. This is known to the A players. The implications of the choice of a Shared or a Personal

[10] A possible control treatment would be to make the gender of the C-players not visible. At this stage of the research, however, we feel that this would reduce the salience of the sociality of status ranking too much. Also, note that every participant must report face-to-face to a C player. Gender differences in how comfortable male and female participants feel about having to reveal their score in person will therefore not play a role.

[11] Aside from this design feature and the real-effort task used (see below), the two studies address two very different research questions, which are both derived from the literature on rivalry for resources as introduced above. In SBG19, the two types of C player were varied between sessions and imposed on participants. There we asked how the type of observer affects performance. Here, in contrast, we let the participants choose the type of observer they want to report to. This choice is the key variable we are interested in. No subject participated in both experiments.

[12] The own score and ranking are truthfully reported by reading out loud a form provided by the experimenters (cf. Appendix A). Although the possibility of misreporting cannot be ruled out –the experimenters who accompany the A players to see the C player never enter the room where the C player is sitting– we have no indication of misreporting. Note that the act of misreporting in itself is of little relevance to our main research interest, as we are interested in the effect of anticipating performance ranking on choices made.

C player depend on our treatment variable.[13] As mentioned in the introduction, we distinguish between cases where a subject's choice is imposed only on herself or himself and cases where it is imposed on all. In the former, which we call *Own Choice (OC)*, some A players may choose to report their performance to the Shared C player, while others each report to their own Personal C player. This treatment allows us to collect data about gender differences in preferences for either type of environment (status-ranking vs. no status-ranking).[14] We call the alternative to OC the *Imposed Choice (IC)* treatment. Here, also, each A player chooses a Personal or a Shared C player. One A player is then randomly selected and his or her choice is implemented for all. The participants are informed, before making their choices, about this random dictator mechanism.[15]

As argued above, the gender of the C player may be important for the A player's choice. In particular, the gender of the Shared C player might matter, because this is the one that observes a social-status ranking. Table 1 provides the numbers of observations for *OC* and *IC* and indicates the gender division of the shared C players.

Table 1: Treatments and observations

		Gender of Shared C*	
		Male	Female
Implication of choice	Own Choice (*OC*) (choice holds only for self)	4 sessions 24 A players	4 sessions 24 A players
	Imposed Choice (*IC*) (if selected, choice holds for all A players)	5 sessions 30 A players	5 sessions 30 A players

*Roles (A or C) in the experiment were randomly allocated. It is therefore a coincidence that the number of male and female Shared C's is equal, both for *OC* and *IC*.

[13]As a robustness check, we also included sessions where participants could change the choice of C player after completion of the task. The results show that this has no significant effect on choices. More information is available upon request.

[14] There are examples of this kind of choices in the field. In many organizations, for example, employees can opt between, on the one hand, keeping a low profile and, on the other hand, going for a fast-track involving promotion tournaments where one is compared to others.

[15] Recall from the discussion above that the distinction made between *OC* and *IC* allows us to capture in these two treatments, two characteristics of the rivalry-for-resources literature. These are that choices are not imposed and that the group size is a priori known. Imposing a choice is one way to keep the group size of those effectively competing constant. There could be gender differences in the effects of having one's decision imposed on others. The comprehensive review of gender effects by Niederle (2016) does, however, not document any such differences. Moreover, if such effects were to be dominant in our data, one would expect to observe gender differences in the chosen C player irrespective of the C player's gender. We will see below that this is not what we find.

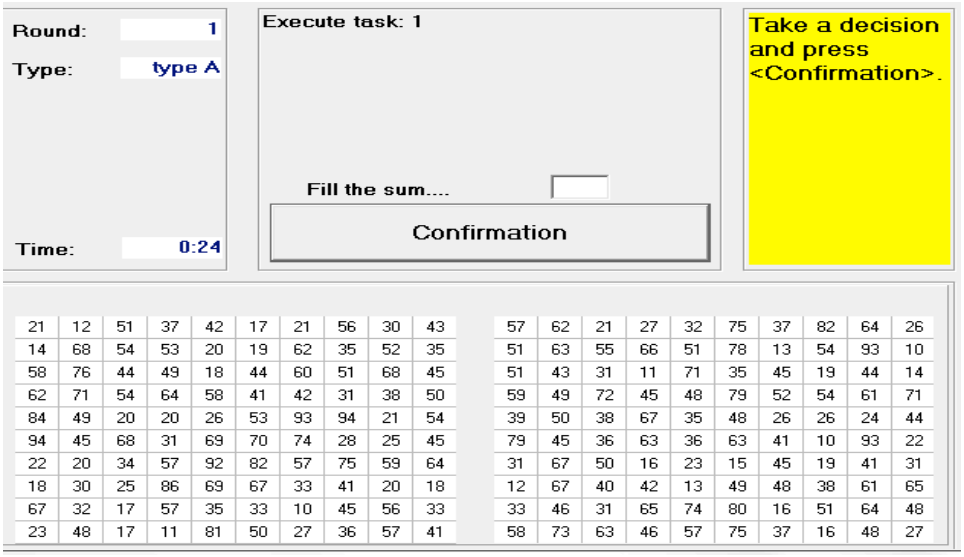
Note that in this experiment, there is no interaction between A players, so each A player provides one independent observation.

Part 3

In part 3 of the experiment (which is computerized), A players undertake an individual real-effort task. This consists of a summation of two-digit numbers that must first be found in two 10x10 matrices (for more details, see Weber and Schram 2017). These matrices appear at the bottom half of their computer monitor (Screenshot 1).

For each pair of matrices, each participant has to find the highest number in the left matrix and the highest number in the right matrix. Then, (s)he must calculate the sum of the two numbers. This sum must then be entered at the top-center part of the monitor (Screenshot 1). Each correct answer is rewarded with one euro. Note that this piece-rate remuneration (applied in all treatments) means that there is no rivalry for resources in this task. After a number has been entered, two new matrices appear, regardless of whether or not the sum was correct. We measure performance by the number of correct summations. The task continues for 15 minutes.

Screenshot 1: Screenshot Part 3[16]



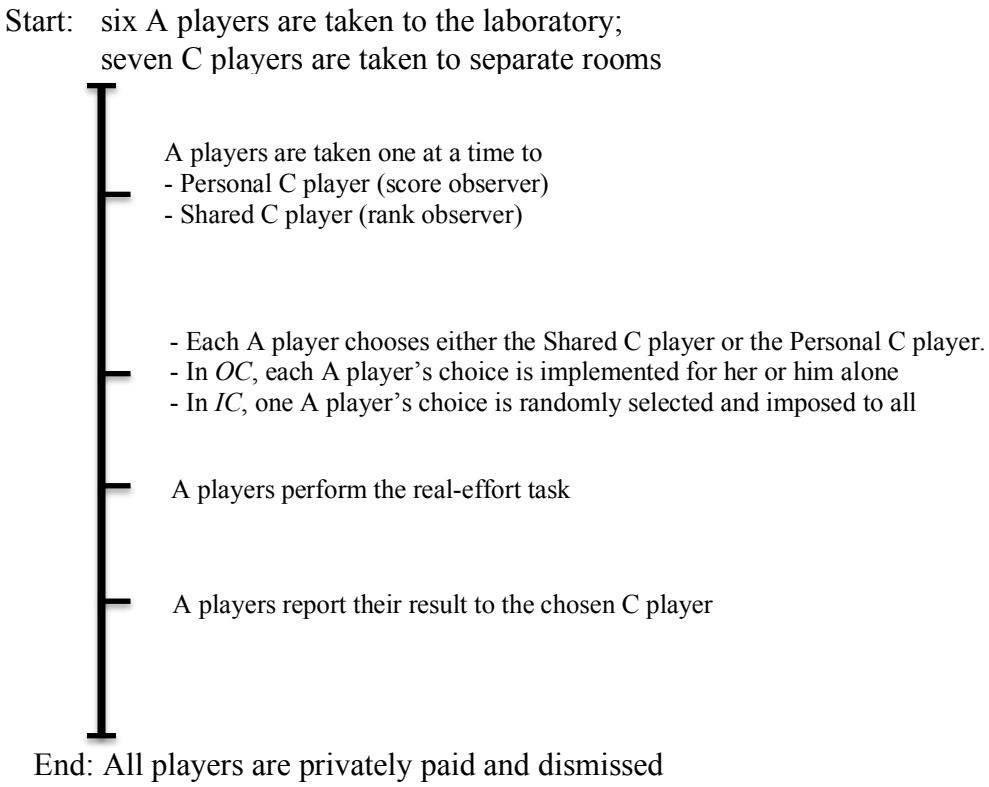
[16] Numbers in the cells were randomly generated. To avoid a high probability of very high sums, for each cell we first drew a random number between 40 and 99, say X. Then, we drew a random number (uniformly) between 10 and X.

Part 4

In Part 4 (not computerized), A players are required to report their performance (one at a time) to the chosen C player(s). As noted above, all A players are told their absolute score (the number of correct matrix solutions) and how this ranks amongst the six A players. Those who report to their Personal C state only their absolute score. Those that report to the Shared C state their relative score, that is, their absolute score and their rank.

Instructions for parts 2, 3 and 4 are distributed after completion of the previous part. In summary, Figure 1 displays the time line of the experiment.

Figure 1: Time Line



Hypotheses

Recall that our research question is inspired by the literature on a rivalry for resources. This literature reports that compared to men, women shy away from this dimension of competition. Our main hypothesis is that women will shy away from the status-ranking dimension as well. As mentioned above, there are two features in the rivalry literature

that might be important; these are captured in *OC* and *IC*, respectively. We have no way of knowing whether either of these is important for the 'shying away' result. A priori, we therefore hypothesize that our main hypothesis will hold in both of our treatments. This gives:

H1: *In the Own Choice treatment women will choose the Shared C player less often than men.*
H2: *In the Imposed Choice treatment women will choose the Shared C player less often than men.*

As discussed in the introduction, the gender of the C players might play a more prominent role in our social-status setting than the gender composition of participants does in the rivalry environment (Datta Gupta et al. 2013). At this stage, however, we have no specific hypothesis about *how* it will affect the choice of the decision maker (that is, the A player). Because of the exploratory nature of this endeavor, we refrain from formulating a formal hypothesis. Instead, we present an explorative question to be addressed with our data:

EQ1: Does the gender of the Personal C player and of the Shared C player differentially affect men and women's choices of the Shared C player?

3. Results

For all tests involving comparisons of means between independent samples, we apply two-sided permutation t-tests (henceforth, PtT), using 5000 repetitions of Monte-Carlo resampling. For the use of this test see, for example, Moir (1998). We prefer the permutation t-test over the more common Mann-Whitney test because the latter tests for differences in distributions of two independent samples. We are more specifically interested in differences in the means of the distributions. Moreover, permutation t-tests are exact tests. Moir (1998) shows that valid inference can be made with as few as eight observations. In appendix C of SBG19 we explain and discuss the merits of this method.

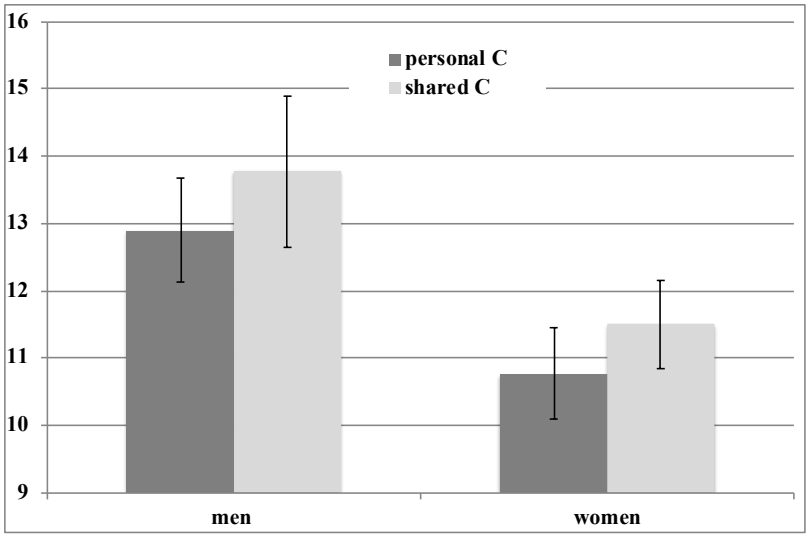
3.1. Performance

The choice of a C player might be affected by how one expects to perform in the task. Figure 2 shows (ex post) performance dependent on this choice. In *OC*, the own choice

is always implemented and performance might also be affected by this choice (a reverse causality). In *IC*, the implemented choice depends on the decision made by the selected A player. There is, of course, a selection effect underlying Figure 2; the C player one chooses might depend on how one expects to perform, hence, the division over the two types of C players is not random. Importantly, this selection effect may be different for men than for women.

We observe relatively minor differences in performance between those who choose the Personal C player and those who choose the Shared C player. For both men and women, the difference is statistically insignificant (men: PtT, $p = 0.51$, $N = 53$; women: PtT, $p = 0.47$, $N = 55$).[17] We also investigated whether performance is affected by the gender of the Shared C player for participants who report to this C player (either because they chose to, or because they were forced to in *IC*). There is no such effect.[18]

Figure 2: Performance and Chosen C player



Notes. Bars show the performance (measured as the number of correct summations). Error bars indicate one standard error.

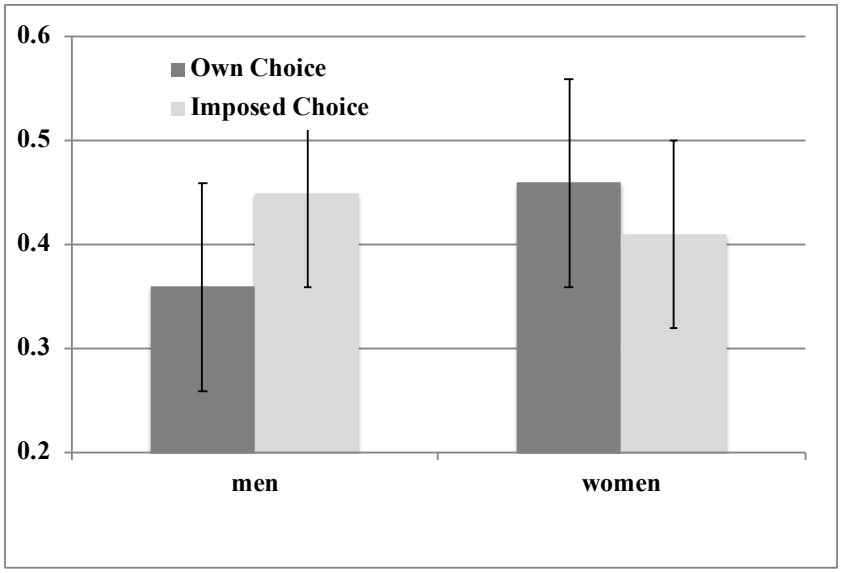
[17] Figure 2 also suggests that men outperform women, independently of the C player chosen. After having chosen the Personal C player, men perform significantly better than women (PtT, $p = 0.04$, $N = 62$). The difference after having chosen the Shared C player is marginally significant (PtT, $p = 0.08$, $N = 46$). One cannot, however, conclude from this that women underperform compared to men even in the absence of status ranking. Many factors that are not orthogonal to our treatments may affect performance of men and women facing the Personal C. These include the selection effects that might differ between men and women (as mentioned above) and the fact that randomly selected dictators sometimes determine the C player one faces. In contrast, the experiment in SBG19 is explicitly designed to study how reporting to an exogenously imposed Personal C player affects performance in comparison to having to report to an exogenously imposed Shared C. There, we observe no gender differences in the former case.

[18] We thank an anonymous reviewer for suggesting this. Women have an average of 12.4 (11.3) correct if the rank observer is male (female); this difference is statistically insignificant (PtT, $p = 0.39$, $N = 27$). Men have an average of 13.7 (12.8) correct if the rank observer is male (female); this difference is statistically insignificant (PtT, $p = 0.68$, $N = 24$).

3.2. Gender of Decision Maker and Status-Ranking Aversion

We now turn to our main hypotheses, which concern gender differences in the choice of C player, that is, in the choice of whether one prefers to be subjected to a social-status ranking environment. We start by investigating whether the choice for a C player depends on whether the choice holds only for oneself (*OC*) or it is imposed on the other A players in the session (*IC*). Figure 3 shows the fractions of times that participants chose the Shared C player (and not the Personal C player) before the real-effort task.

Figure 3: Choice of Shared C Player Across *OC/IC*



Notes. Bars show the fraction of participants that choose to report to the Shared C player. Error bars indicate one standard error.

Neither for men (PtT, p = 0.58, N=53) nor for women (PtT, p = 0.79, N=55) are the differences beween *OC* and *IC* significant. We conclude that at this aggregate level one's choice of whether or not to be subjected to status ranking by a Shared C does not depend on whether this choice holds only for the decision maker or it is enforced upon all others in the group. Note that at this stage, we are not yet considering differences across gender.

Considering the data aggregated over *OC* and *IC*, we notice that women choose the Shared C slightly more often than men (44% vs. 42%). This difference is statistically insignificant (PtT, p = 0.85, N = 108). As can be observed in Figure 3, women choose the Shared C more often than men in *OC* and less often than men in *IC*. Neither difference is statistically significant (*OC*: PtT, p = 0.56, N = 48; *IC*: PtT, p = 0.79, N = 60). Formally, for neither *OC* nor *IC* can we reject a null of no gender

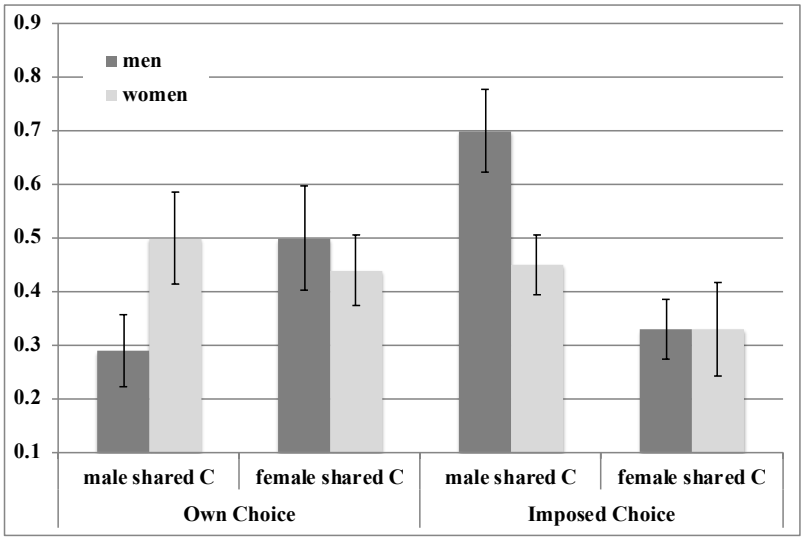
difference in favor of our hypotheses H1 or H2, respectively. We conclude that the effect of shying away does not carry over from the rivalry-for-resources dimension of competition to the status-ranking dimension, for either of the two environments we distinguish between.

As mentioned above, the comparison to the Niederle and Vesterlund (2007) results on gender differences in opting for a rivalry for resources is an imperfect one. However, we can use their results to perform a suggestive power calculation. Taking the Niederle and Vesterlund observed frequencies of choosing for competition (35% for women; 73% for men), a power of 80% would require a sample of 26 men and 26 women to conduct a t-test for differences in mean. The tests presented here are based on choices by 31 (22) men and 29 (26) women in *IC* (*OC*) in the A player role. The higher power of the permutation t-test compared to the t-test used for this power calculation suggests that the lack of effect cannot be attributed to an underpowered test.

3.3. Does the Gender of the Rank Observer Matter?

We now turn to our explorative question EQ1. A decision maker's choice might depend on the gender of the two C players (Personal vs. Shared) she can choose between. First, we consider whether the gender of the Shared C player affects this choice.[19]

Figure 4: Gender of Shared C Player



[19] A further subdivision depending also on the gender of the Personal C player would reduce the number of men and women per cell too much to provide meaningful summary statistics. The evidence provided in the logit regression below shows no evidence that the gender of the Personal C player affects the choice.

Notes. Bars show the fraction of participants that chose to report to the Shared C player, conditional on the Shared C player's gender. Error bars indicate one standard error.

Figure 4 shows the fraction of times that the Shared C player was chosen dependent on her or his gender. The results show more variation in men's choices than in women's. In particular, men choose a male Shared C player relatively rarely in *OC* and relatively often in *IC*. This difference is marginally significant (PtT, $p = 0.09$, $N = 24$). The variations appearing in Figure 4 are based on relatively low numbers of observations, however, due to the multiple subdivisions used.

For statistical testing we therefore use a logit specification and regress the choice to report to the Shared C player on the genders of the C players and a set of controls, with the baseline being the choices of male decision makers (i.e., male A players). We do so separately for *OC* and *IC*.

Table 2: Choosing the Shared C Player (Status-Ranking)

	Model I		Model II	
	OC	*IC*	*OC*	*IC*
Constant	–0.267	–2.986	–0.553	–3.795
Change possible[#]	–0.216	–0.234	–0.929	–0.537
Female Decision Maker	0.253	–0.193	1.081	–2.513 **
Age/10	0.057	1.164	0.252	2.617
Economics or Business	–0.529	1.077 *	–0.473	1.232 *
Female Personal C	—	—	1.352	–1.208
Female Shared C	—	—	1.731	–2.090 **
Female x Female Personal C	—	—	–1.125	2.523 **
Female x Female Shared C	—	—	–1.396	1.029
Female Personal C + Female x Female Personal C = 0 (χ^2, p-value)	—	—	0.05 0.820	2.01 0.157
Female Shared C + Female x Female Shared C = 0 (χ^2, p-value)	—	—	0.10 0.753	1.05 0.306
N	48	60	48	60

Notes. Cells give the coefficients from a logit regression of the choice of the Shared C player on the linear combination of regressors in the first column. The coefficients for 'Female Personal C' and 'Female Shared C' give the effects for male decision makers. The χ^2 results in the shaded rows test whether women are affected by the gender of the Personal or Shared C player. The first number in each of the shaded cells gives the χ^2 statistic and the second number its p-value. [#]: Sessions where participants could change the choice of C player after completion of the task; cf. footnote 13. */**: Significant at the 5%/1%-level.

Model I in Table 2 shows the results without correcting for the genders of the Shared C players. Here we find no gender differences in the likelihood of choosing the Shared C player; the coefficients for female decision makers (i.e. female A players) are not significantly different from zero for both *OC* and *IC*. Consistent with the results of the

permutation tests discussed above, the regression results show that the Niederle and Vesterlund's (2007) findings for rivalry for resources would appear *not* to carry over to the status-ranking dimension of competition, irrespective of whether we hold their 'non-imposition' or 'known group size' constant.[20]

This conclusion radically changes, however, if we control for the genders of the C players in interaction with the gender of the decision maker. First, we observe directly from the coefficients in model II (for both *OC* and *IC*) that men are not significantly affected in their choice by the gender of the Personal C player. Also, in *OC* men are not affected by the gender of the Shared C player. Men are affected, however, when their decision is imposed on others (*IC*). The effect is significantly negative, as reflected by the value of –2.090 of the coefficient for Female Shared C. This means that when the preferred choice is imposed on others men are more likely to prefer to report to the Shared C player if he is male than if she is female (as also observed in Figure 4).

A remaining question is whether Female Decision Makers condition their choice of the Personal and Shared C players on these players' gender. The answer is given by the chi-square tests shown in the lower part of Table 2 (where 'Female' is short for 'Female Decision Maker'). All tests show that the sums of effects are not significantly different from zero for both *IC* and *OC*. As in the case of men the gender of the Personal C player does not affect women's choices. Unlike for men, however, women's choices are not affected either by the gender of the Shared C.[21]

To aid in the interpretation of the regression results, Table 3 combines the numbers underlying Figure 4 with the statistical results of Table 2. We do so only for *IC*, because none of the gender effects for *OC* are siginficant (cf. Table 2).[22] This presentation gives a more synthetic overview of how the gender effects in *IC* depend on the Shared C player.

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[20] The only significant effect (5%-level) we observe is related to our control variable of whether the participants are graduating in Economics/Business or other fields of study. It seems that when the choice of a rank observer is imposed on others and thus the group size they will be compared within is known to the decision maker, those graduating in Economics or Business are more keen in choosing a status-ranking environment than those of other fields. This effect remains when correcting for the genders of the rank observer. This is an interesting finding that deserves more research, but it goes beyond the focus of this paper.

[21] We also ran the regressions in Table 2 separately for male and female decision makers. Doing so supports our conclusions: in *IC*, the effect of the gender of the shared C player is significant for men (N=31, p=0.042) and insignificant for women (N=29, p=0.359). Once again, no significant effects are observed at the 5%-level in *OC*.

[22] For presentational purposes, we do not vary the gender of the Personal C player. As shown in Table 2 this has no significant effect for male or female decision makers, in either specification.

Table 3: Gender Effects

		IC	
Shared C-player: Decision maker:	Man	Woman	Gender effect (p)
Man	0.70	0.33	0.027 **
Woman	0.45	0.33	0.306
Gender effect (p)	0.031 **	0.249	

Notes. Cells for gender combinations show observed frequencies of choosing the Shared C player. The last row shows p-values of χ^2 tests (based on the coefficients of Table 2) that test for differential effects based on the gender of the decision maker (i.e., the A player), conditional on the gender of the rank observer Shared C player (i.e., the Shared C player). The gender effects in the columns show p-values of χ^2 tests (based on the coefficients of Table 2) that test for differential effects of the gender of the Shared C player, given the gender of the decision maker.

This overview shows a large and significant effect that provides a statistical underpinning for the results observed in Figure 4. When the peer they report their relative performance to is a male, women choose the status-ranking environment much less frequently (25%-points) than men and the difference is significant. It is important to note, however, that this is only relative to men. The estimates in Table 3 clearly indicate that the effect is caused by men preferring status ranking when this is observed by other men; the chi-square test yields a significant difference at the 5% level (0.027**). In fact, women are (statistically) unaffected by the gender of the rank observer and are no different than men facing a female rank observer.[23]

4. Concluding Discussion

In this paper we use a novel design to study gender differences in the effects of social-status ranking while abstracting from rivalry for resources by using a non-competitive payment scheme. In a companion paper we used a related design to compare women's and men's performance when there is social-status ranking (SBG19) and found that women underperform compared to men in such an environment.[24] In this paper we have

[23] As a final analysis (suggested by an anonymous reviewer), we checked whether the gender composition of the group of A players affects the choice of C player. To do so, we ran a logit regression of the choice of the Shared C player on the number of female participants in the group, while correcting for the gender of the Shared C player. We do so separately for men and women, and for *OC* and *IC*. We found no significant effect at the 10%-level of the number of female participants in any of the four regressions.

[24] The question arises what the joint impact of rivalry for resources and social-status ranking will be in a setting where both are present, as is the case in many competitive environments. This is an issue that we are currently exploring in another research project.

studied a complementary question, namely whether women shy away from entering an environment involving social-status ranking. We do find that compared to men, women avoid situations where status ranking is salient, but only when the status-ranking is imposed onto others and when the ranking is observed by a man. This gender effect is mainly caused, however, by men seeking such ranking in this environment.

Our results point to the importance of taking into account the circumstances surrounding the situation in which competition takes place. First, it appears that it matters whether the size of the group that will be compared by a peer is known a priori. For status ranking this is achieved by having the decision imposed on others. In contrast, the shying-away-from-rivalry result reported in the literature involves a known group size without imposition. Our finding suggests that the fixed group size in these previous studies is more important for shying away than whether or not the decision is imposed.

The other circumstance that appears to be an important determinant of decision-makers' behavior in our experiments concerns the gender of other people involved in the situation. Similarly, in competitive environments with rivalry for resources the gender of other people involved in the situation could also affect behavior. At this point, the only evidence on whether this is the case stems from Gneezy et al. (2003) and Datta Gupta et al. (2013), who show that the gender differences in performance that are caused by rivalry for resources depend on the gender composition of the group of competitors. More evidence is needed to establish whether, for example, the gender of those overseeing the competition (such as the personnel manager in a hiring process) differentially affects men and women.

At this point, one may ask whether the real-effort task we use (*cf.* Screenshot 1) might affect our results. Of course, more research is needed to investigate whether this is the case. We stress, however, that this task has been used many times and that there are typically no gender differences in performance if the task is taken in isolation, that is, without any interaction with other participants whatsoever (Weber and Schram 2017, de Dreu et al. 2018, Schram et al. 2019, Zheng et al. 2019). We also have evidence from other experimental studies that we have conducted, that people do not believe that men and women will perform differently.[25] One reason that one might expect gender

[25]After a group of participants had done the real effort task, we asked them to predict whether men or women are better at this task. This belief elicitation was incentivized. We found no evidence that men

differences here is that this has the flavor of a maths related task. Note, however, that the cognitive task we use is not really a maths task. The main difficulty in our task is to find the highest number in each matrix, which is primarily a matter of concentration. Finally, note that a priori, our piece-rate incentives for the task might differentially affect men and women. The lack of gender differences when the task is done in isolation (SBG19), however, also provides evidence against this possibility.

Our results document that men seek social-status ranking when the ranking is observed by a man and when it is amongst all members of a group (as in our *Imposed Choice* treatment). From a practical point of view this implies that men might be overrepresented in the pool of applicants for professions for which rivalry for resources is less important and status ranking is salient. We have in mind, for example, positions in the judiciary, the military, NGOs, the churches and universities. In these professions people in high positions typically enjoy high status, while payoff differences across different ranks are often not large. At this point in history, the process of hiring in such situations where status ranking is salient, is more often dominated by men than by women. This fact may make men apply for such positions more than women do, with a significant social and economic impact. At the same time, our results suggest that increasing the number of women in management positions in such fields with little rivalry for resources may be difficult because men prefer that men are involved in the hiring decisions. Together, men dominating both the pool of applicants and the managerial positions may yield a high hurdle for women to overcome.

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(or women) are believed to be better at the task. This also holds if we separately consider men's and women's beliefs. More information is available upon request.

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Appendix A: Experimental Instructions

The instructions were read aloud in Spanish. Below is an English translation for the Imposed Choice treatment. Other instructions are available upon request.

A-Players

Part 1
Welcome to this experiment.

You will receive 5 euro for your participation in the experiment. Depending on your decisions and the decisions of other participants in today's experiment, you can earn money. You will be paid privately at the end of the experiment. In the experiment you will remain anonymous. Your decisions will only be linked to your station id and not to your name in any way. The experiment will take approximately 1 hour.

The participants in this experiment have been randomly divided into two groups. Six of you are of type A, seven of type C. The participants of type A are in this room, while the participants of type C are each in their own private room.

You are of type A.

The experiment is divided into two stages. You will receive instructions for each stage when it starts. We guarantee that everything we tell you in these instructions will proceed precisely as described. If you have any doubts about whether we are acting in the way described in the instructions, we will be happy to show you at the end of the experiment that this is the case.

We start with stage 1.

In stage 1 the participants of type A will all independently perform a task during 15 minutes.

This is an important task that is often used to measure people's talents. Many scientific studies have found that people who do well in a task like this are more successful in professional life than people who do less well. You will not be told, however, what is typically a good or a bad score for this task.

The task is as follows. You will see two matrices on the computer screen. Each matrix has 10 rows and 10 columns and is filled with randomly generated numbers. Your job is to find the largest number in each of the matrices and then to add them up. You are not allowed to use calculators, but you can use the paper and pencil that you have found on your desk.

After entering a sum the computer will tell you whether it is correct or incorrect (please note that the time will continue to run while you see this result). Subsequently, irrespective of whether your answer is correct or incorrect, a new pair of matrices will appear. This means that for each pair, you have only one attempt to provide the correct answer. However, there will always be new matrices as long as you are within the 15 minutes limit.

For each correct sum you will receive 1 euro and for each incorrect sum you will receive 0 euros. The total number of euros you have gained will be visible on the screen at the end of this stage.

Remember that studies have found that people who do well in a task like this are more successful in professional life. You will not know how people typically perform in this task. However, you will be told, how your performance relates to the other 5 participants of type A in this experiment, today.

After this stage, you will be told your own score and how you rank in relation to the other A-participants. You will then be asked to inform one participant of type C about your score. There are two types of participant C. First, each A-participant has been assigned an own C- participant. We call this your 'personal' C- participant. No other participant will ever report to your personal C- participant. Similarly, you will never report to any other A-player's personal C- participant.

One of the C-participants is a 'shared' C-participant. More than one A-participant may report their result to this shared C-participant. It will be explained later how it is determined whether you will report to your personal C-participant or to the shared C-participant.

After the task, you will have to go one at a time to a separate room where this C participant will be waiting. No C-player knows what task you did and what the score means. They have only been told that a higher score is thought to lead to a more successful professional life. Importantly, the shared C-participant will hear your score and how it ranks to the other A participants. Your personal C-participant will not be told the score of any other A-participant.

We would like you to see both your personal C participant and the shared C-participant that you may present your score to. For this reason, each of you will now first leave the room and read aloud a text that will be given to you. You will do this twice; first to your personal C-participant and then to the shared C-participant. Note that each of you will be going to the same shared C-participant.

[After they have returned:]

Now, you will be given a chance to choose to which C-participant you wish to report your score after you have finished the summation task. Recall that the shared C-participant can compare your score to others' but the personal C-player cannot. If you report to your personal C-participant, you will read to her or him your score, but not how it ranks among the A-participants. If you report to the shared C-participant, you will read to her or him your score, and how it ranks among the A-participants.

After everyone has made a choice, we will randomly pick one of the decisions made and apply it to all A-participants. Thus, if the chosen A-participant has indicated that he or she wants to report to the personal C-participant, then all A-participants will report to their own personal C-participant. If the chosen A-participant has indicated that he or she wants to report to the shared C-participant, then all A-participants will report to the (same) shared C-participant.

We will now hand out a form on which you can indicate your choice.

[randomly choose a form and announce the decision]

Part 2
This brings us to the end of the first stage of the experiment.

Now you will be asked to inform the chosen C-participant about your score. This is a C-participant C that you visited before. If the chosen C-participant is the personal C-participant, he or she will hear only your score. If the chosen C-participant is the shared C-participant, he or she will hear the scores and ranks of all A-participants.

For this purpose, each participant of type will receive from the experimenters a closed envelop with his/her score. Then each A-participant will be accompanied one by one by the experimenters to the room where the chosen C-participant is waiting. There, each A-participant will open the envelop and read aloud the text to the C-participant. Then the A-participant will return to her or his desk and the next A player will be taken.

Remember that the C-participant does not know what task you did and what the score means. He or she has only been told that a higher score is thought to lead to a more successful professional life.

C-players (all treatments)

Welcome to this experiment.

Your role in today's experiment is a passive one. You will not be asked to make any decisions.

Your only task is to hear the results of a task performed by one of the other participants. You will not be informed about the content of this task. All you need to know is that it is an important task that is often used to measure people's talents. Many scientific studies have found that people who have a high score

in a task like this are more successful in professional life than people who have a low score. You will not be told, however, what is typically a good or a bad score for this task.

Each of you will be seated in a separate room. One of us will take you there, shortly. While you are waiting for this, feel free to read anything you like, or to browse your phone. After you have been taken to a separate room, and before the other participants have started their task one or more of them will be taken to you. Each will read a text to you and return to the laboratory. After all the other participants have completed their tasks, the same participant or participants may again be taken to you. He or she will read to you his or her score.

You may not speak or interact with the other participants in any way. After they have left, you will be taken back to this room.

For your role in today's experiment, you will receive 15 euros on top of the 5 euros show-up fee. You will be paid and dismissed after the participants have told each of you their scores.

Finally, please treat the room you will be in with respect. You are a guest here, so please do not touch anything that is not yours.

Texts read to Personal C-players by A-players

Before the summation task:

Your station id is ……..
You must go to room # …….

Please read the following text to the participant waiting for you in that room:

"I will go back and do a task. After I have done so, I may come back and tell you my score."

After the summation task:

Your station id is ……..
You must go to room # …….

Please read the following text to the participant waiting for you in that room:

"My score on the task I did was …..."

Texts Read to Shared C players by A-players

Before the summation task:

Your station id is ……..
You must go to room # …….

Please read the following text to the participant waiting for you in that room:

"I will go back and do a task. After I have done so, I may come back and tell you my score. If so, I will also tell you how my score ranked amongst the six participants."

After the summation task:

Your station id is ……..

You must go to room # …….

Please read the following text to the participant waiting for you in that room:

"My score on the task I did was …….. With this score, I was ranked …… amongst the six participants."

Forms to indicate choice of C-player (for Imposed Choice)

Your station id is ……..

Please check a box to indicate your choice:

□ After the task, I wish everyone to report their score to their personal C-participant.
□ After the task, I wish everyone to report their score and rank to the shared C-participant.
