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Fairness in Winner-Take-All Competitions

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Fairness in Winner-Take-All Competitions*

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Abstract

This paper reports the results of a large-scale incentivized experiment investigating individuals' fairness perceptions of the extreme income inequalities generated in winner-take-all competitions. We find that extreme income inequality in winner-take-all competitions is commonly accepted in our sample of 4,000 participants from the general population of the U.S., even when the winner outperforms the runner-up by the smallest possible margin. Generally, fairness judgements are only weakly influenced by the winning margin, which reveals that the mere fact of winning—be it by a tiny margin or by a substantial gap—justifies resulting inequalities. Our results improve understanding of public attitudes toward fairness and redistributive policies in winner-take-all competitions marked by extreme income inequalities.

JEL Classification: C91, D31, D63
Keywords: Winner-take-all competitions, winning margin, merit, fairness, income inequality, redistributive policies

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1 Introduction

Winner-take-all competitions, in which very small performance differences can lead to extreme earnings differences, have long been prevalent in fields like sports, entertainment, and the arts (e.g., Rosen, 1981; Frank and Cook, 1995; Koenig, 2023). With the advent of globalization and digitalization, winner-take-all outcomes are increasingly observed in various other industries as well, such as search engines, online retailers, and social media platforms. In these sectors, a handful of "superstar firms" dominate their respective markets, capturing significant shares of the industry's total profits (e.g., Brynjolfsson and McAfee, 2014; Autor et al., 2020).[1]

This development is mirrored in the debate regarding the increasing share of earnings accruing to the top 1% of earners (e.g., Piketty and Saez, 2003; Atkinson et al., 2011; Alvaredo et al., 2013; Saez and Zucman, 2016). Atkinson et al. (2011) argue that "the rise in top earnings shares in several countries during the latter half of the postwar era can be explained by the superstar theory of Rosen (1981)" (p. 59). The debate holds relevance because "people have a sense of fairness and care about the distribution of economic resources across individuals in society" (Atkinson et al., 2011, p. 7). Our paper contributes to this debate by presenting the results of a large-scale experiment conducted with a general population sample of the U.S., designed to study people's fairness views on the extreme income inequality that arises in winner-take-all competitions.

To our knowledge, the experiment presented in this paper is the first to study the fairness of winner-take-all competitions, which are characterized by two key features:

1. The total value generated depends solely on the performance of the winner.

2. The winner receives the entire value created, while the runners-up receive nothing.

Our experimental design closely replicates these key features in a controlled environment. We recruited workers from an online labor market to complete a task and paired them. The total value generated by each pair depended solely on the performance of the more productive worker, the "winner," who earned the entire value created, while the "loser" earned nothing.

[1] Alfred Marshall described this development already over a century ago in his *Principles of Economics*: "A business man of average ability and average good fortune gets now a lower rate of profits on his capital than at any previous time; while yet the operations, in which a man exceptionally favoured by genius and good luck can take part, are so extensive as to enable him to amass a huge fortune with a rapidity hitherto unknown. The causes of this change are [...] the development of new facilities for communication, by which men, who have once attained a commanding position, are enabled to apply their constructive or speculative genius to undertakings vaster, and extending over a wider area, than ever before" (1920, 8th ed., Book VI, Chapter XII, Paragraph 11).

To assess people's views on the fairness of this extreme income inequality, we recruited subjects from the general U.S. population to act as "spectators." These spectators were randomly assigned to pairs of workers and given information about each worker's productivity and earnings. Their task was to decide how much of the winner's earnings should be redistributed to the loser. Since spectators had no financial interest in the outcome, we assume their decisions reflect their fairness views on the income inequality between the winner and the loser (c.f. Cappelen et al., 2013; Almås et al., 2020). The spectators' redistribution decisions are the main focus of this paper.

We conducted three winner-take-all treatments: workers self-selected into the winner-take-all competition (WTA), workers were automatically placed into the winner-take-all competition without a choice (WTA-No Choice), and workers were unaware of the winner-take-all competition (WTA-No Expectation). These treatments were designed to study the role of workers' self-selection into winner-take-all competitions and workers' earnings expectations on the spectators' redistribution decisions. We find that in all three winner-take-all treatments, there is substantial acceptance of inequality. Approximately one-third of the general population in the U.S. fully accepts the extreme earnings inequality resulting from winner-take-all competitions, opting not to engage in redistribution at all. On average, the winners receive about two-thirds of the total earnings generated.

To study whether this broad acceptance of inequality is driven by libertarian objections to redistribution or by merit-based arguments, we compare the spectators' redistribution decisions in the winner-take-all treatments with those in a Luck treatment. In the Luck treatment, earnings inequalities were induced by chance, with no merit-based considerations to justify the inequalities. We find that the proportion of spectators not engaging in redistribution, as well as the average share of earnings allocated to the winner, are significantly lower in the Luck treatment. This result aligns with the established finding that notions of merit are a fundamental factor in perceptions of fairness related to income inequality (e.g., Alesina and Angeletos, 2005; Bénabou and Tirole, 2006; Durante et al., 2014; Almås et al., 2020). The novel finding of our paper is to show that merit-based considerations significantly influence the acceptance of inequality even when the winner outperforms the loser by the narrowest margin possible, that is, when the impact of merit relative to luck is minimal.

To study the role of the winning margin on spectators' redistribution decisions more comprehensively, we utilize the random assignment of spectators in the winner-take-all treatments

to pairs of workers with varying performance differences between the winner and the loser. This design allows us to examine the causal effect of the winning margin on redistribution decisions. The data show that neither the proportion of spectators fully accepting the extreme earnings inequality nor the average share of earnings allocated to the winner strongly depends on the winning margin. This finding reveals that the mere fact of winning primarily determines spectators' acceptance of inequality, whereas the extent to which the winner outperformed the loser, by the minimal margin or by a substantial gap, is of lesser importance.

Moreover, we show that all our main results—the broad acceptance of inequality in winner-take-all competitions, the importance of merit-based justifications for inequality even when the impact of merit is minimal, and the general insensitivity of fairness judgements to the winning margin—are consistently observed across various subgroups of the U.S. population, categorized by political orientation, education, gender, and age. Finally, we demonstrate that the spectators' behavior in the experiment is closely related to their views on fairness and policy regarding real-world issues. For instance, our data reveal that spectators who favor more redistribution in the winner-take-all treatments are significantly more likely to support increasing taxes on the top 1% of income earners.

Our study contributes to the literature on what people view as a fair distribution of resources and how fairness considerations shape individual behavior (e.g., Fehr and Schmidt, 1999; Tyran and Sausgruber, 2006; Cabrales et al., 2010; Dufwenberg et al., 2011; Bartling et al., 2015; Hvidberg et al., 2023; Exley and Kessler, 2024; Maréchal et al., Forthcoming). Specifically, existing work documents the importance of *merit* for perceptions of fairness (e.g., Alesina and Angeletos, 2005; Bénabou and Tirole, 2006; Alesina and Giuliano, 2011; Durante et al., 2014; Alesina et al., 2018; Almås et al., 2020). However, interpretations of what constitutes merit can vary significantly. In particular, in winner-take-all competitions, a *factual merit* argument asserts that winners are entitled to their earnings because these earnings directly result from their performance. Conversely, a *counterfactual merit* argument posits that a winner's earnings should reflect their additional contribution compared to what the runner-up would have achieved. Our paper takes a step toward "unpacking" the general concept of merit. Indeed, our data align more closely with the *factual merit* fairness perspective, which argues against redistribution: the winner deserves the earnings since these are solely determined by their performance and unaffected by the performance of the runner-up. In contrast, the *counterfactual merit* perspective would advocate for considering the winning margin in redistribution

decisions, as the earnings within a pair of workers would not be zero if the winner produced nothing; they would be determined by the performance of the runner-up.

Relatedly, a large literature in behavioral economics and social psychology has shown the importance of *proportionality*: many people tend to view income inequalities as fair if these inequalities are proportional to differences in performance (e.g., Adams, 1965; Walster et al., 1973; Leventhal, 1980; Konow, 2000; Frohlich et al., 2004; Cappelen et al., 2007, 2010, 2013). In contrast, our data indicate that in winner-take-all competitions, many people accept extreme income inequality that is not proportional to differences in performance. The most extreme case occurs when the winner outperforms the runner-up by the smallest possible margin: the performances of the winner and loser are almost identical, but the earnings are vastly different and thus not proportional to performance at all.

Finally, our results contribute to the political economy literature on redistribution (e.g., Fong, 2001; Alesina and Giuliano, 2011), by showing that the mere fact of winning, even by a tiny margin, is a major factor in justifying extreme income inequalities. This finding appears to align with Mankiw's (2010) intuition on people's fairness views: "My sense is that people are rarely outraged when high incomes go to those who obviously earned them. When we see Steven Spielberg make blockbuster movies [...], we don't object to the many millions of dollars they earn in the process" (p. 295). Consequently, the focus on redistribution from the top 1% income earners in society (e.g., Atkinson et al., 2011) may not resonate very broadly in the general population.

The paper is organized as follows. Section 2 presents our experimental design. Section 3 reports our main results. Section 3.1 shows the broad inequality acceptance in all our winner-take-all treatments. Section 3.2 studies the role of merit. Section 3.3 studies the role of the winning margin. Section 3.4 shows that our results hold in various subgroups of the U.S. population. Section 3.5 demonstrates that the behavior of spectators in the experiment is related to their views on fairness and policy regarding real-world issues. Section 4 concludes.

2 Experimental Design

The study involves two types of participants: spectators and workers. The spectators are tasked with making redistribution decisions that affect the workers. Our focus lies on the spectators' redistribution decisions, while the workers serve primarily to ensure that these decisions have real consequences.

The experimental design comprises two phases: a work phase and a redistribution phase. During the work phase, workers have the opportunity to earn money by completing a task. This is followed by the redistribution phase, wherein the spectators can redistribute the earnings among the workers. We explain the details of the two phases and our treatments next.

2.1 The Work Phase

In the work phase, each worker had the opportunity to earn money. Workers were randomly assigned to one of four experimental treatments: WTA, WTA-No Choice, WTA-No Expectations, and Luck. Regardless of the assigned treatment, the task for all workers involved solving up to 24 pattern recognition problems within a ten-minute timeframe.

In the WTA treatment, workers had to chose between a piece rate and a winner-take-all competition. The piece rate offered workers 5 U.S. cents for each problem correctly solved. For those selecting the winner-take-all competition, workers were paired randomly, and they were explicitly informed that their pairing would be with another worker who had opted for the competition. In each pair, the worker with the higher performance, the "winner," would receive 15 U.S. cents for each problem solved correctly, while the other participant, the "loser," would not earn any reward. This setup embodies the core principles of a winner-take-all competition: only the winner obtains earnings, and the magnitude of the earnings is fully determined by the winner's performance.[2] Workers were informed beforehand that their earnings could be subject to redistribution in the winner-take-all competition but not in the piece-rate condition.[3]

The WTA-No Choice treatment mirrors the WTA treatment in all aspects except for the element of choice between the piece-rate and the winner-take-all competition: Each worker was directly paired with another worker in a winner-take-all competition. The objective of contrasting the WTA and WTA-No Choice treatments is to examine the causal impact of workers' self-selection into the winner-take-all competition on the spectators' redistribution decisions.

The WTA-No Expectations treatment is analogous to the WTA-No Choice treatment regarding the automatic assignment of workers to the winner-take-all competition. However, a distinctive feature of the WTA-No Expectations treatment is that workers were not informed about the potential for earning money nor that they were participating in a winner-take-all competition. Instead, participants were simply instructed to solve 24 pattern recognition problems

[2] In the event of a tie, where no distinct winner could be determined, both workers would receive the piece-rate compensation of 5 U.S. cents for each correctly solved problem and were not matched with a spectator.

[3] Workers who opted for the piece-rate were not matched with a spectator.

within a ten-minute timeframe. Comparing the WTA-No Choice and WTA-No Expectations treatments allows studying the causal impact of the workers' expectations regarding their earnings on the spectators' redistribution decisions.

The Luck treatment is analogous to the WTA-No Choice treatment in that workers are unaware of the potential to receive earnings. The distinction lies in the reward structure: in all other treatments, earnings are determined through a winner-take-all competition, whereas in the Luck treatment, earnings are independent of workers' performance. In the Luck treatment, we paired workers randomly and assigned one worker in each pair the same earnings as those of a winner in a randomly matched pair from the WTA treatment. The other worker in the pair received no earnings, mirroring the outcome for the loser in the WTA treatment. Both treatments comprised an identical number of worker pairs, ensuring that the earnings distribution is identical in the WTA and Luck treatments. The objective of the Luck treatment is to serve as a reference point for evaluating spectators' redistribution decisions in scenarios devoid of any merit-based rationale for earnings differences between workers within a pair.

A summary of the differences between the four treatments is presented in Table 1. In none of the treatments were workers informed of their absolute or relative performance following the completion of the task during the work phase. Workers were only made aware of their earnings after redistribution, a fact that was also known to the spectators.

[Table 1 about here]

2.2 The Redistribution Phase

To investigate the spectators' redistribution decisions, each spectator was randomly assigned to a pair of workers. The spectators were provided with three sets of information:

1. The way in which earnings were determined for the assigned pair of workers: either through a winner-take-all competition (in WTA, WTA-No Choice, and WTA-No Expectations treatments) or by chance (in the Luck treatment). Additionally, spectators learned whether the workers had the option to choose their reward structure (only in WTA) and whether the workers were aware of the reward structure (in WTA and WTA-No Choice) or not (in WTA-No Expectations and Luck).[4]

[4]Recall that there is no redistribution phase for workers who opt for the piece rate in the WTA treatment, nor for workers who tied in the winner-take-all competition.

2. The number of problems each worker correctly solved in the winner-take-all treatments. This performance metric was not disclosed in the Luck treatment, where spectators were only informed that both workers had completed the task (i.e., had spent 10 minutes solving pattern recognition problems).

3. The earnings of each worker. In the winner-take-all treatments, earnings could be inferred from performance data, whereas this inference is not possible in the Luck treatment.

Spectators were subsequently asked whether they wished to redistribute earnings from the winner (the worker who received all earnings) to the loser (the worker who received none). In the experimental instructions, we did not use the terms "winner" and "loser," instead referring to the workers neutrally as "participant X" and "participant Y."

2.3 Methods

We recruited 4,000 participants to serve as spectators from the general U.S. population through an international survey provider (Research Now, now operating as Dynata). The average age of the spectators is 47 years, with 51 percent being female. The average level of educational attainment is a 2-year college degree. Politically, 34 percent of participants identified as Republicans, 34 percent as Democrats, and 32 percent as independents.[5] The workers were recruited from the online labor market Amazon Mechanical Turk. Each spectator was randomly assigned to one pair of workers following a 5:1 matching protocol, meaning each pair of workers was assigned to five different spectators, but only the decision of one spectator was implemented.[6] Payments to workers were based on the decisions of selected spectators and were made within two weeks. The design ensured that experimenters could not link decisions to individual spectators. Before collecting decisions from the spectators, we registered a pre-analysis plan at the AEA RCT registry.[7] Detailed experimental instructions, including examples of the pattern recognition problems, are provided in Online Appendix D.

[5] All collected background characteristics are balanced across treatments. See Table A.1 in Online Appendix A for more details on the background characteristics.

[6] 800 pairs of workers participated in the redistribution phase, evenly distributed across treatments. Pairs in which workers tied in performance were excluded because unique winners could not be determined. We oversampled the number of workers since approximately 70 percent selected the piece rate in WTA, and about 10 percent of the pairs resulted in ties. All workers not included in the redistribution phase were compensated at the piece rate based on their individual performance.

[7] Access the pre-analysis plan at `https://www.socialscienceregistry.org/trials/3155`. It builds on the results of a previous implementation of the design with a student sample; see Online Appendix C. In the pre-analysis plan we stated that we would focus on the two outcome variables *All to winner* and *Share to winner*. We also stated that we would use the general population data set to explore heterogeneous treatment effects with respect to, e.g., political orientation and views on income inequality.

3 Results

We analyze the spectators' redistribution decisions in our three winner-take-all treatments first. The treatment comparisons allow studying the causal impact of workers' self-selection into winner-take-all competitions and their earnings expectations on the spectators' redistribution choices. Secondly, we study the role of merit-based arguments on spectators' acceptance of inequality by comparing their redistribution decisions in the winner-take-all treatments with those in the Luck treatment. We specifically consider the case of the minimal winning margin to study the role of merit for inequality acceptance when differences in merit are minimal. Thirdly, we utilize random variation in the winning margin among pairs of workers to assess more comprehensively how the spectators' redistribution decisions are influenced by the extent to which the winner outperforms the loser. Fourthly, we analyze the influence of spectators' background characteristics on their redistribution decisions. Finally, we examine how spectators' redistribution decisions correlate with their views on the fairness and acceptability of the earnings of real-world "superstars" and the taxation of the top 1% income earners.

3.1 Redistribution Decisions in Winner-Take-All Competitions

Figure 1 displays histograms of the shares of earnings allocated to the winner by spectators across the three winner-take-all treatments. In the leftmost panel, which shows the spectators' redistribution decisions in the WTA treatment, it is apparent that the modal choice is to completely abstain from redistribution: approximately 35 percent of spectators assign the entirety of the earnings to the winner. On average, winners receive 67 percent of the earnings. Around 10 percent of spectators opt to fully equalize income between the winner and the loser. We also observe that a fraction of the spectators allocates a larger share of the earnings to the loser than to the winner, with a few allocating all earnings to the loser.[8]

[Figure 1 about here]

[8]Such choices might reflect that some spectators want to compensate the loser for potentially inferior life outcomes relative to the winner. Nonetheless, the possibility that these decisions stem from a lack of attentiveness to the experiment cannot be dismissed. Indeed, in Section 3.5, where we link spectators' redistribution decisions to their views on the earnings of "superstars" and the taxation of the top 1% income earners, we provide evidence suggesting that these spectators were confused during the experiment. In Online Appendix B we provide a robustness check and show that our results prevail in the sub-sample that excludes the spectators who allocate more to the loser than to the winner.

Comparison of the redistribution decisions of spectators across the three winner-take-all treatments, Figure 1 reveals that the distributions of the shares of the earnings allocated to the winner are remarkably similar. This suggests that workers' self-selection into the winner-take-all competition and their earnings expectations have little influence on the spectators' redistribution decisions.

In the following, we focus on two key indicators of spectators' acceptance of inequality: (i) the proportion of spectators who allocate the entirety of the earnings to the winner, and (ii) the average share of earnings that is allocated to the winner. Regression analyses, reported in Table A.2 in Online Appendix A, support the observation that the redistribution decisions of spectators across the three winner-take-all treatments exhibit remarkable consistency. These analyses reveal no significant treatments differences in terms of our two key indicators ($p > 0.10$ for all binary comparisons). We summarize the findings thus far in our first result.

Result 1: *In all winner-take-all treatments, about one-third of the general population in the U.S. accepts the extreme earnings inequality resulting from winner-take-all competitions, choosing not to engage in redistribution. Winners, on average, receive about two-thirds of the earnings generated in the winner-take-all competition.*

3.2 The Role of Merit for Inequality Acceptance

In this section, we examine the role of merit-based arguments in the pronounced acceptance of inequality observed across the three winner-take-all treatments. To this end, we compare the redistribution decisions of spectators in the winner-take-all treatments, where the workers' individual performance not only determines the winner but also their earnings, with those in the Luck treatment, where the determination of the winner and the winner's earnings are independent of the workers' performance.[9]

Figure 2 shows the distribution of the shares of earnings allocated to the winner in the three winner-take-all treatments, adjusted by subtracting the corresponding shares observed in the Luck treatment. The left panel of Figure 2 includes all redistribution decisions from all four treatments. Two differences between the winner-take-all and the Luck treatments stand out. Firstly, the proportion of spectators giving all earnings to the winner, our first indicator of spectators' acceptance of inequality, is substantially larger in the winner-take-all treatments

[9]Given the lack of significant differences in the spectators' redistribution decisions across the three winner-take-all treatments, we have aggregated the data from these treatments for most subsequent analyses.

compared to the Luck treatment. Secondly, the proportion of spectators equalizing the winner's and the loser's earnings is markedly lower in the winner-take-all treatments compared to the Luck treatment. Together, these differences result in the average share of earnings allocated to the winner, our second indicator of spectators' acceptance of inequality, being substantially smaller in the Luck treatment than in the winner-take-all treatments.

[Figure 2 about here]

The right panel of Figure 2 includes only data from spectators in the winner-take-all treatments who were matched to pairs of workers where the winner solved exactly one more problem than the loser, but retains all observations from the Luck treatment.[10] The analysis, even when narrowed to instances with the minimal winning margin in the winner-take-all treatments, reveals the same pattern: a substantially higher proportion of spectators allocate all earnings to the winner in the winner-take-all treatments compared to the Luck treatment, and a substantially lower proportion of spectators fully equalize the earnings of the winner and the loser.

The patterns observed in Figure 2 are corroborated by the regression analyses presented in Table 2. In all models, the omitted category is the Luck treatment. Models (1) to (4) estimate the proportion of spectators who allocate all earnings to the winner, whereas models (5) to (8) estimate the share of earnings given to the winner. *WTA Competition* is an indicator variable that assumes a value of one for data derived from the three winner-take-all treatments.

[Table 2 about here]

Model (1) estimates that the proportion of spectators allocating all earnings to the winner is 15.6 percentage points higher in the winner-take-all treatments compared to the Luck treatment, in which the corresponding proportion is 17.2 percent. Model (2) controls for the spectators' background characteristics, yielding a coefficient for *WTA Competition* that remains essentially unchanged. Model (3) accounts for variations in workers' earnings levels and the differences in earnings by limiting the analysis to observations from both the WTA treatment and the Luck treatment (excluding the WTA-No Choice and WTA-No Expectations treatments).[11] The

[10] The minimal winning margin of a single probelm occurred in 13.3 percent of the worker pairs in the winner-take-all treatments, corresponding to precisely 400 instances.

[11] Recall that in the Luck treatment, worker pairs are assigned the earnings from their counterparts in the WTA treatment. This design feature guarantees that the distribution of income levels and income differences among workers is precisely identical across both treatments.

coefficient associated with *WTA Competition* in model (3) is even slightly higher than those observed in models (1) and (2). Model (4) specifically examines spectators across the winner-take-all treatments who were matched to worker pairs where the winner outperformed the loser by the smallest possible winning margin, i.e., by exactly one problem. In this model, the coefficient for *WTA Competition* is slightly lower, but still indicating a statistically highly significant difference of 12.6 percentage points.

Models (5) to (8) are analogous to models (1) to (4). Model (5) estimates that, in the winner-take-all treatments, the winners' share in overall earnings is approximately 12 percentage points larger compared to the Luck treatment, in which the share of earnings allocated to the winner is about 55 percent. Models (6) and (7) demonstrate that the coefficient for *WTA Competition* remains essentially unchanged when the analysis incorporates controls for the spectators' background characteristics, and additionally controls for earnings levels and earnings differences among workers, respectively. In model (8), which focuses exclusively on the smallest winning margin within the winner-take-all treatments, the difference narrows yet remains statistically highly significant, with the winner's share in earnings being eight percentage points larger in the winner-take-all treatments than in the Luck treatment. We summarize these findings in the next result.

Result 2: *The proportion of spectators not engaging in redistribution and the average share of the earnings allocated to the winner are significantly larger in the winner-take-all treatments compared to the Luck treatment. These differences are evident even when the winner outperforms the loser by the narrowest margin possible in the winner-take-all competition.*

The result shows that merit-based considerations significantly influence spectators' acceptance of inequality. Notably, these merit-based arguments against redistribution retain their impact even in scenarios where the winner only marginally outperforms the loser, such as when the winner solves just one more problem than the loser. In these cases, the average number of problems solved by the winner and the loser are 17.8 and 16.8, respectively. Hence, the performance of the winner and the loser is very similar, with the winner's share of the total number of problems solved being just slightly higher than 50 percent on average. Nonetheless, a *factual merit* fairness argument can be made, asserting that the winner is entitled to their earnings as these were directly generated by their performance, independent of the loser's performance.

3.3 The Role of the Winning Margin for Inequality Acceptance

In this section, we study the role of the winning margin for the spectators' inequality acceptance in winner-take-all competitions more comprehensively. Our experimental design involves the random assignment of spectators in the winner-take-all treatments to pairs of workers, which differ in the performance differences between the winner and the loser. In many cases, the margin is minimal, with the winner solving merely one additional problem compared to the loser. In other instances, the winning margin is substantially larger, with the maximum observed difference in our sample being 21 problems.[12] Importantly, the winning margin was disclosed to the spectators prior to making their redistribution decisions.

The upper panel in Figure 3 shows the proportion of spectators who allocate everything to the winner in the winner-take-all treatments, as a function of the winning margin. The lower panel displays the share of earnings allocated to the winner in the winner-take-all treatments, also as a function of the winning margin. The figure reveals that the winning margin does not strongly influence either the proportion of spectators who allocate everything to the winner or the share assigned to the winner.[13]

[Figure 3 about here]

The observations depicted in Figure 3 are corroborated by the regression analyses presented in Table 3. Models (1) to (3) estimate the proportion of spectators who allocate all earnings to the winner, whereas models (4) to (6) estimate the share of earnings allocated to the winner. *Winning Margin* is the number of problems by which the winner in a pair of workers outperformed the loser, ranging from 1 to 21.

[Table 3 about here]

Model (1) estimates that the proportion of spectators allocating all earnings to the winner increases by 0.6 percentage points for each additional problem by which the winner outperforms the loser, starting from an estimated baseline of approximately 30 percent. Model (2)

[12] Figures A.1 and A.2 in Online Appendix A illustrate the distribution of the workers' performances and of performance differences within pairs, respectively, in the winner-take-all treatments.

[13] Figures A.3 and A.4 in Online Appendix A show that the same patterns prevail if we consider treatments WTA, WTA-No Choice, and WTA-No Expectations separately.

controls for spectators' background characteristics. Model (3) additionally accounts for the number of problems solved by the winner, captured by *Performance Winner*, to capture the role of the winning margin independently of the winner's performance. The coefficients for *Winning Margin* remain essentially unchanged in models (2) and (3).

Models (4) to (6) are analogous to models (1) to (3). Model (4) estimates that the winners' share in the earnings increases by about 0.6 percentage points for each additional problem by which the winner outperforms the loser, starting from an estimated baseline of approximately 64 percent. Models (5) and (6) demonstrate that the coefficient for *Winning Margin* remains essentially unchanged when the analysis incorporates controls for the spectators' background characteristics, and additionally controls for the winner's performance, respectively.

To put the quantitative results into perspective, we compare the coefficients for *WTA Competition* in Table 2 to the coefficient for *Winning Margin* in Table 3. Even in the weakest case for merit, where we compare "no merit" (Luck treatment) to "minimal merit" (winning by a margin of one in the winner-take-all treatments), the proportion of spectators allocating all earnings to the winner and the share of earnings allocated to the winner increase by over 12 and 8 percentage points, respectively. In contrast, the size of the winning margin has a much weaker impact. For instance, in more than 50 percent of cases, the winning margin is four or less, and quadrupling the winning margin from one to four increases both of our indicators of inequality acceptance by less than two percentage points. We summarize our findings regarding the role of the winning margin in the following result.

Result 3: *The proportion of spectators not engaging in redistribution and the average share of earnings allocated to the winner do not strongly depend on the winning margin.*

Our results indicate that the mere fact of winning primarily determines spectators' acceptance of inequality, while the extent to which the winner outperformed the loser is of lesser importance. This finding aligns with a *factual merit* fairness argument, which asserts that the winner is entitled to their earnings because they directly result from their own performance. Notably, these earnings are independent of the runner-up's performance. In contrast, a *counterfactual merit* fairness argument would more strongly advocate for considering the winning margin when making redistribution decisions, considering the value added by the winner. For instance, in worker pairs with the minimal winning margin of one, the winner's performance averaged 17.8 problems solved; hence, the earnings would not have been much different, av-

eraging 16.8 problems, had the winner produced nothing. In contrast, in worker pairs with a winning margin of four, the value added by the winner is much larger. In these cases, the winner's average performance was 18.8 problems solved, 27 percent higher than the runner-up's average performance of 14.8 problems.

3.4 Heterogeneity Analysis

Our large-scale, general population sample enables us to investigate whether various subgroups of the U.S. population, categorized by political orientation, education, gender, and age, differ in their redistribution decisions.

The upper left panel of Figure 4 shows the proportions of spectators within each of the eight subgroups considered, who do not engage in redistribution at all in the winner-take-all treatments. The panel indicates that at least 30 percent of the spectators in each subgroup allocate all earnings to the winner in winner-take-all competitions, with the sole exception of below-median age spectators ("Young"), where this proportion amounts to 27 percent. This finding reveals that within each examined subgroup, a significant proportion fully accepts the extreme earnings inequality inherent in winner-take-all competitions.

[Figure 4 about here]

We next investigate whether the observed difference in the proportion of spectators who do not redistribute between the winner-take-all treatments and the Luck treatment persists across all population subgroups. To this aim, we estimate models (2) and (4) from Table 2 separately for each subgroup. The upper right panel displays the respective coefficients for *WTA Competition* when we consider all winning margins (corresponding to model (2) in Table 2). The lower left panel displays the respective coefficients for *WTA Competition* when we restrict the analysis to spectators who are matched to worker pairs with the smallest possible winning margin (corresponding to model (4) in Table 2). The two panels reveal that the proportions of spectators not engaging in redistribution are significantly larger in the winner-take-all treatments compared to the Luck treatment across all subgroups, even when the winning margin is the smallest possible.[14]

[14]The upper right panel also reveals that the causal effect of merit on the proportion of spectators not redistributing at all is significantly larger in the subgroup of college-educated spectators than in the subgroup of non-college-educated spectators, with a difference of about 10 percentage points. This difference is also pronounced, but not statistically significant, in the much smaller sub-sample that considers only the smallest winning margin.

Finally, we examine the causal effect of the winning margin on the spectators' redistribution decisions within each subgroups. To this aim, we estimate model (2) from Table 3 separately for each subgroup. The lower right panel shows the respective coefficients for *Winning Margin*. The comparison of coefficients in the lower left panel, which illustrates the causal impact of "minimal merit," i.e., winning by the smallest possible margin in the winner-take-all treatments, with those in the lower right panel, illustrating the causal effect of increasing the winning margin by one problem, highlights the relatively minor influence of the winning margin on inequality acceptance across all subgroups.[15]

In summary, the heterogeneity analysis reveals that our findings regarding the proportion of spectators not engaging in redistribution are robustly found in all examined subgroups.[16]

3.5 Fairness Views and Policy Attitudes

We now turn to an analysis of how spectators' behavior in the experiment relates to their views on fairness in real-world scenarios and their policy attitudes. To this end, we incorporated three questionnaire items into our study.

The first item featured an intuitive description of a winner-take-all competition, taken from Frank and Cook's popular science book, The Winner-Take-All Society (1995): *"Olympic gold medalists go on to receive millions of dollars in endorsements, while the runners-up are quickly forgotten—even when the performance gap is almost too small to be measured"* (p. 17) and asked the spectators: "Do you find this fair or unfair?" Responses were collected using a seven-point scale, ranging from "entirely fair" to "entirely unfair."

The second item presented a claim by Mankiw (2010, 2013), articulated in defense of the earnings of "superstars:" *"When we see Steven Spielberg make blockbuster movies, Steve Jobs introduce the iPod, David Letterman crack funny jokes, and J.K. Rowling excite countless young readers with her Harry Potter books, we don't object to the many millions of dollars they earn in the process"* (2010, p. 295). Spectators were asked: "Do you agree with this statement?" Answers could be provided on a seven-point scale from "fully agree" to "fully disagree." A crucial aspect of both questions is that they explicitly relate to winner-take-all scenarios where merit, rather than just luck, determines the winner.

[15]Tables A.3 and A.5 in Online Appendix A present all regression models.

[16]Figure A.5 and Tables A.4 and A.5 in Online Appendix A present the corresponding analysis for our second indicator of inequality acceptance, the share of earnings allocated to the winner. The analysis confirms that our results are consistent across all eight subgroups also for our second indicator of inequality acceptance.

The final item pertains to the taxation of the top 1% income earners. We posed the following question: *"Do you believe that the income tax rates for the top 1% of earners should be increased, remain unchanged, or be decreased?"* Responses were collected using a three-point scale: "Increase," "Stay the same," or "Decrease."[17]

Figure 5 displays histograms of the responses to three questionnaire items, revealing substantial heterogeneity among the spectators. The responses to the "gold medalist question" (item 1) are relatively symmetric around the midpoint of the scale, with only a small minority selecting the extreme responses "entirely unfair" or "entirely fair." Conversely, the responses to the "superstar question" (item 2) are notably skewed toward agreement. The majority of respondents either mostly or fully agree that superstars like Steven Spielberg or Steve Jobs deserve their earnings, although approximately 10 percent express some level of disagreement. Regarding the taxation of the top 1% earners (item 3), approximately 55 percent of respondents believe that taxes should be increased, while a small minority of about 10 percent think taxes should decrease.[18]

[Figure 5 about here]

Models (1), (3), and (5) in Table 4 demonstrate that spectators who allocate all the earnings to the winner in the winner-take-all treatments tend to (i) provide a significantly higher fairness rating to the gold medalist question, (ii) express significantly higher agreement with the statement that superstars deserve their earnings, and (iii) are more likely to indicate that the taxes of the top 1% income earners should either decrease or remain the same, rather than increase. Models (2), (4), and (6) show that the coherent relation of redistribution decisions and questionnaire responses is robust to the inclusion of controls for the spectators' background characteristics.[19] The analysis reveals that the spectators' behavior in the experiment is closely related to, and therefore contributes to, understanding people's fairness views and policy attitudes.[20]

[17]The questionnaire is part of the experimental instructions provided in Online Appendix D.

[18]Pairwise correlations between the view that the earnings of gold medalists are fair and (i) agreement with the earnings of superstars and (ii) the view that taxes for top income earners should decrease rather than increase are 0.31 and 0.08, respectively ($p < 0.01$ in both cases). Agreement with the earnings of superstars and the view that taxes for top income earners should decrease rather than increase is not correlated (-0.01, $p = 0.36$).

[19]Interestingly, one background characteristic that demonstrates a strong and consistently significant relationship with the questionnaire items is political affiliation. Compared to Democrats and Independents, Republicans are more likely to give higher fairness ratings to the gold medalist question, agree more strongly that superstars deserve their earnings, and prefer that taxes on the top 1% either decrease or remain the same, rather than increase.

[20]Table A.6 in Online Appendix A presents the analysis for our second indicator of inequality acceptance, the

[Table 4 about here]

The analysis of how spectators' behavior in the experiment relates to their fairness views and policy attitudes also addresses the broader question of the external validity of results derived from experimental settings. Our design provides a high level of control over the scenarios in which spectators can redistribute earnings from the winner to the loser. Specifically, the winner and the winner's earnings are fully determined by performance in the winner-take-all competition, and spectators have precise information about the winning margin. Conversely, the Luck treatment completely eliminates the influence of merit by randomly selecting winners, with the allocated earnings being independent of the winners' performance. A potential limitation of the experimental approach is that these conditions might be perceived as contrived by participants, which could impact the generalizability of our results. However, we interpret the findings in this section, which document a coherent relationship between spectators' behavior in the experiment and their fairness views and policy attitudes elicited in the questionnaire, as supporting the external validity of our experimental data.

4 Conclusions

We report results from an experimental study examining the fairness views of the general population in the U.S. regarding extreme income inequality resulting from winner-take-all competitions. The increasing prevalence of winner-take-all markets is argued to be a driving factor behind the recent rise in top earnings shares (Atkinson et al., 2011). A major focus in the current policy debate on inequality is the substantial share of income received by the top 1% of earners. While this has prompted calls for increased redistribution by some (Atkinson et al., 2011), others contend that this development is fair (Mankiw, 2010, 2013). Our experiment

share of earnings allocated to the winner. Models (1), (4), and (7) in Table A.6 correspond to Models (2), (4), and (6) in Table 4. While the coefficient on *Share to Winner* is positive throughout, the relationship is highly statistically significant only in the superstar question. However, as discussed in Section 3.1, a small sub-group of spectators allocate a larger share of the earnings to the loser than to the winner, which we speculated might be due to confusion. Indeed, models (2), (5), and (8), restricting the analysis to this small sub-group of spectators, reveal an incoherent, reversed relationship between redistribution decisions and questionnaire responses. This corroborates the possibility that spectators in this sub-group were confused during the experiment and intended to allocate more earnings to the winner rather than the loser. Consequently, when we exclude this sub-group of potentially confused subjects, as done in Models (3), (6), and (9) of Table A.6, a coherent and highly significant relationship between the share of the earnings given to the winner and the spectators' attitudes emerges for all three questionnaire items. Recall from footnote 8 that we show in Online Appendix B that our results prevail in the sub-sample that excludes the spectators who allocate more to the loser than to the winner.

contributes to this debate by showing that many spectators accept the winner receiving all earnings. Notably, this finding prevails even when the loser's performance is almost the same as the winner's. The data thus reveal that the mere fact of winning, even by a tiny margin, is a major factor in justifying extreme income inequalities. Consequently, our findings more closely align with Mankiw's intuition on people's fairness views: "My sense is that people are rarely outraged when high incomes go to those who obviously earned them. (2010, p. 295).

Our results also contribute to understanding the political divide between Democrats and Republicans regarding support for redistributive policies. Our sample of the general U.S. population reflects this divide: while 72 percent of those who support Democrats believe that income taxes for the top one percent should be increased, only 44 percent of Republican supporters share this view. This difference may stem from distinct concepts of merit or differing views on the role of luck in the income of the top 1%. Our data reveal that Democrats and Republicans do not differ significantly in their redistributive choices within our experimental setting, where beliefs about the role of merit versus luck in earnings are controlled for. These observations suggest that Democrats and Republicans primarily disagree on the role of merit versus luck in the income of the top 1% outside the laboratory, with Democrats attributing a greater role to luck, a less accepted source of inequality.

Our paper makes a more general contribution by taking a step toward disentangling differing notions of merit. While it is an established finding that merit justifies inequality, winner-take-all competitions highlight varying policy implications of different *notions of merit*. Acceptance of extreme inequality and insensitivity to winning margins align with a *factual merit* view, which holds that the winner deserves their earnings because they are fully determined by their performance. Conversely, a *counterfactual merit* view posits that earnings should reflect the value added beyond the runner-up, leading to smaller shares when margins are small. Our data suggest people favor the factual merit view but do not explain why. Is there a fundamental objection to the counterfactual merit argument, or is the factual merit argument simply more salient in winner-take-all competitions? Given the significant implications for redistribution policy, it is crucial to further explore contrasting notions of merit, also in settings beyond winner-take-all competitions. These issues present promising avenues for future research.

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Table 1: Treatment Overview

	WTA	WTA-No Choice	WTA-No Exp.	Luck
Workers can choose reward structure	yes	no	no	no
Workers informed about reward structure	yes	yes	no	no
Earnings determined by performance	yes	yes	yes	no

Table 2: Regression Analysis: The Role of Merit for Inequality Acceptance

	All to winner				Share to winner			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
WTA Competition	0.156***	0.157***	0.164***	0.126***	0.116***	0.116***	0.117***	0.083***
	(0.015)	(0.015)	(0.019)	(0.026)	(0.010)	(0.010)	(0.013)	(0.017)
Republican		0.037**	0.033	0.052**		0.001	0.005	0.008
		(0.015)	(0.020)	(0.023)		(0.010)	(0.014)	(0.016)
College		0.036**	0.024	-0.022		0.022**	0.018	-0.002
		(0.014)	(0.020)	(0.022)		(0.010)	(0.013)	(0.015)
Female		-0.012	-0.027	-0.048**		0.011	-0.003	-0.024
		(0.014)	(0.019)	(0.022)		(0.009)	(0.013)	(0.015)
Above median age		0.105***	0.094***	0.064***		0.076***	0.069***	0.054***
		(0.014)	(0.019)	(0.021)		(0.009)	(0.013)	(0.015)
Constant	0.172***	0.085***	0.077***	0.129***	0.555***	0.496***	0.490***	0.512***
	(0.012)	(0.021)	(0.026)	(0.030)	(0.009)	(0.015)	(0.019)	(0.022)
Census area FE	No	Yes	Yes	Yes	No	Yes	Yes	Yes
N	4000	4000	2000	1400	4000	4000	2000	1400
adj. R^2	0.022	0.038	0.050	0.029	0.027	0.043	0.052	0.025

Notes: The table presents linear regression models examining the influence of winner-take-all competition on two dependent variables: *All to winner* (an indicator variable set to one if a spectator allocated all income to the winner) and *Share to winner* (the share of earnings allocated to the winner by a spectator). *WTA Competition* is an indicator variable that assumes a value of one for data derived from the three winner-take-all treatments. The Luck treatment serves as the omitted category. Models (1)-(2) and (5)-(6) include the entire sample; Models (3) and (7) control for earnings differences by limiting the sample to treatments WTA and Luck, i.e., excluding treatments WTA-No Choice and WTA-No Expectations; Models (4) and (8) include data from all three winner-take-all treatments but limit the analysis to the sub-sample with the smallest winning margin in the winner-take-all treatments. Control variables are *Republican* (1 if a spectator affiliates with the Republican party), *College* (1 if the spectator has obtained a four-year college degree or higher), *Female* (1 if the spectator is female), and *Above median age* (1 if the spectator is above the median age of 47). Robust standard errors in parentheses. ** $p < 0.05$, *** $p < 0.01$

Table 3: Regression Analysis: The Role of the Winning Margin for Inequality Acceptance

	All to winner			Share to winner		
	(1)	(2)	(3)	(4)	(5)	(6)
Winning margin	0.006***	0.006***	0.006***	0.006***	0.006***	0.006***
	(0.002)	(0.002)	(0.002)	(0.001)	(0.001)	(0.001)
Republican		0.037**	0.037**		-0.002	-0.002
		(0.018)	(0.018)		(0.012)	(0.012)
College		0.061***	0.061***		0.030***	0.030***
		(0.018)	(0.018)		(0.011)	(0.011)
Female		-0.001	-0.001		0.020	0.019
		(0.017)	(0.017)		(0.011)	(0.011)
Above median age		0.123***	0.123***		0.084***	0.084***
		(0.017)	(0.017)		(0.011)	(0.011)
Performance winner			0.000			-0.000
			(0.003)			(0.002)
Constant	0.293***	0.185***	0.179***	0.636***	0.572***	0.578***
	(0.014)	(0.025)	(0.053)	(0.009)	(0.017)	(0.034)
Census area FE	No	Yes	Yes	No	Yes	Yes
N	3000	3000	3000	3000	3000	3000
adj. R^2	-0.000	0.022	0.022	-0.000	0.019	0.019

Notes: The table presents linear regression models examining the influence of the winning margin in the three winner-take-all treatments on two dependent variables: *All to winner* (an indicator variable set to one if a spectator allocated all income to the winner) and *Share to winner* (the share of earnings allocated to the winner by a spectator). *Winning Margin* is the number of problems by which the winner outperformed the loser, ranging from 1 to 21. *Performance Winner* is the number of problems solved by the winner. Control variables are *Republican* (1 if a spectator affiliates with the Republican party), *College* (1 if the spectator has obtained a four-year college degree or higher), *Female* (1 if the spectator is female), and *Above median age* (1 if the spectator is above the median age of 47). Robust standard errors in parentheses. ** $p < 0.05$, *** $p < 0.01$

Table 4: Correlation Between Giving All to the Winner and General Attitudes

	Gold medalist		Superstar		Decrease tax on top 1%	
	(1)	(2)	(3)	(4)	(5)	(6)
All to winner	0.418***	0.378***	0.245***	0.222***	0.129***	0.133***
	(0.063)	(0.062)	(0.057)	(0.057)	(0.027)	(0.026)
Republican		0.533***		0.224***		0.229***
		(0.063)		(0.056)		(0.026)
College		0.271***		0.228***		-0.049*
		(0.060)		(0.054)		(0.025)
Female		-0.493***		-0.238***		0.050*
		(0.058)		(0.053)		(0.024)
Above median age		-0.024		-0.028		-0.073**
		(0.058)		(0.053)		(0.024)
Constant	3.861***	3.878***	5.148***	5.201***	1.488***	1.460***
	(0.036)	(0.082)	(0.032)	(0.071)	(0.015)	(0.034)
Census area FE	No	Yes	No	Yes	No	Yes
N	3000	3000	3000	3000	3000	3000
adj. R^2	0.014	0.071	0.006	0.024	0.008	0.037

Notes: The table reports the correlation coefficients between *All to winner* (indicator variable taking the value one if the spectator assigned all the income to the winner) and the three survey questions on general attitudes in the winner-take-all treatments: *Gold medalist*: "Olympic Gold medalists go on to receive millions of dollars in endorsements, while the runners-up are quickly forgotten—even when the performance gap is almost too small to be measured. Do you find this fair or unfair?" (scale 1-7, 1=Entirely unfair; 7=Entirely fair); *Superstar*: "When we see Steven Spielberg make blockbuster movies, Steve Jobs introduce the iPod, David Letterman crack funny jokes, and J.K Rowling excite countless young readers with her Harry Potter books, we don't object to the many millions of dollars they earn in the process. Do you agree with this statement?" (scale 1-7, 1=Fully disagree, 7=Fully agree); *Tax top 1%*: "Do you think income taxes on the top 1 percent income earners should be increased, stay the same, or decreased?" (scale 1-3, 1=Increase, 2=Stay the same, 3=Decrease). Control variables are *Republican* (1 if affiliates with Republican party), *College* (one if 4-year college degree or more), *Female* (one if female), *Above median age* (one if subject older than 47). Robust standard errors in parentheses. ** $p < 0.05$, *** $p < 0.01$

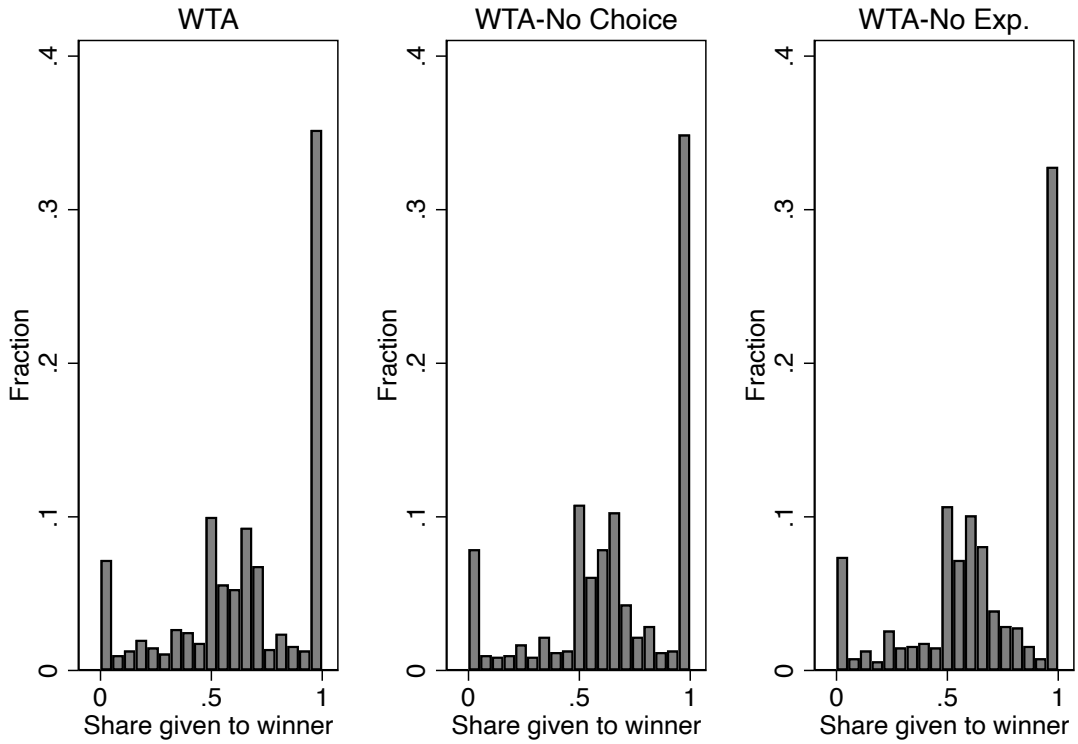


Figure 1: **Share of earnings given to winner.** The panels show the distribution of the share of the earnings assigned to the winner in the three winner-take-all treatments.

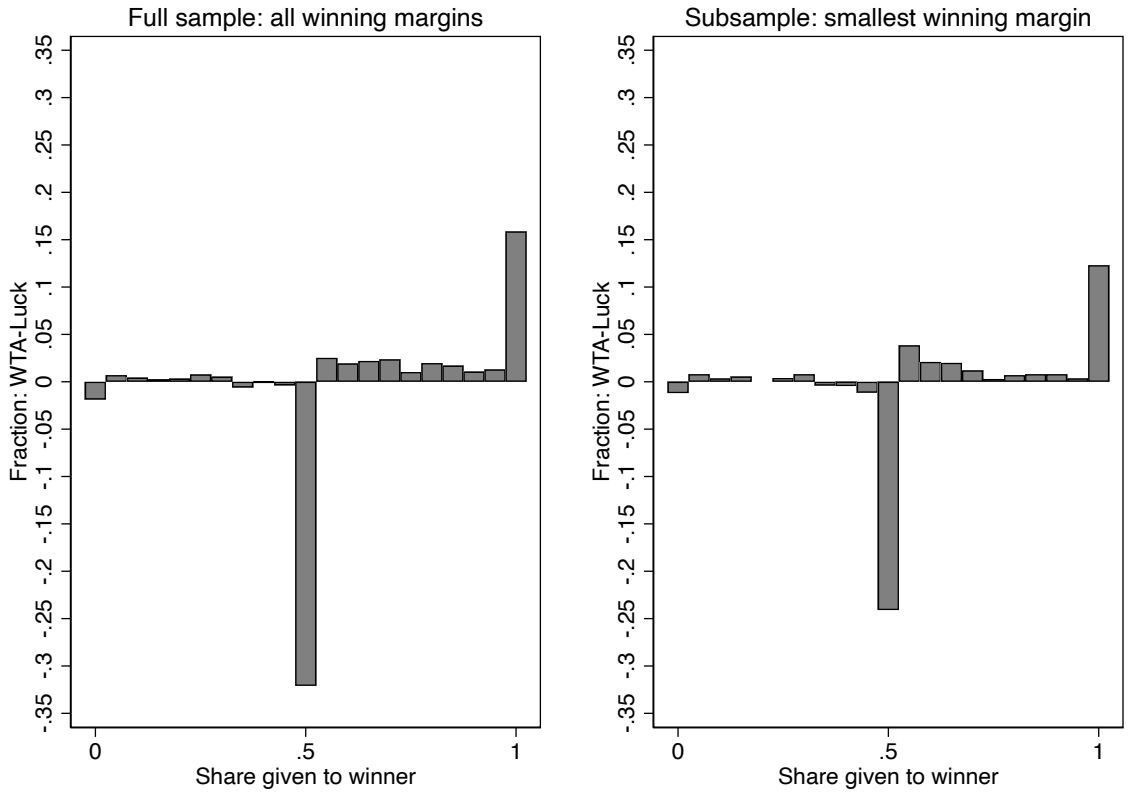


Figure 2: **Winner-Take-All vs. Luck.** The figure illustrates the distribution of the share of earnings allocated to the winner in the winner-take-all treatments, adjusted by subtracting the corresponding shares from the Luck treatment. Positive values indicate a higher proportion of spectators in the winner-take-all treatments assigning a specific share of the earnings to the winner, whereas negative values reflect a lower proportion.

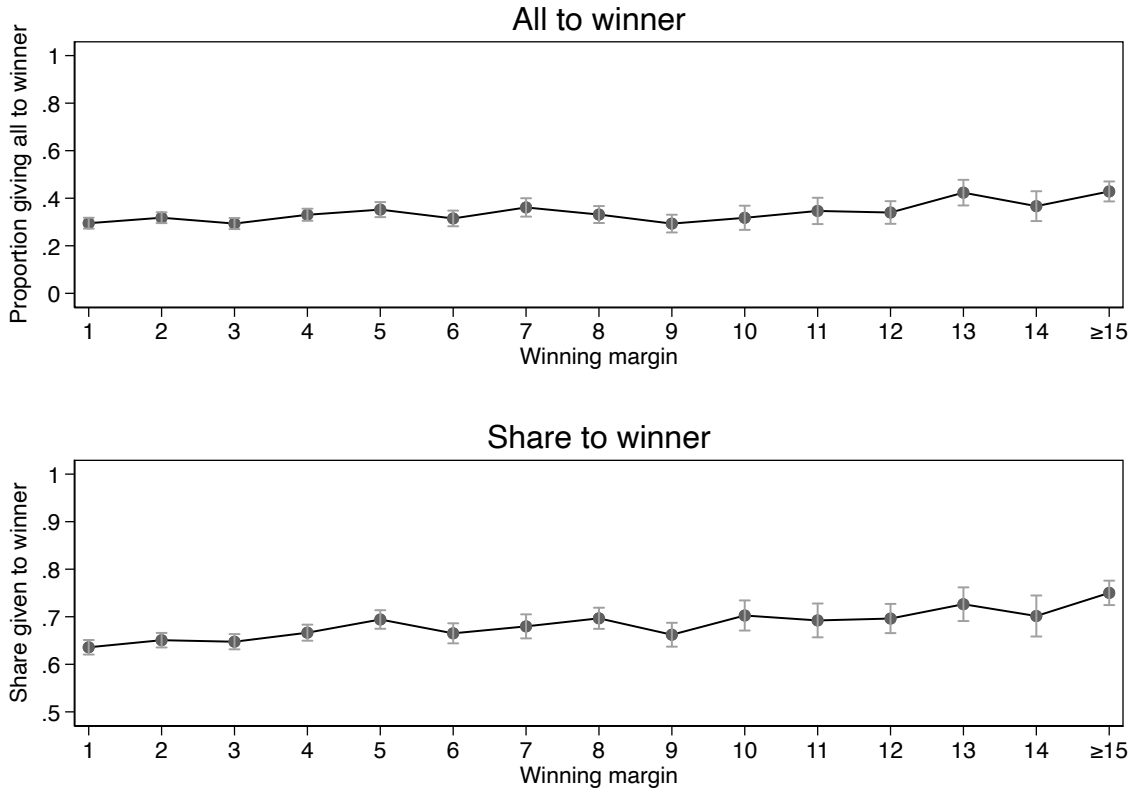


Figure 3: **Role of winning margin.** The figure illustrates the proportion of spectators who allocate all earnings to the winner (upper panel) and the share of the earnings allocated to the winner (lower panel) as a function of the performance difference between winner and loser in the winner-take-all treatments. Winning margins of 15 or greater, which occur in less than five percent of cases, are grouped together. Error bars show the standard errors of the means.

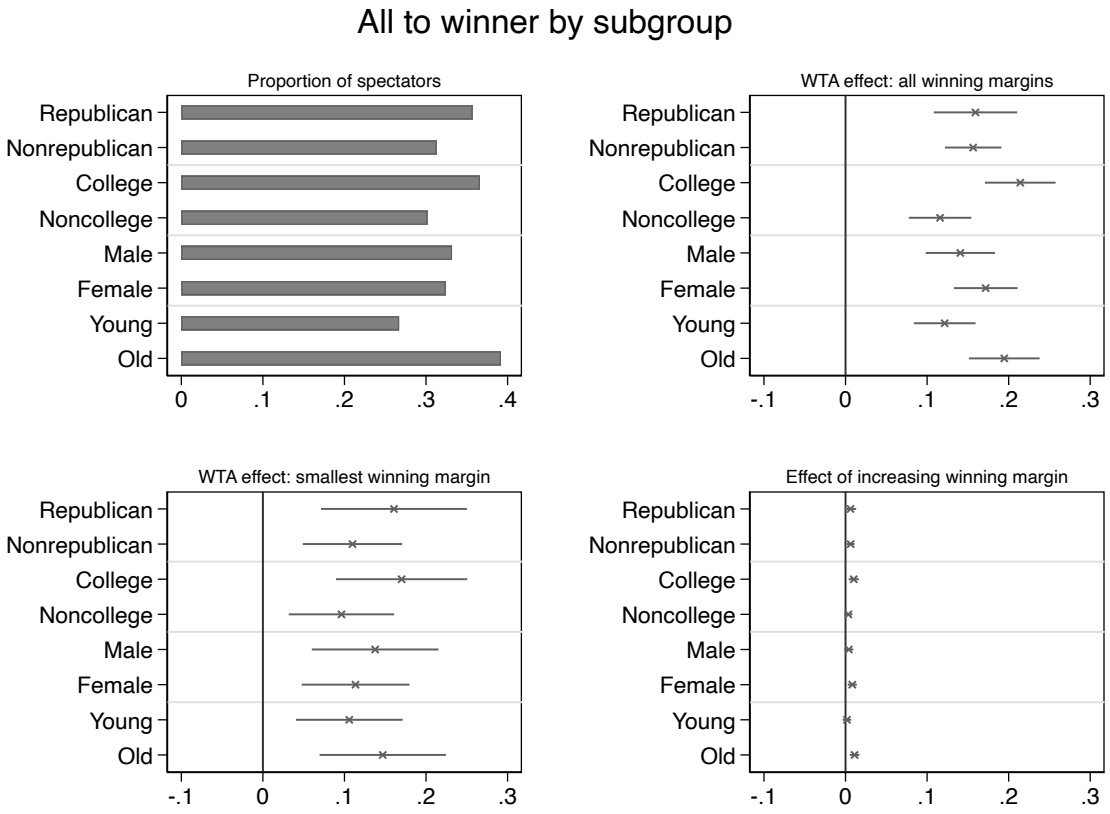


Figure 4: **Heterogeneity Analysis: All to winner.** The upper left panel displays the proportion of spectators in the different subgroups of the U.S. population who allocate all earnings to the winner. The upper right panel illustrates the effect of being assigned to a winner-take-all treatment, relative to being assigned to the Luck treatment, on the proportion of spectators who allocate all earnings to the winner. The lower left panel illustrates the effect when the analysis is restricted to cases with the minimal winning margin in the winner-take-all treatments. The lower right panel plots the average effect of increasing the winning margin in the winner-take-all treatments by one problem on the proportion of the spectators who allocate all earnings to the winner. Error bars show 95% confidence intervals.

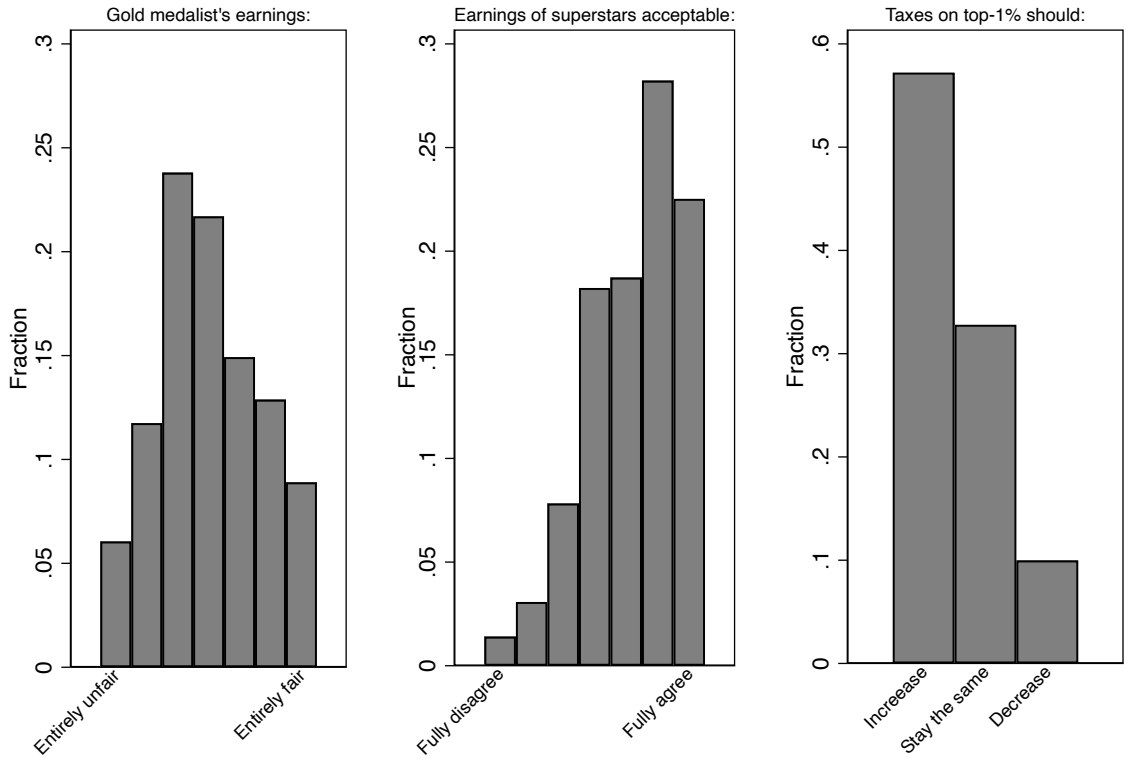


Figure 5: **Questionnaire Responses.** The figure shows the distribution of answers to three separate survey questions. Left panel: "Olympic Gold medalists go on to receive millions of dollars in endorsements, while the runners-up are quickly forgotten—even when the performance gap is almost too small to be measured. Do you find this fair or unfair?" (scale 1-7, 1=Entirely unfair; 7=Entirely fair). Mid panel: "When we see Steven Spielberg make blockbuster movies, Steve Jobs introduce the iPod, David Letterman crack funny jokes, and J.K. Rowling excite countless young readers with her Harry Potter books, we don't object to the many millions of dollars they earn in the process. Do you agree with this statement?" (scale 1-7, 1=Fully disagree, 7=Fully agree). Right panel: "Do you think income taxes on the top 1 percent income earners should be increased, stay the same, or decreased?" (scale 1-3, 1=Increase, 2=Stay the same, 3=Decrease).

A Online Appendix: Supplementary Tables and Figures

Table A.1: Sample Means

		Winner-take-all treatments				
	All	WTA	WTA-No Choice	WTA-No Exp.	Luck	F-test
Age	46.560	46.582	46.630	46.485	46.544	0.998
Female	0.514	0.514	0.514	0.514	0.514	1.000
Republican	0.341	0.339	0.335	0.342	0.346	0.962
Education	3.932	3.920	3.961	3.909	3.939	0.894
Taxes on top 1%	1.528	1.543	1.506	1.542	1.519	0.534
Gold medalist	3.981	3.932	4.031	4.042	3.918	0.200
Superstar	2.754	2.751	2.795	2.768	2.703	0.548
Census area:						
Midwest	0.210	0.210	0.210	0.210	0.210	1.000
Northeast	0.178	0.178	0.178	0.178	0.178	1.000
South	0.377	0.377	0.377	0.377	0.377	1.000
West	0.235	0.235	0.235	0.235	0.235	1.000
N	4000	1000	1000	1000	1000	4000

Notes: The table shows sample means for the following variables: Age (age of a spectators in years), Female (an indicator variable that is set to one if a spectator is female), Republican (an indicator variable that is set to one if a spectator self-identifies as Republican; Democrat and Independent being the other options), Education (1 = Less than high school, 2 = High school, 3 = Some college, 4 = 2-year college degree, 5 = 4-year college degree, 6 = Master's degree, 7 = Doctoral degree, 8 = Professional degree), Taxes on Top 1% (1 = Increase, 2 = Stay the same, 3 = Decrease), Gold Medalist (*"Olympic Gold medalists go on to receive millions of dollars in endorsements, while the runners-up are quickly forgotten–even when the performance gap is almost too small to be measured."* Do you find this fair or unfair? Scale of 1-7, where 1 = Entirely Fair and 7 = Entirely Unfair), Superstar (*"When we see Steven Spielberg make blockbuster movies, Steve Jobs introduce the iPod, David Letterman crack funny jokes, and J.K. Rowling excite countless young readers with her Harry Potter books, we don't object to the many millions of dollars they earn in the process."* Do you agree with this statement? Scale of 1-7, where 1 = Fully Agree and 7 = Fully Disagree), Census Area (an indicator variable taking the value one if a spectator resides in one of the four U.S. census regions: Midwest, Northeast, South, and West). F-test reports the p-value from a regression of the particular background variable on treatment indicator variables. For Age, Gender and Census area balance across treatment was enforced by quotas in the treatment assignment.

Table A.2: Regression Results: Comparison of Winner-Take-All Treatments

	All to winner			Share to winner		
	(1)	(2)	(3)	(4)	(5)	(6)
WTA-No Choice	0.001	-0.001	0.002	0.005	0.003	0.006
	(0.021)	(0.021)	(0.021)	(0.014)	(0.014)	(0.014)
WTA-No Exp.	-0.022	-0.020	-0.017	-0.008	-0.006	-0.004
	(0.021)	(0.021)	(0.021)	(0.014)	(0.014)	(0.014)
Republican		0.036**	0.037**		-0.003	-0.003
		(0.018)	(0.018)		(0.012)	(0.012)
College		0.062***	0.062***		0.031***	0.031***
		(0.018)	(0.018)		(0.011)	(0.011)
Female		-0.002	-0.002		0.019	0.019
		(0.017)	(0.017)		(0.011)	(0.011)
Above median age		0.122***	0.122***		0.083***	0.083***
		(0.017)	(0.017)		(0.011)	(0.011)
Performance winner			0.002			0.002
			(0.003)			(0.002)
Constant	0.335***	0.229***	0.189***	0.672***	0.609***	0.578***
	(0.015)	(0.025)	(0.059)	(0.010)	(0.017)	(0.038)
P: No Choice = No Exp.	0.272	0.352	0.352	0.378	0.480	0.480
Census area FE	No	Yes	Yes	No	Yes	Yes
N	3000	3000	3000	3000	3000	3000
adj. R^2	-0.000	0.022	0.022	-0.000	0.019	0.019

Notes: The table reports linear regressions of the variables *All to winner* (an indicator variable that is set to one if a spectator allocated all earnings to the winner) and *Share to winner* (share of earnings allocated to the winner by a spectator) on dummy variables for the WTA-No Choice and WTA-No Expectations treatments (the WTA treatment is the omitted category). Control variables are *Republican* (1 if a spectator affiliates with the Republican party), *College* (1 if the spectator has obtained a four-year college degree or higher), *Female* (1 if the spectator is female), and *Above median age* (1 if the spectator is above the median age of 47). *Performance Winner* is the number of problems solved by the winner. Robust standard errors in parentheses. ** $p < 0.05$, *** $p < 0.01$

Table A.3: Heterogeneous Treatment Effects of the Role of Merit for Inequality Acceptance: All to winner

	Full sample				Smallest winning margin			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
WTA Competition	0.156***	0.116***	0.141***	0.122***	0.111***	0.097***	0.137***	0.109***
	(0.018)	(0.020)	(0.022)	(0.019)	(0.031)	(0.033)	(0.040)	(0.033)
WTA Competition×Republican	0.001				0.044			
	(0.031)				(0.055)			
WTA Competition×College		0.098***				0.072		
		(0.029)				(0.052)		
WTA Competition×Female			0.031				-0.020	
			(0.029)				(0.052)	
WTA Competition×Above Median Age				0.072**				0.038
				(0.029)				(0.052)
Constant	0.085***	0.115***	0.097***	0.111***	0.132***	0.137***	0.126***	0.134***
	(0.022)	(0.023)	(0.024)	(0.023)	(0.030)	(0.030)	(0.031)	(0.030)
Lincom: WTA + WTA×X	0.158***	0.214***	0.172***	0.194***	0.154***	0.169***	0.117***	0.147***
	(0.026)	(0.022)	(0.020)	(0.022)	(0.045)	(0.041)	(0.034)	(0.040)
Census area FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Control variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	4000	4000	4000	4000	1400	1400	1400	1400
adj. R^2	0.038	0.040	0.038	0.039	0.029	0.030	0.028	0.029

Notes: The table presents linear regression models examining the influence of winner-take-all competition on the dependent variable *All to winner* (an indicator variable set to one if a spectator allocated all income to the winner). *WTA Competition* is an indicator variable that assumes a value of one for data derived from the three winner-take-all treatments. The Luck treatment serves as the omitted category. *WTA Competition* is interacted separately with four dummy variables: *Republican* (1 if a spectator affiliates with the Republican party), *College* (1 if the spectator has obtained a four-year college degree or higher), *Female* (1 if the spectator is female), *Above median age* (1 if the spectator is above the median age of 47). All regressions also control for the main effects of the four dummy variables and census area fixed effects. Models (1)-(4) include the entire sample; Models (5)-(8) limit the analysis to the sub-sample with the smallest winning margin in the winner-take-all treatments. Robust standard errors in parentheses. ** $p < 0.05$, *** $p < 0.01$

Table A.4: Heterogeneous Treatment Effects of the Role of Merit for Inequality Acceptance: Share to winner

	Full sample				Smallest winning margin			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
WTA Competition	0.122***	0.103***	0.101***	0.101***	0.091***	0.078***	0.103***	0.084***
	(0.012)	(0.014)	(0.015)	(0.015)	(0.021)	(0.023)	(0.026)	(0.024)
WTA Competition×Republican	-0.017				-0.023			
	(0.022)				(0.038)			
WTA Competition×College		0.030				0.014		
		(0.020)				(0.035)		
WTA Competition×Female			0.029				-0.036	
			(0.020)				(0.035)	
WTA Competition×Above Median Age				0.030				-0.002
				(0.020)				(0.035)
Constant	0.492***	0.505***	0.507***	0.507***	0.510***	0.513***	0.506***	0.511***
	(0.016)	(0.016)	(0.017)	(0.017)	(0.022)	(0.022)	(0.022)	(0.022)
Lincom: WTA + WTA×X	0.105***	0.134***	0.130***	0.132***	0.068**	0.092***	0.067***	0.082***
	(0.018)	(0.015)	(0.014)	(0.014)	(0.032)	(0.027)	(0.023)	(0.026)
Census area FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Control variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	4000	4000	4000	4000	1400	1400	1400	1400
adj. R^2	0.043	0.044	0.044	0.044	0.025	0.025	0.025	0.025

Notes: The table presents linear regression models examining the influence of winner-take-all competition on the dependent variable *Share to winner* (the share of earnings allocated to the winner by a spectator). *WTA Competition* is an indicator variable that assumes a value of one for data derived from the three winner-take-all treatments. The Luck treatment serves as the omitted category. *WTA Competition* is interacted separately with four dummy variables: *Republican* (1 if a spectator affiliates with the Republican party), *College* (1 if the spectator has obtained a four-year college degree or higher), *Female* (1 if the spectator is female), *Above median age* (1 if the spectator is above the median age of 47). All regressions also control for the main effects of the four dummy variables and census area fixed effects. Models (1)-(4) include the entire sample; Models (5)-(8) limit the analysis to the sub-sample with the smallest winning margin in the winner-take-all treatments. Robust standard errors in parentheses. ** $p < 0.05$, *** $p < 0.01$

Table A.5: Heterogeneous Treatment Effects of the Role of the Winning Margin

	All to winner				Share to winner			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Winning margin	0.006**	0.003	0.004	0.002	0.006***	0.005***	0.004**	0.004
	(0.002)	(0.003)	(0.003)	(0.003)	(0.002)	(0.002)	(0.002)	(0.002)
Winning margin×Republican	-0.000				0.001			
	(0.004)				(0.003)			
Winning margin×College		0.007				0.004		
		(0.004)				(0.003)		
Winning margin×Female			0.004				0.004	
			(0.004)				(0.003)	
Winning margin×Above Median Age				0.010**				0.006**
				(0.004)				(0.003)
Constant	0.185***	0.200***	0.198***	0.212***	0.574***	0.581***	0.584***	0.587***
	(0.027)	(0.027)	(0.028)	(0.027)	(0.018)	(0.018)	(0.019)	(0.019)
Lincom: Winning margin + Winning margin×X	0.006	0.010***	0.008***	0.011***	0.007***	0.009***	0.008***	0.009***
	(0.004)	(0.003)	(0.003)	(0.003)	(0.002)	(0.002)	(0.002)	(0.002)
Census area FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Control variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	3000	3000	3000	3000	3000	3000	3000	3000
adj. R^2	0.025	0.025	0.025	0.026	0.027	0.027	0.027	0.028

Notes: The table presents linear regression models examining the influence of the winning margin in the three winner-take-all treatments on two dependent variables: *All to winner* (an indicator variable set to one if a spectator allocated all income to the winner) and *Share to winner* (the share of earnings allocated to the winner by a spectator). *Winning Margin* is the number of problems by which the winner outperformed the loser, ranging from 1 to 21. *Winning Margin* is interacted separately with four dummy variables: *Republican* (1 if a spectator affiliates with the Republican party), *College* (1 if the spectator has obtained a four-year college degree or higher), *Female* (1 if the spectator is female), *Above median age* (1 if the spectator is above the median age of 47). All regressions also control for the main effects of the four dummy variables and census area fixed effects. Robust standard errors in parentheses. ** $p < 0.05$, *** $p < 0.01$

Table A.6: Correlation Between Share Given to the Winner and General Attitudes

	Gold medalist			Superstar			Decrease tax on top 1%		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Share to winner	0.172	-0.836**	1.140***	0.299***	-0.293	0.432***	0.078	-0.022	0.288***
	(0.100)	(0.411)	(0.162)	(0.087)	(0.335)	(0.152)	(0.040)	(0.166)	(0.068)
Republican	0.548***	0.532***	0.505***	0.233***	0.111	0.253***	0.234***	0.017	0.285***
	(0.063)	(0.145)	(0.069)	(0.056)	(0.124)	(0.063)	(0.026)	(0.056)	(0.029)
College	0.289***	0.066	0.320***	0.233***	0.287**	0.213***	-0.044	-0.046	-0.038
	(0.060)	(0.148)	(0.064)	(0.054)	(0.126)	(0.060)	(0.025)	(0.057)	(0.027)
Female	-0.497***	-0.357**	-0.498***	-0.243***	-0.287**	-0.230***	0.049**	0.171***	0.025
	(0.059)	(0.143)	(0.064)	(0.053)	(0.119)	(0.060)	(0.024)	(0.056)	(0.027)
Above median age	0.008	-0.548***	0.146**	-0.026	-0.224	0.021	-0.063***	-0.111	-0.056**
	(0.059)	(0.146)	(0.063)	(0.054)	(0.126)	(0.059)	(0.024)	(0.057)	(0.027)
Constant	3.857***	4.569***	2.938***	5.068***	5.338***	4.921***	1.442***	1.574***	1.251***
	(0.102)	(0.192)	(0.154)	(0.087)	(0.154)	(0.142)	(0.041)	(0.078)	(0.064)
Census area FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	3000	606	2394	3000	606	2394	3000	606	2394
adj. R^2	0.061	0.065	0.088	0.023	0.024	0.022	0.029	0.015	0.047

Notes: The table reports the correlation coefficients between *Share to winner* (the share of earnings allocated to the winner by a spectator) and the three survey questions on general attitudes in the winner-take-all treatments: *Gold medalist*: "Olympic Gold medalists go on to receive millions of dollars in endorsements, while the runners-up are quickly forgotten—even when the performance gap is almost too small to be measured. Do you find this fair or unfair?" (scale 1-7, 1=Entirely unfair; 7=Entirely fair); *Superstar*: "When we see Steven Spielberg make blockbuster movies, Steve Jobs introduce the iPod, David Letterman crack funny jokes, and J.K Rowling excite countless young readers with her Harry Potter books, we don't object to the many millions of dollars they earn in the process. Do you agree with this statement?" (scale 1-7, 1=Fully disagree, 7=Fully agree); *Tax top 1%*: "Do you think income taxes on the top 1 percent income earners should be increased, stay the same, or decreased?" (scale 1-3, 1=Increase, 2=Stay the same, 3=Decrease). Control variables are *Republican* (1 if affiliates with Republican party), *College* (one if 4-year college degree or more), *Female* (one if female), *Above median age* (one if subject older than 47). Models (1), (4) and (7) include the entire sample; Models (2), (5) and (8) include only spectators who give a strictly larger share of the earnings to the loser; Models (3), (6) and (9) include only spectators who give a weakly larger share of the earnings to the winner. Robust standard errors in parentheses. ** $p < 0.05$, *** $p < 0.01$

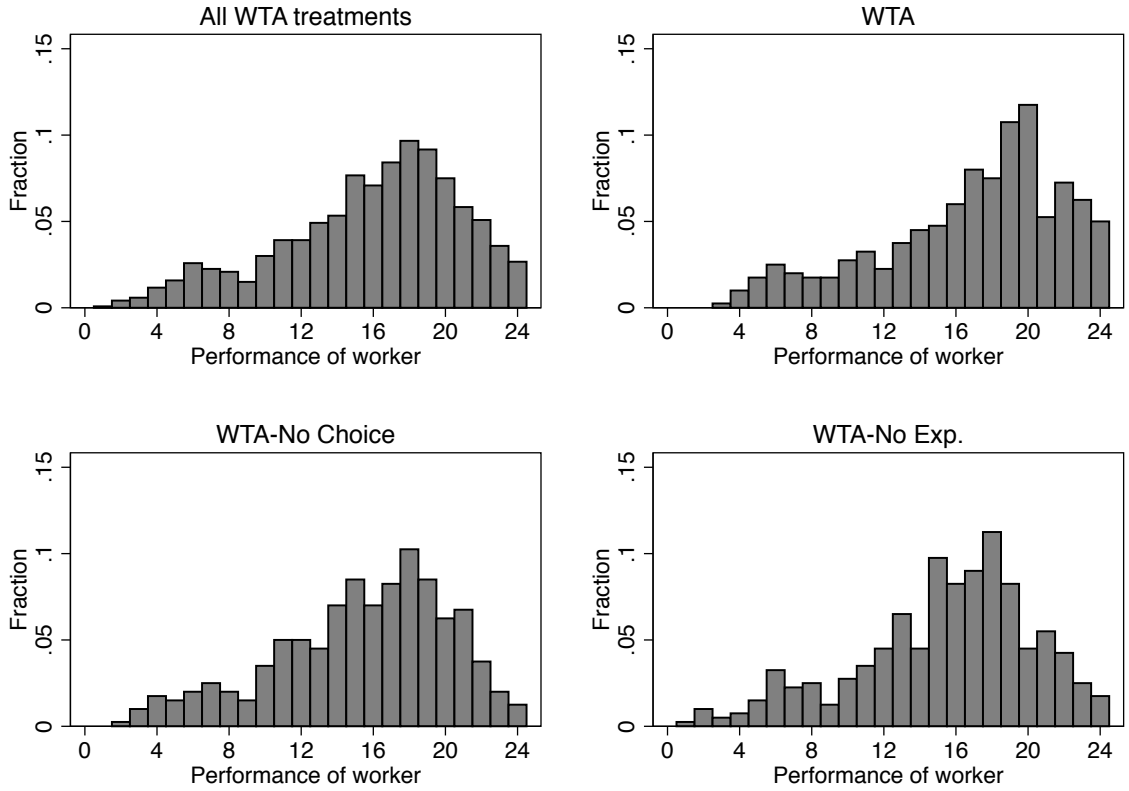


Figure A.1: **Performance of workers by treatment.** The figure shows the numbers of problems solved by the workers in each of the three winner-take-all treatments separately, as well as pooled over all three treatments.

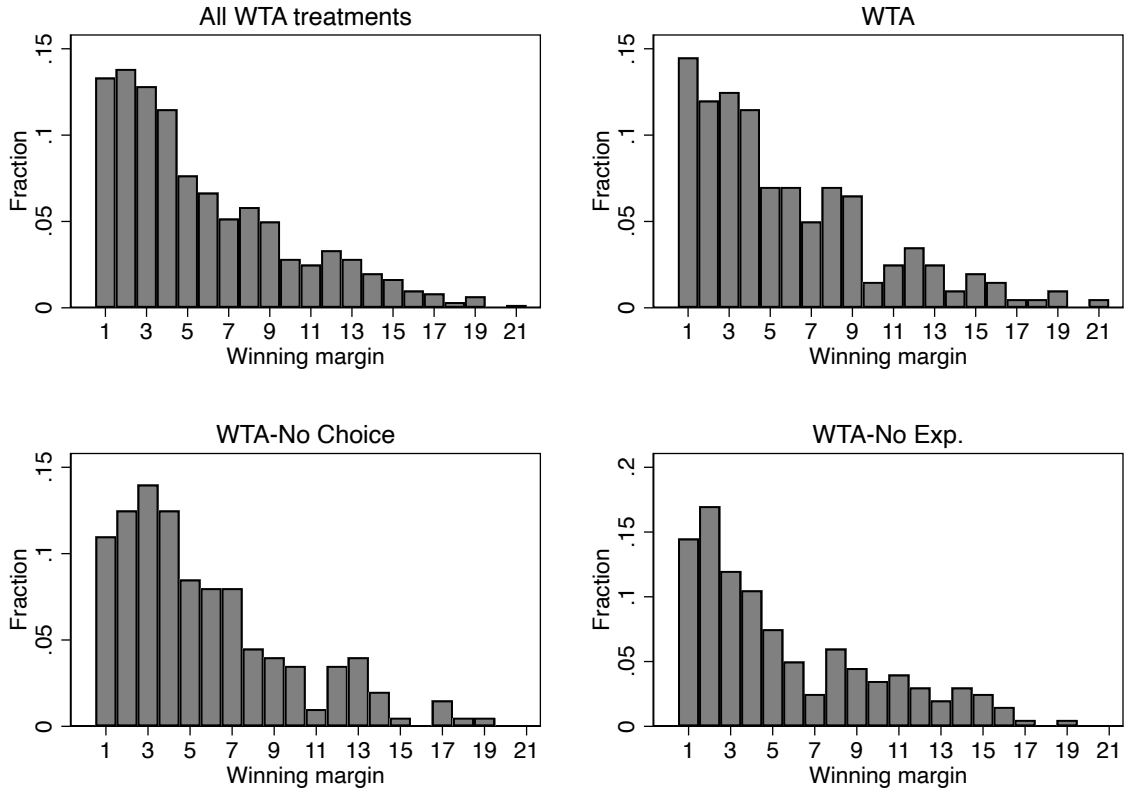


Figure A.2: **Winning margin by treatment.** The figure shows the differences in the numbers of problems solved within the worker pairs in each of the three winner-take-all treatments separately, as well as pooled over all three treatments.

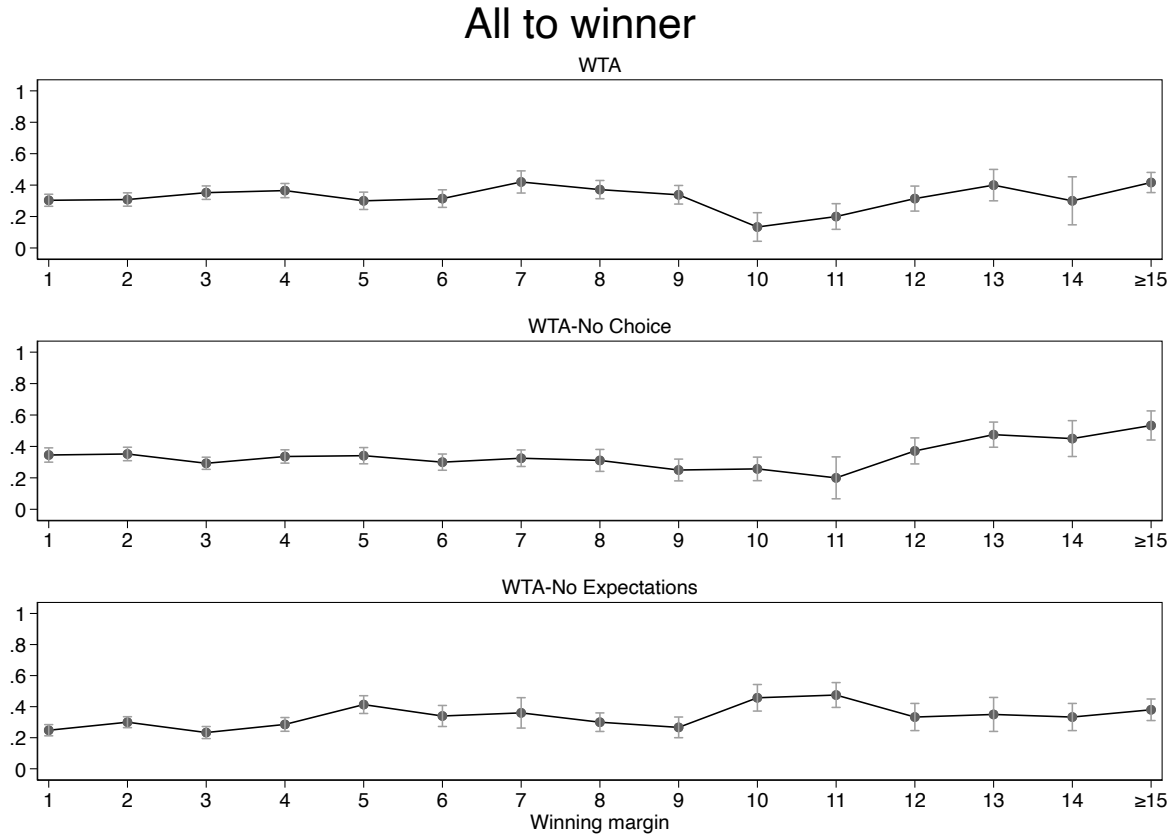


Figure A.3: **Role of winning margin by treatment.** The figure illustrates the proportion of spectators who allocate all earnings to the winner as a function of the performance difference between winner and loser in the three winner-take-all treatments separately. Winning margins of 15 or greater, which occur in less than five percent of cases in the three treatments, are grouped together. Error bars show the standard errors of the means.

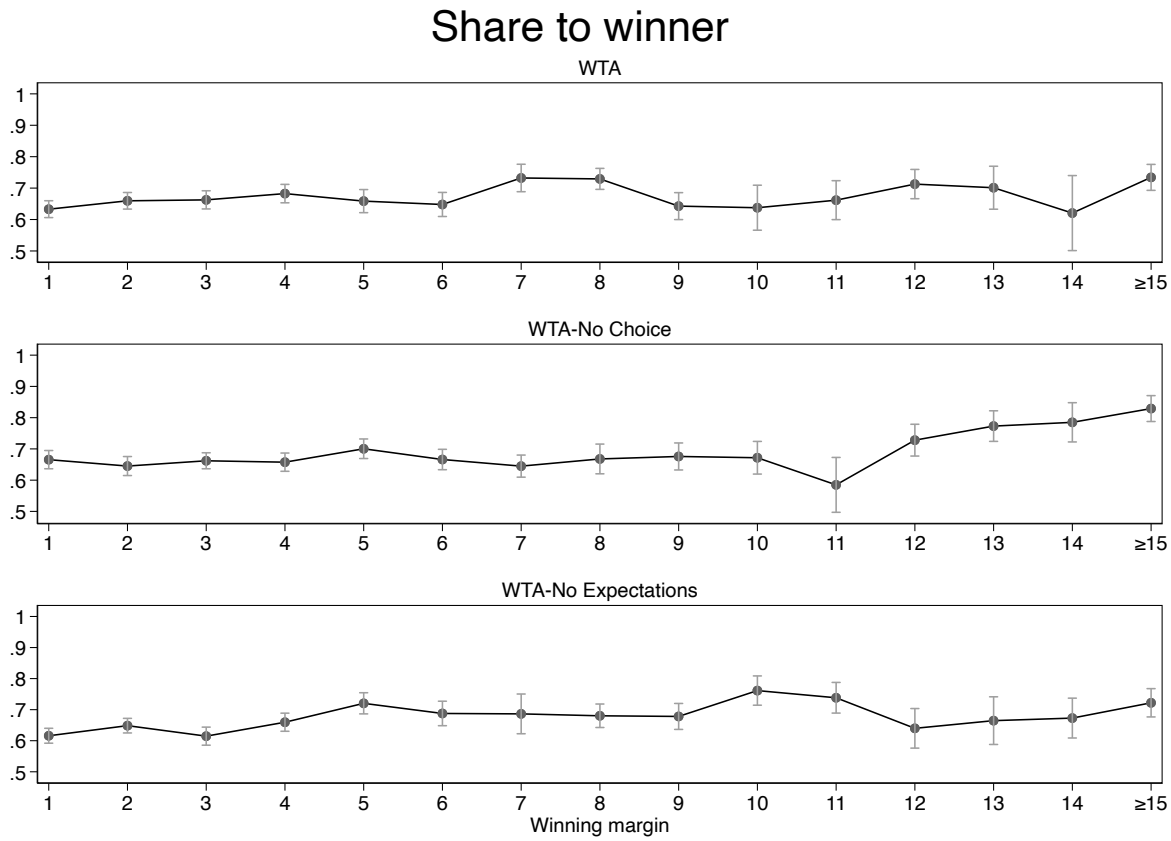


Figure A.4: **Role of winning margin by treatment.** The figure illustrates the share of the earnings given to the winner as a function of the performance difference between the winner and the loser in the three winner-take-all treatments separately. Winning margins of 15 or greater, which occur in less than five percent of cases in the three treatments, are grouped together. Error bars show the standard errors of the means.

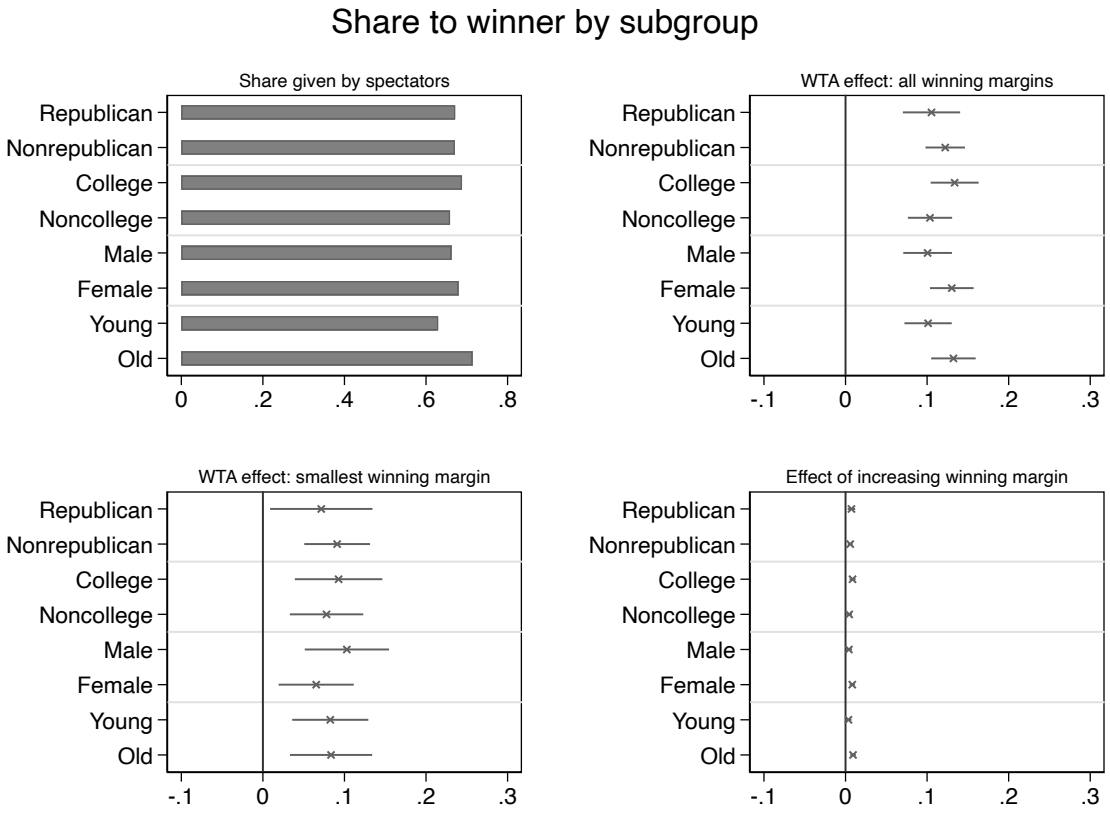


Figure A.5: **Heterogeneity Analysis: Share to winner.** The upper left panel displays the share of the earnings allocated to the winner in the different subgroups of the U.S. population. The upper right panel illustrates the effect of being assigned to a winner-take-all treatment, relative to being assigned to the Luck treatment, on the share of the earnings allocated to the winner. The lower left panel illustrates the effect when the analysis is restricted to cases with the minimal winning margin in the winner-take-all treatments. The lower right panel plots the average effect of increasing the winning margin in the winner-take-all treatments by one problem on the share of the earnings allocated to the winner. Error bars show 95% confidence intervals.

B Online Appendix: Restricted Sample

In this appendix, we provide a robustness check by restricting the analysis to the sub-sample of spectators who allocate a weakly larger share of the earnings to the winner. We find that our results replicate in this restricted sample.

Models (1) and (4) in Table B.1 correspond to models (1) and (4) in Table A.2. The constant terms reveal that the proportion of spectators who do not redistribute at all and the share of the earnings allocated to the winner—43 and 80 percent, respectively—are larger in the restricted sample compared to the full sample. This finding is a direct consequence of excluding spectators who allocate a larger share of the earnings to the loser rather than to the winner. The results replicate Result 1 in the main paper and suggest that our estimates of inequality acceptance, as reported in the main paper, might be biased downwards due to the presence of potentially inattentive subjects.[21]

Models (2) and (5) in Table B.1 correspond to models (2) and (6) in Table 2. The highly significant coefficients on *WTA Competition* replicate Result 2. Notably, the coefficients on *WTA Competition* are even larger in the restricted sample than in the full sample.

Models (3) and (6) in Table B.1 correspond to models (2) and (6) in Table 3. The coefficients on *Winning margin* are small in the restricted sample as well, particularly relative to the impact of merit, as identified by the coefficient on *WTA Competition* in models (2) and (5) in Table B.1. These findings replicate Result 3.

Tables B.2, B.3, and B.4, replicate the heterogeneity analysis in Tables A.3, A.4, and A.5. The analysis reveals that our findings regarding the proportion of spectators not engaging in redistribution, the share of the earnings allocated to the winner, and the impact of the winning margin are consistently observed across all examined subgroups in the restricted sample.

Finally, models (1), (3), and (5) in Table B.5 replicate models (2), (4) and (6) in Table 4. Models (2), (4), and (6) in Table B.5 are identical to models (3), (6), and (9) in Table A.6 and included only for convenience. In the restricted sample, we find a coherent and highly statistically significant relationship between the spectators' redistribution decisions in the experiment and their questionnaire responses in all six cases.

[21] Models (1) and (4) also show that, as in the full sample, the spectators' redistribution decisions are very similar across the winner-take-all treatments. While the share of earnings allocated to the winner is significantly smaller in the WTA-No Expectations treatment compared to the WTA treatment, the two-percentage-point difference is minor, given that 80 percent of the earnings are allocated to the winner in the WTA treatment.

Table B.1: Replication of Main Results: Restricted Sample

	All to winner			Share to winner		
	(1)	(2)	(3)	(4)	(5)	(6)
WTA-No Choice	-0.015			-0.011		
	(0.025)			(0.010)		
WTA-No Exp.	-0.038			-0.021**		
	(0.025)			(0.010)		
WTA Competition		0.192***			0.140***	
		(0.018)			(0.008)	
Winning margin			0.007***			0.006***
			(0.002)			(0.001)
Constant	0.429***	0.149***	0.277***	0.803***	0.642***	0.737***
	(0.018)	(0.027)	(0.030)	(0.007)	(0.012)	(0.012)
Census area FE	No	Yes	Yes	No	Yes	Yes
Control variables	No	Yes	Yes	No	Yes	Yes
N	2394	3168	2394	2394	3168	2394
adj. R^2	0.000	0.041	0.022	0.001	0.090	0.029

Notes: Models (1) and (4) report linear regressions of the variables *All to winner* (an indicator variable that is set to one if a spectator allocated all earnings to the winner) and *Share to winner* (share of earnings allocated to the winner by a spectator), respectively, on dummy variables for the WTA-No Choice and WTA-No Expectations treatments. The WTA treatment serves as the omitted category. Models (2) and (5) present linear regression models examining the influence of winner-take-all competition on *All to winner* and *Share to winner*, respectively. The Luck treatment serves as the omitted category. Models (3) and (6) present linear regression models examining the influence of the winning margin in the three winner-take-all treatments on *All to winner* and *Share to winner*, respectively. *WTA Competition* is an indicator variable that assumes a value of one for data derived from the three winner-take-all treatments. *Winning Margin* is the number of problems by which the winner outperformed the loser, ranging from 1 to 21. Control variables are *Republican* (1 if a spectator affiliates with the Republican party), *College* (1 if the spectator has obtained a four-year college degree or higher), *Female* (1 if the spectator is female), and *Above median age* (1 if the spectator is above the median age of 47). Robust standard errors in parentheses. ** $p < 0.05$, *** $p < 0.01$

Table B.2: Heterogeneous Treatment Effects on All to winner: Restricted Sample

	Full sample				Smallest winning margin			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
WTA Competition	0.185***	0.140***	0.182***	0.154***	0.114***	0.106***	0.160***	0.123***
	(0.022)	(0.024)	(0.027)	(0.026)	(0.036)	(0.040)	(0.047)	(0.042)
WTA Competition×Republican	0.020				0.115			
	(0.038)				(0.067)			
WTA Competition×College		0.120***				0.113		
		(0.036)				(0.062)		
WTA Competition×Female			0.019				-0.016	
			(0.036)				(0.062)	
WTA Competition×Above median age				0.072**				0.060
				(0.036)				(0.061)
Constant	0.154***	0.187***	0.156***	0.177***	0.196***	0.201***	0.186***	0.198***
	(0.028)	(0.029)	(0.030)	(0.029)	(0.038)	(0.038)	(0.039)	(0.039)
Lincom: WTA + WTA×X	0.205***	0.260***	0.201***	0.226***	0.229***	0.219***	0.145***	0.182***
	(0.032)	(0.026)	(0.024)	(0.025)	(0.056)	(0.048)	(0.040)	(0.045)
Census area FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Control variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	3168	3168	3168	3168	1095	1095	1095	1095
adj. R^2	0.041	0.044	0.041	0.042	0.037	0.037	0.034	0.034

Notes: The table presents linear regression models examining the influence of winner-take-all competition on the dependent variable *All to winner* (an indicator variable set to one if a spectator allocated all income to the winner) for the restricted sample of spectators who allocate a weakly large share of the earnings to the winner. *WTA Competition* is an indicator variable that assumes a value of one for data derived from the three winner-take-all treatments. The Luck treatment serves as the omitted category. *WTA Competition* is interacted separately with four dummy variables: *Republican* (1 if a spectator affiliates with the Republican party), *College* (1 if the spectator has obtained a four-year college degree or higher), *Female* (1 if the spectator is female), *Above median age* (1 if the spectator is above the median age of 47). All regressions also control for the main effects of the four dummy variables and census area fixed effects. Models (1)-(4) include the entire sample; Models (5)-(8) limit the analysis to the sub-sample with the smallest winning margin in the winner-take-all treatments. Robust standard errors in parentheses. ** $p < 0.05$, *** $p < 0.01$

Table B.3: Heterogeneous Treatment Effects on Share to winner: Restricted Sample

	Full sample				Smallest winning margin			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
WTA Competition	0.138***	0.118***	0.129***	0.122***	0.079***	0.080***	0.103***	0.079***
	(0.010)	(0.011)	(0.012)	(0.012)	(0.017)	(0.018)	(0.020)	(0.019)
WTA Competition×Republican	0.005				0.059**			
	(0.017)				(0.029)			
WTA Competition×College		0.052***				0.045		
		(0.016)				(0.028)		
WTA Competition×Female			0.021				-0.008	
			(0.016)				(0.027)	
WTA Competition×Above median age				0.035**				0.041
				(0.016)				(0.027)
Constant	0.643***	0.659***	0.650***	0.656***	0.661***	0.662***	0.656***	0.663***
	(0.012)	(0.013)	(0.013)	(0.013)	(0.018)	(0.018)	(0.018)	(0.018)
Lincom: WTA + WTA×X	0.143***	0.169***	0.150***	0.156***	0.138***	0.126***	0.095***	0.120***
	(0.014)	(0.012)	(0.011)	(0.012)	(0.023)	(0.021)	(0.018)	(0.020)
Census area FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Control variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	3168	3168	3168	3168	1095	1095	1095	1095
adj. R^2	0.089	0.092	0.090	0.091	0.065	0.063	0.061	0.063

Notes: The table presents linear regression models examining the influence of winner-take-all competition on the dependent variable *Share to winner* (the share of earnings allocated to the winner by a spectator) for the restricted sample of spectators who allocate a weakly large share of the earnings to the winner. *WTA Competition* is an indicator variable that assumes a value of one for data derived from the three winner-take-all treatments. The Luck treatment serves as the omitted category. *WTA Competition* is interacted separately with four dummy variables: *Republican* (1 if a spectator affiliates with the Republican party), *College* (1 if the spectator has obtained a four-year college degree or higher), *Female* (1 if the spectator is female), *Above median age* (1 if the spectator is above the median age of 47). All regressions also control for the main effects of the four dummy variables and census area fixed effects. Models (1)-(4) include the entire sample; Models (5)-(8) limit the analysis to the sub-sample with the smallest winning margin in the winner-take-all treatments. Robust standard errors in parentheses. ** $p < 0.05$, *** $p < 0.01$

Table B.4: Heterogeneous Treatment Effects of the Role of the Winning Margin: Restricted Sample

	All to winner				Share to winner			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Winning margin	0.008***	0.005	0.004	0.002	0.007***	0.006***	0.004***	0.005***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.001)	(0.001)	(0.001)	(0.001)
Winning margin×Republican	-0.004				-0.003			
	(0.005)				(0.002)			
Winning margin×College		0.005				0.002		
		(0.005)				(0.002)		
Winning margin×Female			0.005				0.004**	
			(0.005)				(0.002)	
Winning margin×Above median age				0.009				0.003
				(0.005)				(0.002)
Constant	0.270***	0.289***	0.294***	0.304***	0.731***	0.741***	0.750***	0.746***
	(0.032)	(0.032)	(0.034)	(0.033)	(0.013)	(0.013)	(0.013)	(0.013)
Lincom: Winning margin + Winning margin×X	0.005	0.010***	0.010***	0.011***	0.004***	0.007***	0.008***	0.008***
	(0.004)	(0.004)	(0.003)	(0.003)	(0.002)	(0.001)	(0.001)	(0.001)
Census area FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Control variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	2394	2394	2394	2394	2394	2394	2394	2394
adj. R^2	0.021	0.022	0.022	0.023	0.029	0.029	0.031	0.030

Notes: The table presents linear regression models examining the influence of the winning margin in the three winner-take-all treatments on two dependent variables: *All to winner* (an indicator variable set to one if a spectator allocated all income to the winner) and *Share to winner* (the share of earnings allocated to the winner by a spectator) for the restricted sample of spectators who allocate a weakly large share of the earnings to the winner. *Winning Margin* is the number of problems by which the winner outperformed the loser, ranging from 1 to 21. *Winning Margin* is interacted separately with four dummy variables: *Republican* (1 if a spectator affiliates with the Republican party), *College* (1 if the spectator has obtained a four-year college degree or higher), *Female* (1 if the spectator is female), *Above median age* (1 if the spectator is above the median age of 47). All regressions also control for the main effects of the four dummy variables and census area fixed effects. Robust standard errors in parentheses. ** $p < 0.05$, *** $p < 0.01$

Table B.5: Correlation Between Redistribution Decisions and General Attitudes: Restricted Sample

	Gold medalist		Superstar		Decrease tax on top 1%	
	(1)	(2)	(3)	(4)	(5)	(6)
All to winner	0.462***		0.190***		0.151***	
	(0.065)		(0.061)		(0.028)	
Share to winner		1.140***		0.432***		0.288***
		(0.162)		(0.152)		(0.068)
Constant	3.673***	2.938***	5.194***	4.921***	1.426***	1.251***
	(0.093)	(0.154)	(0.084)	(0.142)	(0.039)	(0.064)
Census area FE	Yes	Yes	Yes	Yes	Yes	Yes
Control variables	Yes	Yes	Yes	Yes	Yes	Yes
N	2394	2394	2394	2394	2394	2394
adj. R^2	0.088	0.088	0.023	0.022	0.052	0.047

Notes: The table reports the correlation coefficients between the two variables *All to winner* (indicator variable taking the value one if the spectator assigned all the income to the winner), respectively *Share to winner* (the share of earnings allocated to the winner by a spectator), and the answers to three survey questions on general attitudes for the restricted sample of spectators who allocate a weakly large share of the earnings to the winner in the winner-take-all treatments: *Gold medalist*: "Olympic Gold medalists go on to receive millions of dollars in endorsements, while the runners-up are quickly forgotten—even when the performance gap is almost too small to be measured. Do you find this fair or unfair?" (scale 1-7, 1=Entirely unfair; 7=Entirely fair); *Superstar*: "When we see Steven Spielberg make blockbuster movies, Steve Jobs introduce the iPod, David Letterman crack funny jokes, and J.K Rowling excite countless young readers with her Harry Potter books, we don't object to the many millions of dollars they earn in the process. Do you agree with this statement?" (scale 1-7, 1=Fully disagree, 7=Fully agree); *Tax top 1%*: "Do you think income taxes on the top 1 percent income earners should be increased, stay the same, or decreased?" (scale 1-3, 1=Increase, 2=Stay the same, 3=Decrease). Control variables are *Republican* (1 if affiliates with Republican party), *College* (one if 4-year college degree or more), *Female* (one if female), *Above median age* (one if subject older than 47). Robust standard errors in parentheses. ** $p < 0.05$, *** $p < 0.01$

C Online Appendix: Lab Experiment

In this appendix, we report an earlier implementation of the experimental design with subjects in the role of spectators from a student subject pool. The workers were recruited from the online labor market Amazon Mechanical Turk, as in the main experiment. Except for recruiting spectators from a different subject pool and having them make decisions in a controlled laboratory environment, the actual implementation of the laboratory experiment differed only in two aspects. First, worker pairs and spectators were matched 1:1 rather than 5:1, as in our main experiment. Second, we did not ask the three questions about general attitudes ("Gold Medalist," "Superstar," "tax on op 1% income earners"). Importantly, all experimental instructions and the four treatments were identical across both experiments.

We recruited 349 subjects to the role of spectators among the student population at the Norwegian School of Economics. We randomly assigned each spectator to one pair of workers. The study was conducted in a computer lab using a web-based interface enabling us to randomize treatments within sessions. We conducted five sessions, all of which took place on the same day, immediately after collecting the data in the online labor market. The experimental procedure ensured that experimenters could not link decisions to individual spectators.

In the analysis, we focus on the 308 spectators who were matched to pairs of workers who differed in their performance.[22] The spectators were on average 22 years of age, 42 percent were female, and 60 percent expressed a right-wing political preference on a 5-point left-right scale. The background characteristics balance across treatments, which is shown in Table C.1. Data and code from the lab experiment are also available from `https://www.github.com/fair-nhh/mmwinner/`.

Models (1) and (4) in Table C.2 correspond to models (1) and (4) in Table A.2. The constant terms reveal that the proportion of spectators who do not redistribute at all and the share of the earnings allocated to the winner amount to 58 and 86 percent, respectively, in the WTA treatment. Contrary to the main experiment, these two values are significantly smaller in the WTA-No Expectations treatment compared to the WTA treatment. However, even in the WTA-No Expectations treatment, the proportion of spectators who do not redistribute at all and the share of the earnings allocated to the winner amount to 32 and 75 percent, respectively. The results from the student sample are thus in line with Result 1 in the main paper.

[22] Workers performed equally well in 41 pairs. Since there is no distinct winner in these cases, we do not include these pairs in our analysis.

Models (2) and (5) in Table C.2 correspond to models (2) and (6) in Table 2. The highly significant coefficients on *WTA Competition* replicate Result 2. Notably, the coefficients on *WTA Competition* are even larger in the student sample than in the general population sample, which is in line with the heterogeneity analysis for the general population sample reported in Tables A.3 and A.4.

Models (3) and (6) in Table B.1 correspond to models (2) and (6) in Table 3. The coefficient on *Winning margin* is insignificant in model (3). In model (6), the coefficient is almost identical to the coefficient we find for the general population sample in the main study. These findings replicate Result 3.

We do not replicate the heterogeneity analysis, given the homogeneity of the student sample. Since the questionnaire items about general attitudes were not part of the lab experiment, we cannot replicate the analysis provided in Section 3.5 in the main paper.

Table C.1: Randomization into Treatments: Lab Experiment

	All	WTA	WTA-No Choice	WTA-No Exp.	Luck	$F-test$
Age	21.98	22.23	22.06	21.74	21.76	0.370
Female	.416	.372	.489	.429	.326	0.247
Right wing	.594	.558	.568	.637	.628	0.656
N	308	86	88	91	43	308

Notes: The table reports sample means in terms of age, gender and political preferences, overall and by treatment. Age is the spectator age in years. Female is an indicator variable taking the value one if the spectator is a female. Right-wing is an indicator variable taking the value one if the spectator self-reports to be either somewhat or very right-wing on a five-point political left-right scale. $F-test$ reports the p-value from a regression of the particular background variable on the treatment indicator variables.

Table C.2: Replication of Main Results: Lab Experiment

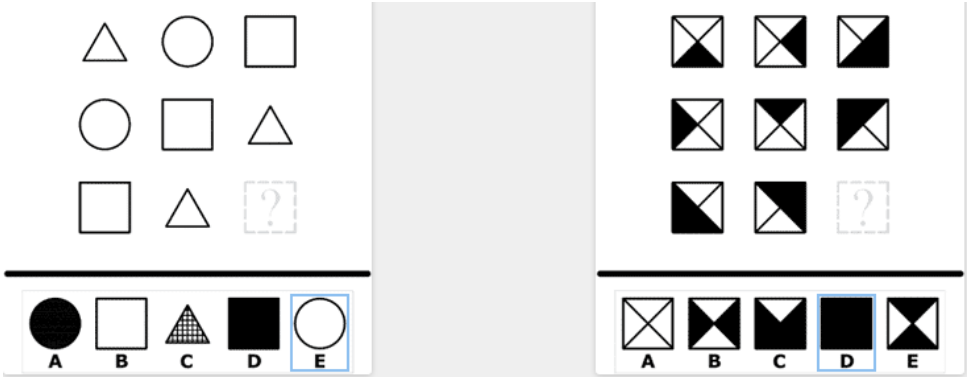
	All to winner			Share to winner		
	(1)	(2)	(3)	(4)	(5)	(6)
WTA-No Choice	-0.104			-0.052		
	(0.076)			(0.030)		
WTA-No Exp.	-0.263***			-0.107***		
	(0.073)			(0.029)		
WTA Competition		0.349***			0.222***	
		(0.060)			(0.032)	
Winning margin			0.010			0.006**
			(0.009)			(0.003)
Constant	0.581***	0.068	0.248	0.860***	0.557***	0.699***
	(0.054)	(0.329)	(0.371)	(0.021)	(0.132)	(0.140)
Session FE	No	Yes	Yes	No	Yes	Yes
Control variables	No	Yes	Yes	No	Yes	Yes
N	265	308	265	265	308	265
adj. R^2	0.040	0.044	-0.008	0.042	0.120	0.005

Notes: Models (1) and (4) report linear regressions of the variables *All to winner* (an indicator variable that is set to one if a spectator allocated all earnings to the winner) and *Share to winner* (share of earnings allocated to the winner by a spectator), respectively, on dummy variables for the WTA-No Choice and WTA-No Expectations treatments. The WTA treatment serves as the omitted category. Models (2) and (5) present linear regression models examining the influence of winner-take-all competition on *All to winner* and *Share to winner*, respectively. The Luck treatment serves as the omitted category. Models (3) and (6) present linear regression models examining the influence of the winning margin in the three winner-take-all treatments on *All to winner* and *Share to winner*, respectively. *WTA Competition* is an indicator variable that assumes a value of one for data derived from the three winner-take-all treatments. *Winning Margin* is the number of problems by which the winner outperformed the loser, ranging from 1 to 21. Control variables are *Age* (in years), *Female* (one if female), and *Right-wing* (one if either somewhat or very right-wing on a five-point political left-right scale). Robust standard errors in parentheses. ** $p < 0.05$, *** $p < 0.01$

D Online Appendix: Experimental Instructions

D.1 General instructions to workers (first screen)

In this study you will perform a pattern recognition task. The task is to decide which figure is missing based on a logical pattern. This pattern is present in both a horizontal and a vertical direction. Below you can see two example questions and the correct answers.



In total the task consists of 24 problems and you will have 10 minutes to record your answers.

On the next screen, we will give you some further information before you start on the task.

D.2 Specific instructions to workers (second screen): Treatment WTA

You can choose between two options for earning bonus points on the task:

Option A: You earn 5 bonus points for every correct answer in the pattern recognition task.
Option B: You will be paired with another, randomly determined, participant in the study. Both of you will perform the exact same task. You will earn:

- 15 bonus points for every correct answer if you solve at least as many problems as the other participant.
- 0 bonus points if you solve fewer problems than the other participant.

After your earnings of bonus points are determined, there will be another phase (which you will not take part in) that may affect the final distribution of bonus points between you and the other participant.

Please choose option for earnings:
Option A
Option B

When you press the button below the pattern recognition task will start and you will have 10 minutes to record your answers.

Good luck!

D.3 Specific instructions to workers (second screen): Treatment WTA-No Choice

You will be paired with another, randomly determined, participant in the study. Both of you will perform the exact same task. You will earn:

- 15 bonus points for every correct answer if you solve at least as many problems as the other participant.
- 0 bonus points if you solve fewer problems than the other participant.

After your earnings of bonus points are determined, there will be a final phase (which you will not take part in) that may affect the distribution of bonus points between you and the other participant.

When you press the button below the pattern recognition task will start and you will have 10 minutes to record your answers.

Good luck!

D.4 Specific instructions to workers (second screen): Treatment WTA-No Expectations

When you press the button below the pattern recognition task will start and you will have 10 minutes to record your answers.

Good luck!

D.5 Specific instructions to workers (second screen): Treatment Luck

When you press the button below the pattern recognition task will start and you will have 10 minutes to record your answers.

Good luck!

D.6 Specific instructions to spectators: Treatment WTA

Background

In another study we have conducted, participants were asked to solve 24 pattern recognition problems in 10 minutes. Before doing the task the participant could choose how he or she wanted the earnings for the task to be determined. The participant had two options:

Option A: The participant would be paid 5 cents for every correct answer.
Option B: The participant would be paired with another, randomly determined, participant in the study that also chose option B and his or her earnings would then be determined as follows:

- 15 cents for every correct answer if the participant solved at least as many problems as the other participant.
- Nothing if the participant solved fewer problems than the other participant.

The participants were also told that if they chose option B, there would be a final phase (which they would not take part in) that might affect the distribution of bonus points between the two participants, and thereby also how much they were paid for the task.The participants were not given any further information after completing the task. The only feedback each participant will receive from the study is the amount of money that is paid out to him or her.

Your choice

You are to be the decision maker in the final phase for one pair of participants, here referred to as participant X and participant Y, who both chose option B.Participant X solved x1 problems and participant Y solved x2 problems. Hence, participant X earned e1 USD and participant Y earned e2 USD. You are now to determine whether there should be any redistribution of earnings between person X and person Y. If you decide not to redistribute anything, person X will be paid e1 USD and person Y will be paid e2 USD for the task.

Remember that this is a real choice; your choice will determine how much two individuals are paid for doing this task.

D.7 Specific instructions to spectators: Treatment WTA-No Choice

Background

In another study we have conducted, participants were asked to solve 24 pattern recognition problems in 10 minutes. Before doing the task, the participant was told that he or she would be paired with another, randomly determined, participant in the study and that his or her earnings would be determined as follows:

- 15 cents for every correct answer if the participant solved at least as many problems as the other participant.
- Nothing if the participant solved fewer problems than the other participant.

The participants were also told that there would be a final phase (which they would not take part in) that might affect the distribution of bonus points between the two participants, and thereby also how much they were paid for the task.

The participants were not given any further information after completing the task. The only feedback each participant will receive from the study is the amount of money that is paid out to him or her.

Your choice

You are to be the decision maker in this final phase for one pair of participants, here referred to as participant X and participant Y. Participant X solved x1 problems and participant Y solved x2 problems. Hence, participant X earned e1 USD and participant Y earned e2 USD. You are now to determine whether there should be any redistribution of earnings between person X and person Y. If you decide not to redistribute anything, person X will be paid e1 USD and person Y will be paid e2 USD for the task.

Remember that this is a real choice; your choice will determine how much two individuals are paid for doing this task.

D.8 Specific instructions to spectators: Treatment WTA-No Expectations

Background

In another study we have conducted, participants were asked to solve 24 pattern recognition problems in 10 minutes. The participants were not at any point told that they would receive payment for doing the task. The only feedback the participants will receive from that study is the amount of money that is paid out to him or her.

The payment to each participant will be determined in two steps. First, each participant is paired with another, randomly determined, participant in the study and his or her earnings are determined as follows:

- 15 cents for every correct answer if the participant solved at least as many problems as the other participant.
- Nothing if the participant solved fewer problems than the other participant.

Second, there will be a final phase were a third person will be given the opportunity to change the distribution of bonus points between the two participants, and thereby also how much they are paid for the task.

Your choice

You are to be the decision maker in this final phase for one pair of participants, here referred to as participant X and participant Y. Participant X solved x1 problems and participant Y solved x2 problems. Hence, participant X earned e1 USD and participant Y earned e2 USD. You are now to determine whether there should be any redistribution of earnings between person X and person Y. If you decide not to redistribute anything, person X will be paid e1 USD and person Y will be paid e2 USD for the task.

Remember that this is a real choice; your choice will determine how much two individuals are paid for doing this task.

D.9 Specific instructions to spectators: Treatment Luck

Background

In another study we have conducted, participants were asked to solve 24 pattern recognition problems in 10 minutes. The participants were not at any point told that they would receive payment for doing the task. The only feedback the participants will receive from that study is the amount of money that is paid out to him or her.

The payment to each participant will be determined in two steps. First, each participant is paired with another, randomly determined, participant in the study and then there is a random allocation procedure that determines the earnings for the two. This means that their performance did not at all influence their earnings. Second, there will be a final phase were a third person will be given the opportunity to change the distribution of bonus points between the two participants, and thereby also how much they are paid for the task.

Your choice

You are to be the decision maker in the final phase for one pair of participants, here referred to as participant X and participant Y. Both participants completed the task. The random allocation procedure assigned e1 USD to participant X and e2 USD to participant Y. You are now to determine whether there should be any redistribution of earnings between person X and person Y. If you decide not to redistribute anything, person X will be paid e1 USD and person Y will be paid e2 USD for the task.

Remember that this is a real choice; your choice will determine how much two individuals are paid for doing this task.