Inequality Acceptance

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Concern for inequality

Classical Inequality Comparisons

- Compare the actual income distribution to a distribution were everyone has the same (mean) income.
- Hence, trying to minimize classical inequality is consistent with an **egalitarian** fairness norm.

No concern for Inequality

- Market outcome is the fair outcome.
- No focus on minimizing inequality is consistent with a **libertarian** fairness norm.

The majority

Most people hold positions that lies between the egalitarian and the libertarian position:

- Most people accept some kinds of inequality, but not other kinds of inequality as fair.

What could cause people accept inequalities:

- Fairness position (if different from egalitarian),
- Cost of redistribution or differences in needs.

Inequality acceptance – today's talk

1. How does inequality acceptance vary across countries?
   - Almås, Cappelen and Tungodden, *Working Paper*, 2018.
2. How does inequality acceptance develop with age?
   - Almås, Cappelen, Sørensen and Tungodden, *Science*, 2010.
3. How does inequality acceptance vary by socio-economic status?
   - Almås, Cappelen, Salvanes, Sørensen, *Politics, Philosophy and Economics*, 2016.
4. Once we know inequality acceptance, how can we measure deviations from what people (the general population or politicians) find fair?
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Inequality aversion

Standard dictator games have established that adults are inequality averse.

- Adults are willing to sacrifice personal gains in order to reduce inequalities in outcomes (Fehr and Falk, 2002; Camerer, 2003).

BUT: It is also well established that most adults, in more complex economic environments, find some inequalities fair.

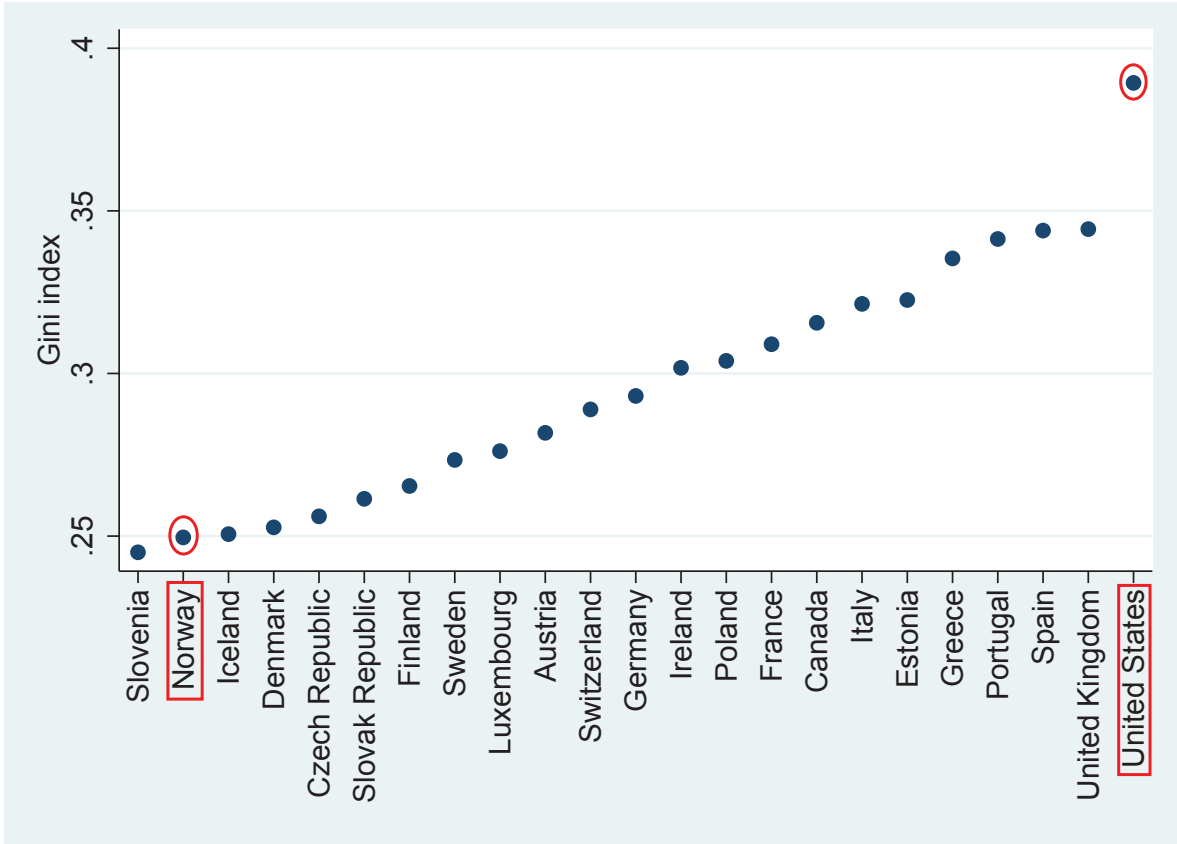
- Most adults believe that differences in individual achievements and efficiency considerations may justify an unequal distribution of income (Konow, 2000; Andreoni, 2002; Cappelen et al. 2007).

US versus Scandinavia: Very different societies in terms of inequality, redistribution and welfare policies

- More poverty and inequality in the US than in Scandinavia (World Bank, 2013).
  - Huge difference in overall income inequality and relative poverty.
  - Top 1% of earners capturing almost 18-19% of total national income in the US, around 5-8% in Scandinavia (Atkinson, Piketty and Saez, 2011, www.knoema.com).

- Scandinavian countries have "much stronger safety nets, more elaborate welfare states, and more egalitarian income distributions" (Acemoglu, Robinson, Verdier, 2012, 2014).

Income inequality: Two extremes in the OECD



Gini inequality measure (disposable income) for countries in Europe and North America. The data are from the *OECD stat extract* webpage.

Poverty rates much higher in the US than in Scandinavia

Figure 5.1. **Relative poverty rates for different income thresholds, mid-2000s**

Relative poverty rates at 40, 50 and 60% of median income thresholds

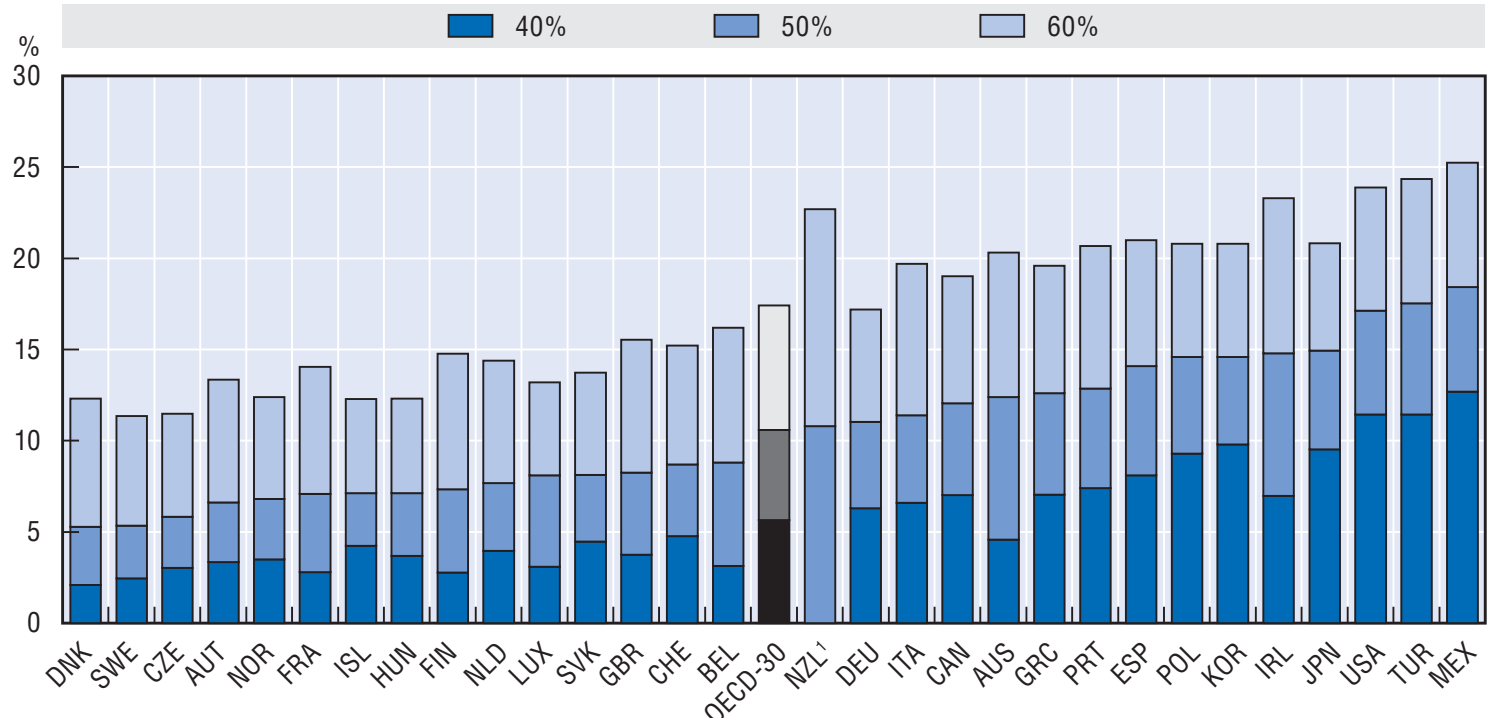


Figure from OECD (2008): *Growing Unequal? Income Distribution and Poverty in OECD Countries*.

Cutthroat capitalism versus cuddly socialism

- Big differences attracted the attention of researchers (Aaberge, Bjorklund, Jantti, Palme, Pedersen, Smith, and Wennemo, 2002; Aaberge and Petersen, 2014; Acemoglu, Robinson, and Verdier, 2012; Fochesato and Bowles, 2015; Edlund, 1999; Jantti, Bratsberg, Roed, Raaum, Naylor, Osterbacka, Bjorklund, and Eriksson, 2006; Kleven, 2014; Rogerson, 2007; Scruggs, Jahn, and Kuitto, 2014; Stiglitz, 2015).

- This comparison has figured prominently in the public debate.
  - "Stop the Scandimania: Nordic nations aren't the utopias they're made out to be," *The Washington Post*.
  - "A big safety net and strong job market can coexist. Just ask Scandinavia.", *The New York Times*
  - "Why Nordic nations are a role model for us all." *CNN*.

A puzzle for economists

The New York Times

The Opinion Pages

The Conscience of a Liberal

PAUL KRUGMAN

Notes on the Political Economy of Redistribution

SEPTEMBER 21, 2012 10:09 AM 235 Comments

more redistribution. What we see in practice, however, is that European countries with relatively low inequality of market income do much more redistribution than the United States, with its high inequality – and that as America has gotten more unequal, its tax and transfer system has grown less, not *more redistributive*.

I don't think we have a full explanation of these awkward facts. But the model is

What can explain the difference between the US and Scandinavia in inequality and redistribution?

- The (beliefs about) the **source of inequality** may differ.
  - May reflect differences in **effort** in the US and differences in **luck** in Europe (Piketty, 1995; Alesina and Angeletos, 2005; Benabou and Tirole, 2006; Mollerstrom and Seim (2015) and Karadja, Mollerstrom and Seim (2016)).

- The **cost of redistribution** may differ.
  - The cost of redistribution may be greater in the US than in Scandinavia (Kuziemko, Norton, Saez, and Stantcheva, 2015; Acemoglu, Robinson, Verdier, 2012, 2014).

Our focus: social preferences

- People's social preferences may **affect** inequality and redistribution in at least two ways:
  - The political support for redistribution.
  - The pre-redistribution income inequality.

- People's social preferences may clearly be **shaped** by the redistributive institutions that are present in a society.

Research question I: Do Americans and Scandinavians differ in their social preferences?

- **Approach:** We study the distributive behavior of Americans and Scandinavians in **identical economic environments**, where they face **the same source of inequality** and **the same cost of redistribution**.
  - Do we observe more inequality acceptance in the US than in Scandinavia?
  - Do Americans and Scandinavians differ in what they consider to be a fair inequality and in how much they care about fairness?

- Different social preferences in the US and Scandinavia may contribute to explain the observed differences in inequality and redistribution.

Research question II: What causes inequality acceptance?

- How important are **the source of inequality** and **the cost of redistribution** for inequality acceptance?

- A growing experimental literature has considered each of these dimensions separately (Andreoni and Miller, 2002; Fisman, Kariv, and Markovits, 2007; Cappelen, Hole, Sørensen, and Tungodden, 2007; Bellemare, Kruger, and van Soest, 2008; Cappelen, Sørensen, and Tungodden, 2010; Almås, Cappelen, Sørensen, and Tungodden, 2010; Cappelen, Konow, Sørensen, and Tungodden, 2013), but few studies have looked at them in combination.

Pre-analysis plan

- Describes the main research questions and formulates the main hypotheses to be tested.
- Describes the design in detail.
- Describes the identification strategy.
- The plan is publicly available and was posted on AEA RCT registry before we opened any data for analysis.
- The analysis I present today was described in the pre-analysis plan.

Contributions of the paper

- Provides a **novel comparison** of social preferences in the US and Scandinavia (Norway).
- Provides **causal evidence** of the importance of the source of inequality and the cost of redistribution for inequality acceptance in the general population.
- Introduces a **new approach** to conducting nationally representative economic experiments.

Main features of the design

- **Experimental design: Spectators** decide how to pay **workers** for a job they have conducted.
- **Workers** recruited through an international online market place (mturk).
  - Same pool used in the US and Norway.
- **Spectators** recruited and participating through an international data-collection agency (Norstat/Research Now).
  - Representative samples of the populations in the US and Norway.

Design: workers

- When recruited, the workers were promised a participation fee of 2 USD and told that they could earn additional money.
- The workers worked on three different assignments, altogether it took them approximately 20 minutes to finish.
  - Two sentence unscrambling tasks (where there is no measure of productivity).
  - One code recognition task (productivity measured).
- After completing the assignments, they were told how their earnings would be decided.
- We recruited 1334 workers (each worked on 3 assignments giving us 2000 unique pairs of assignments/workers).

Design: spectators

- In each country, we recruited 1000 participants who are nationally representative (+ 18 years old) on observable characteristics.

- The participants acted as spectators (Cappelen, Konow, Sørensen, and Tungodden, 2013) and determined the distribution of earnings between a pair of workers.

- Three treatments, between-individual design.
  - **Luck:** The spectator chooses payments in a situation where *luck* is the source of the inequality and there is *no cost of redistribution*.
  - **Merit:** The spectator chooses payments in a situation where *merit* is the source of the inequality and there is *no cost of redistribution*.
  - **Efficiency:** The spectator chooses payments in a situation where *luck* is the source of the inequality and there is *a significant cost of redistribution*.

Treatment 1: Luck

In contrast to traditional survey questions that are about hypothetical situations, we now ask you to make a choice that has consequences for a real life situation. A few days ago two individuals, let us call them worker A and worker B, were recruited via an international online market place to conduct an assignment.

They were each offered a participation compensation of 2 USD regardless of what they were paid for the assignment. After completing the assignment, they were told that their earnings from the assignment would be determined by a lottery. The worker winning the lottery would earn 6 USD for the assignment and the other worker would earn nothing for the assignment. They were not informed about the outcome of the lottery. However, they were told that a third person would be informed about the assignment and the outcome of the lottery, and would be given the opportunity to redistribute the earnings and thus determine how much they were paid for the assignment.

You are the third person and we now want you to choose whether to redistribute the earnings for the assignment between worker A and worker B. Your decision is completely anonymous. The workers will receive the payment that you choose for the assignment within a few days, but will not receive any further information.

Treatment 1: Luck

Worker A won the lottery and earned 6 USD for the assignment, thus worker B earned nothing for the assignment.

Please state which of the following alternatives you choose:

I do not redistribute:

- worker A is paid 6 USD and worker B is paid 0 USD.

I do redistribute:

- worker A is paid 5 USD and worker B is paid 1 USD.
- worker A is paid 4 USD and worker B is paid 2 USD.
- worker A is paid 3 USD and worker B is paid 3 USD.
- worker A is paid 2 USD and worker B is paid 4 USD.
- worker A is paid 1 USD and worker B is paid 5 USD.
- worker A is paid 0 USD and worker B is paid 6 USD.

Treatment 2: Merit

In contrast to traditional survey questions that are about hypothetical situations, we now ask you to make a choice that has consequences for a real life situation. A few days ago two individuals, let us call them worker A and worker B, were recruited via an international online market place to conduct an assignment.

They were each offered a participation compensation of 2 USD regardless of what they were paid for the assignment. **After completing the assignment, they were told that their earnings from the assignment would be determined by their productivity. The most productive worker would earn 6 USD for the assignment and the other worker would earn nothing for the assignment. They were not informed about who was the most productive worker.** However, they were told that a third person would be informed about the assignment and who was most productive, and would be given the opportunity to redistribute the earnings and thus determine how much they were paid for the assignment.

You are the third person and we now want you to choose whether to redistribute the earnings for the assignment between worker A and worker B. Your decision is completely anonymous. The workers will receive the payment that you choose for the assignment within a few days, but will not receive any further information.

Treatment 2: Merit

Worker A was more productive and earned 6 USD for the assignment, thus worker B earned nothing for the assignment.

Please state which of the following alternatives you choose:

I do not redistribute:

- worker A is paid 6 USD and worker B is paid 0 USD.

I do redistribute:

- worker A is paid 5 USD and worker B is paid 1 USD.
- worker A is paid 4 USD and worker B is paid 2 USD.
- worker A is paid 3 USD and worker B is paid 3 USD.
- worker A is paid 2 USD and worker B is paid 4 USD.
- worker A is paid 1 USD and worker B is paid 5 USD.
- worker A is paid 0 USD and worker B is paid 6 USD.

Treatment 3: Efficiency

In contrast to traditional survey questions that are about hypothetical situations, we now ask you to make a choice that has consequences for a real life situation. A few days ago two individuals, let us call them worker A and worker B, were recruited via an international online market place to conduct an assignment.

They were each offered a participation compensation of 2 USD regardless of what they were paid for the assignment. After completing the assignment, they were told that their earnings from the assignment would be determined by a lottery. The worker winning the lottery would earn 6 USD for the assignment and the other worker would earn nothing for the assignment. They were not informed about the outcome of the lottery. However, they were told that a third person ...

You are the third person and we now want you to choose whether to redistribute the earnings for the assignment between worker A and worker B. Your decision is completely anonymous. The workers will receive the payment that you choose for the assignment within a few days, but will not receive any further information.

Worker A won the lottery and earned 6 USD for the assignment, thus worker B earned nothing for the assignment. **There is a cost of redistribution. If you choose to redistribute, increasing worker B's payment by 1 USD will decrease worker A's payment by 2 USD.**

Treatment 3: Efficiency

Worker A won the lottery and earned 6 USD for the assignment, thus worker B earned nothing for the assignment.

Please state which of the following alternatives you choose:

I do not redistribute:

- worker A is paid 6 USD and worker B is paid 0 USD.

I do redistribute:

- worker A is paid 4 USD and worker B is paid 1 USD.
- worker A is paid 2 USD and worker B is paid 2 USD.
- worker A is paid 0 USD and worker B is paid 3 USD.

Important design choices

- **Real choice**: The decision made by a spectator was matched with a unique pair of workers.
- **Same pre-redistribution earnings in all situations**: All spectators faced the pre-redistribution earnings of (6 USD, 0 USD).
- **Complete information**: Spectators had complete information about the source of the inequality and the cost of redistribution.
- **Avoid reference points**: Workers were not given any information about how payments were decided until the assignments were finished and they were never informed about their earnings, only their income.

Theoretical framework

- We provide a simple social preference model to guide the interpretation of the results.
- The spectators choose the distribution (x, y), where y is the income to the worker with no pre-redistribution earnings. We assume that the spectators care about fairness and efficiency:

$$V(y; \cdot) = -\frac{\beta}{2}(y - m(j))^2 - c(j)y, \tag{1}$$

- where $\beta > 0$ is the weight attached to fairness relative to efficiency, m_j is what the spectator perceives as the fair income to the worker with no pre-redistribution earnings in treatment j, and c_j is the cost of redistribution in treatment j, $j = L, M, E$.

Optimal behavior in the different treatments

- **Luck and Merit treatments**:

$$y(j) = m_j \tag{2}$$

- **Efficiency treatment**:

$$y(E) = m_E \beta/(\beta + 1) \tag{3}$$

- We observe that:
  - $\beta \to 0$ implies that $y(E) \to 0$.
  - $\beta \to \infty$ implies that $y(E) \to m_E$.

Interpretation of treatment effects

- To interpret the treatment effects, we implement the following assumption:
  - $m_L = m_E$
- The model now provides the following predictions for comparisons of treatments:

$$y(L)/y(M) = m_L/m_M. \tag{4}$$

$$y(L)/y(E) = (\beta + 1)/\beta. \tag{5}$$

Summary: Treatments and identification

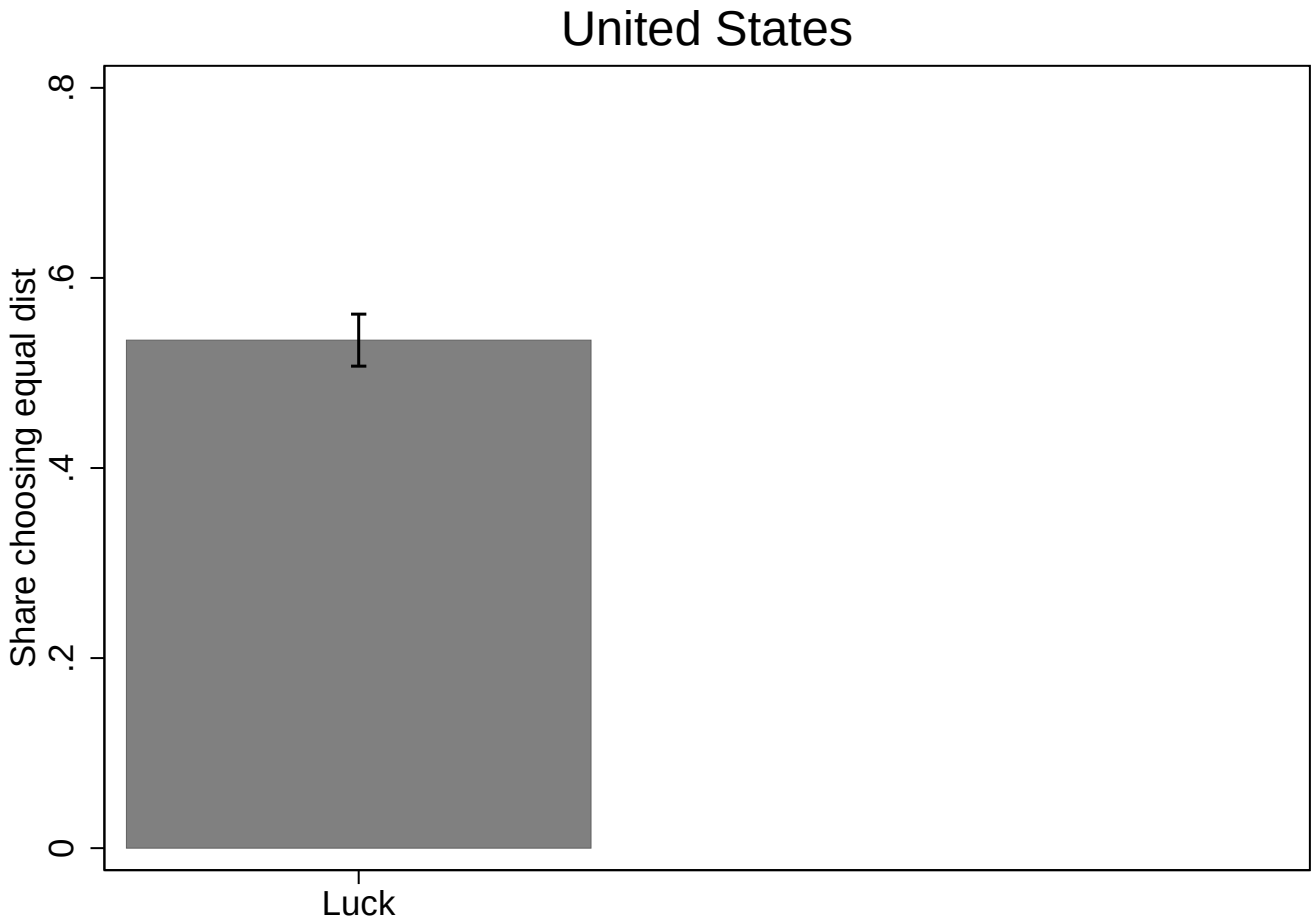
All treatments: Earnings of (6 USD, 0 USD).

- Only difference: Source of inequality or cost of redistribution.

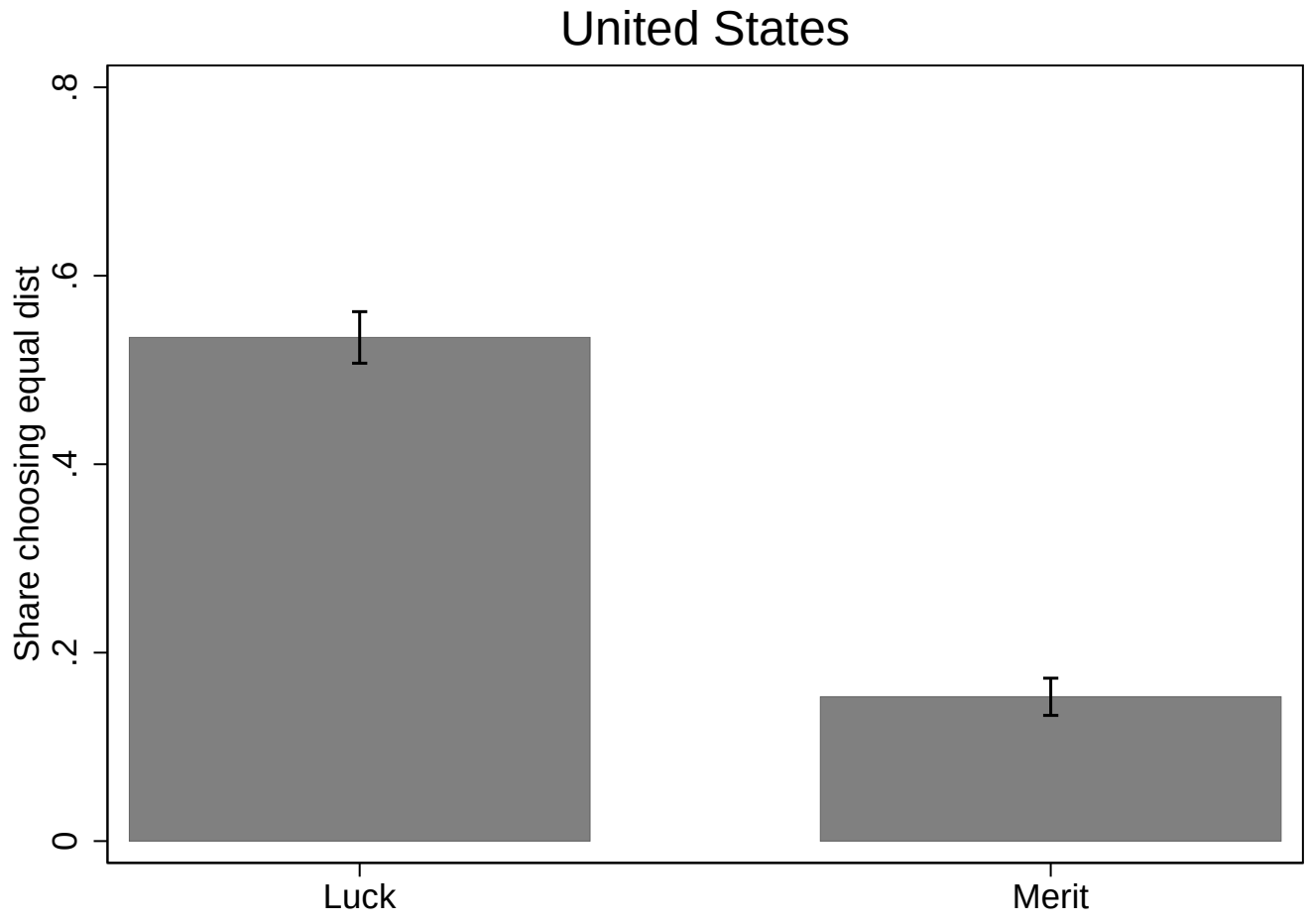
The three treatments enable us to identify:

- General inequality acceptance.
- Causal effect of the source of inequality.
- Causal effect of a cost of redistribution.

Share implementing equality (US): **Luck**



Share implementing Equality (US): **Luck vs Merit**



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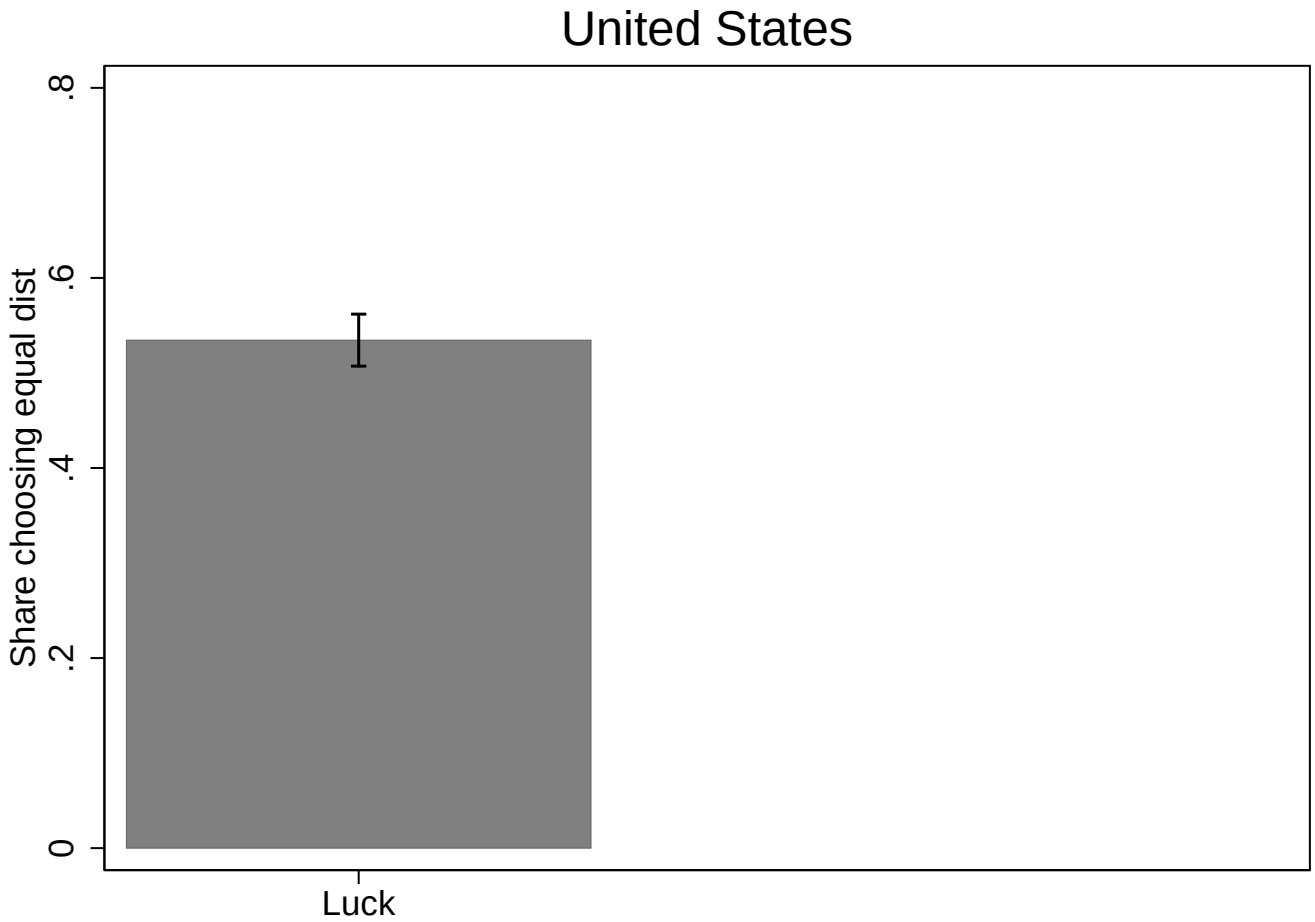

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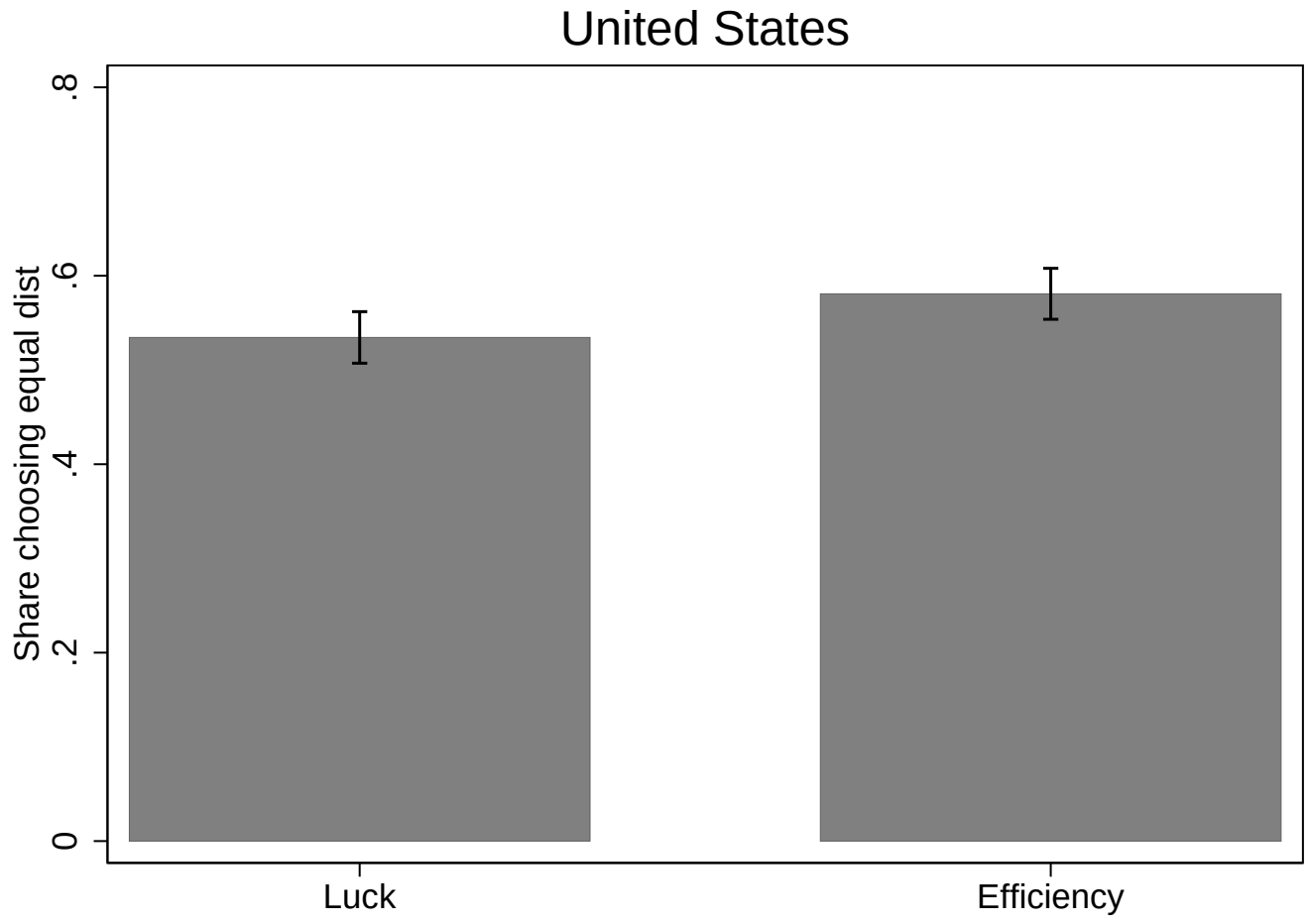
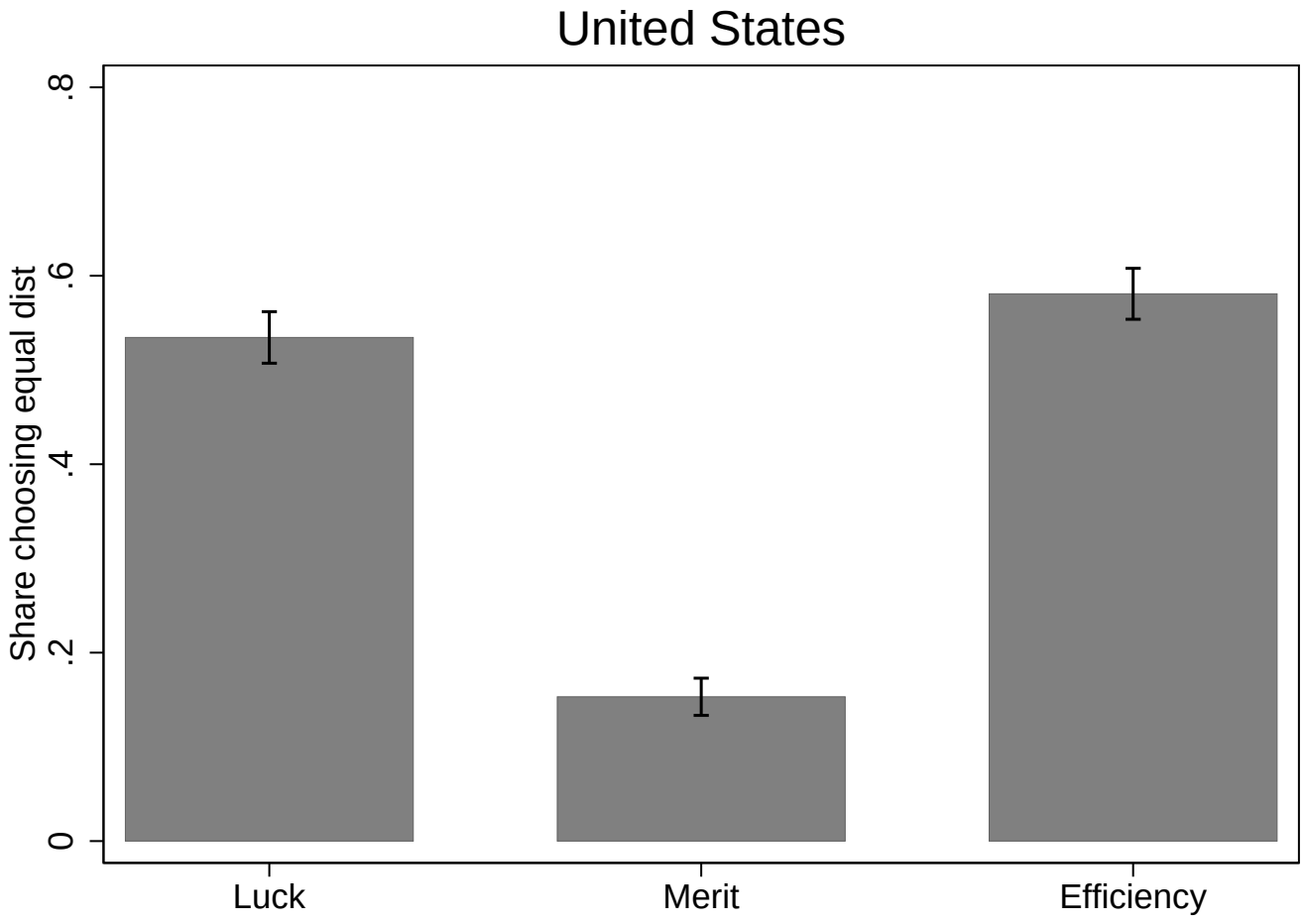
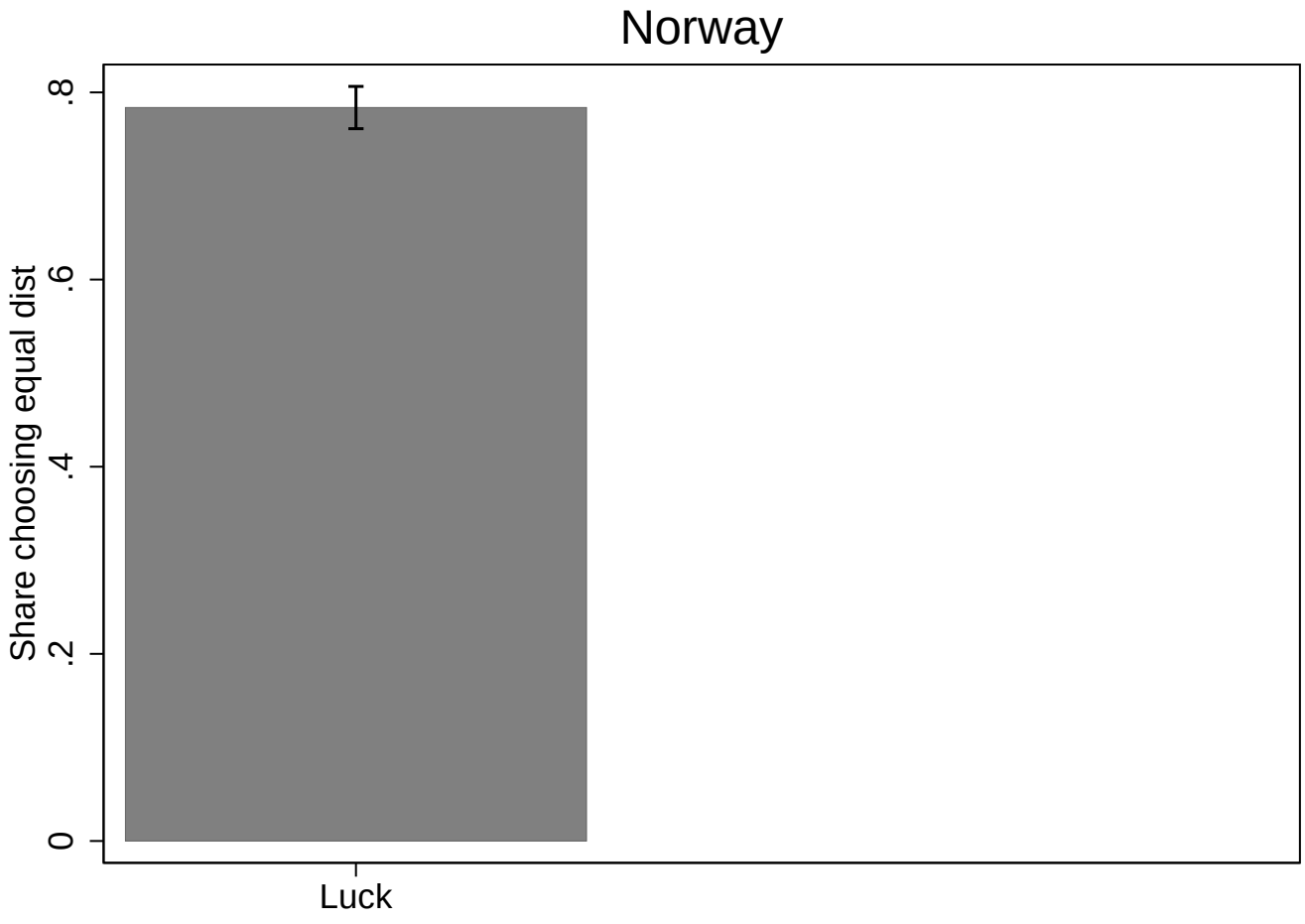


Share implementing equality (US):

Overview



Share implementing equality (Norway): **Luck**



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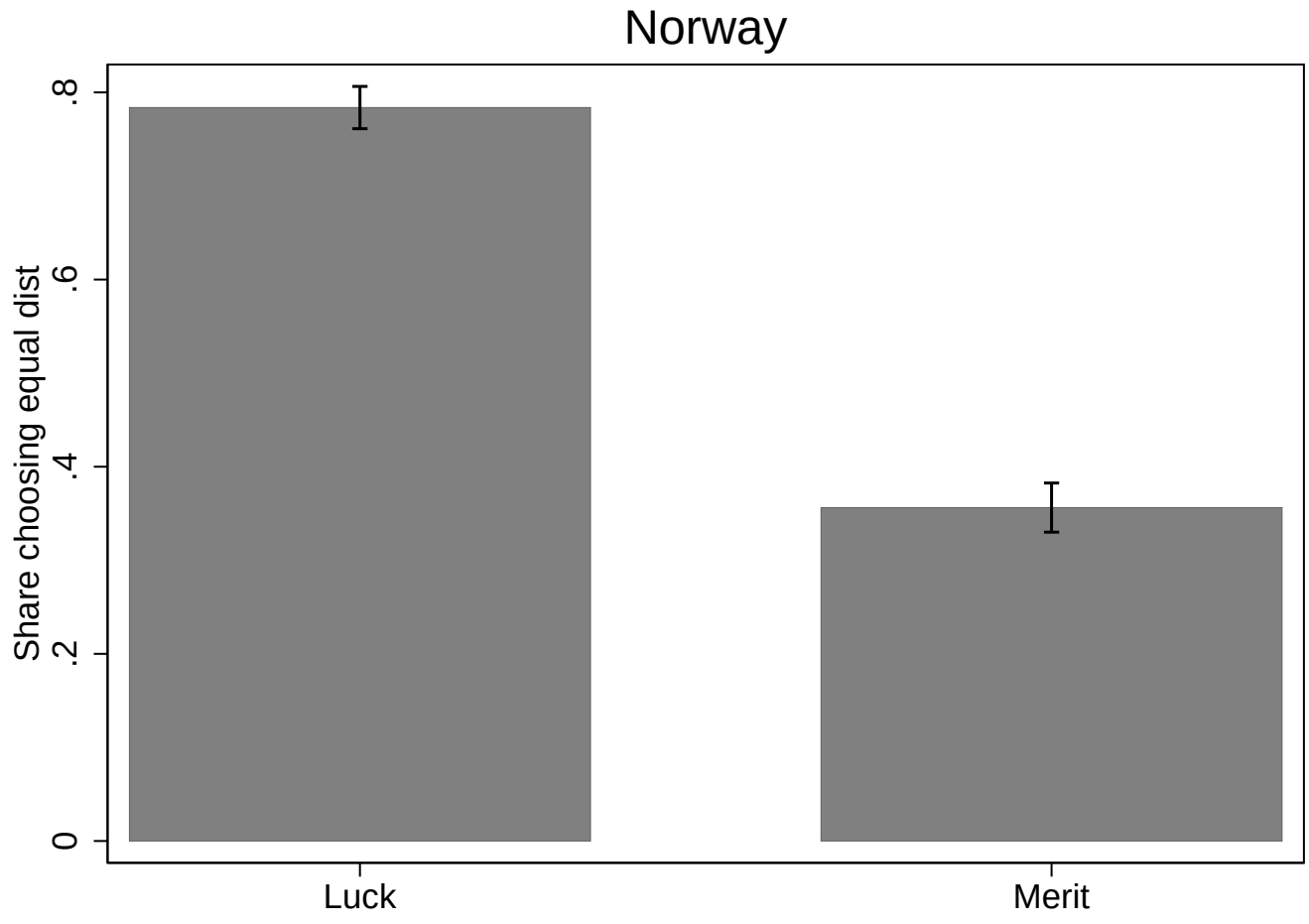
Luck vs Merit



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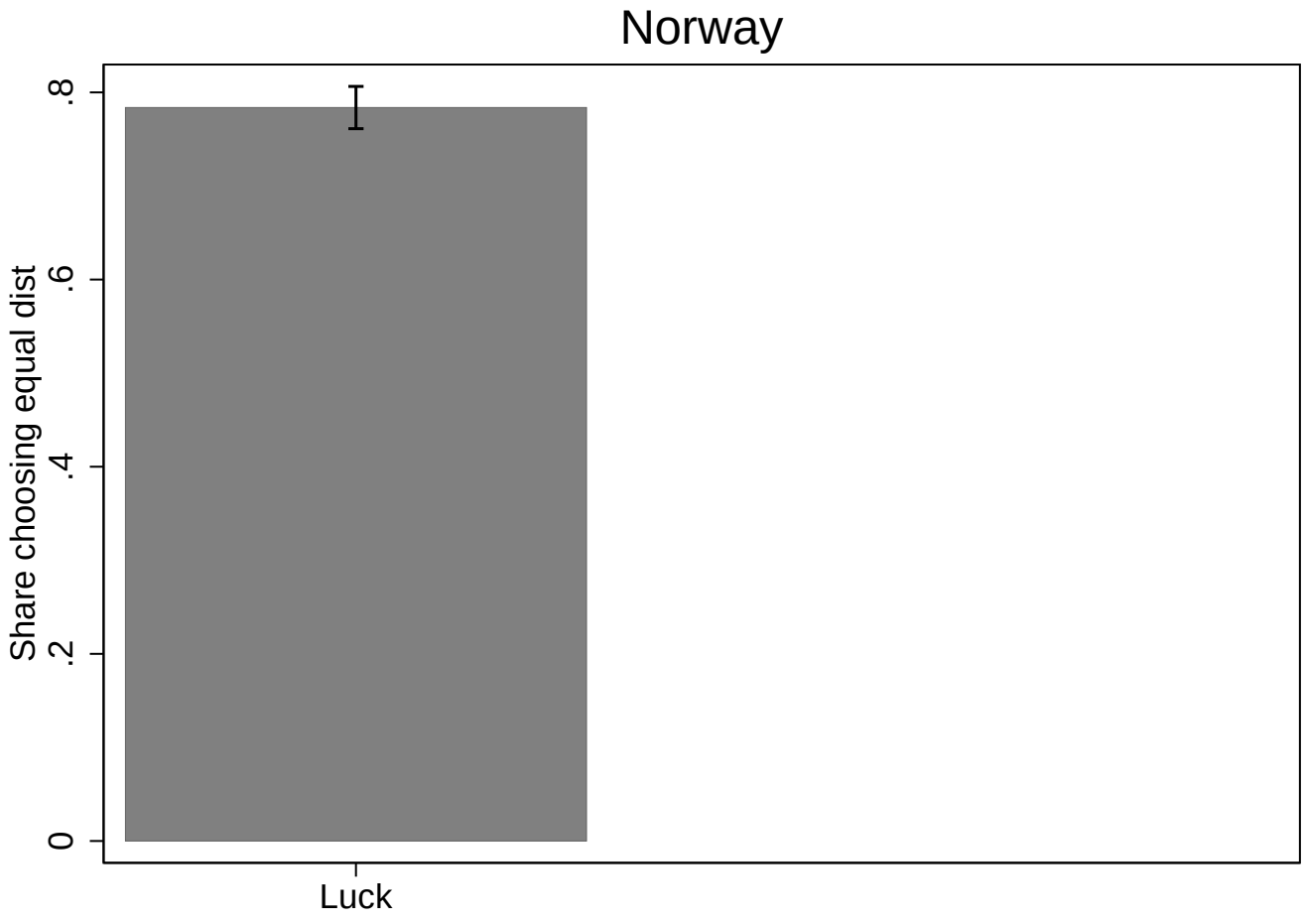

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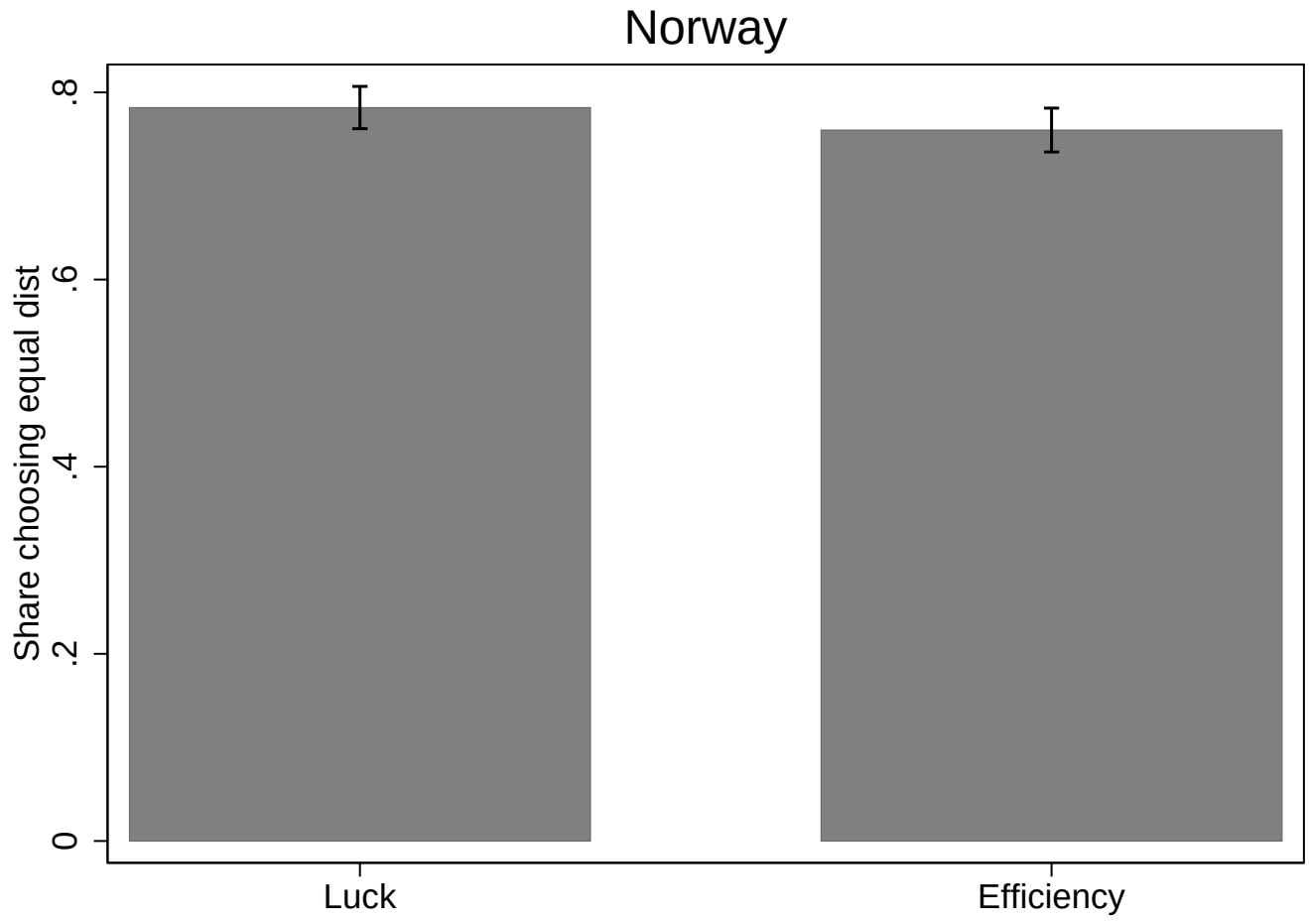
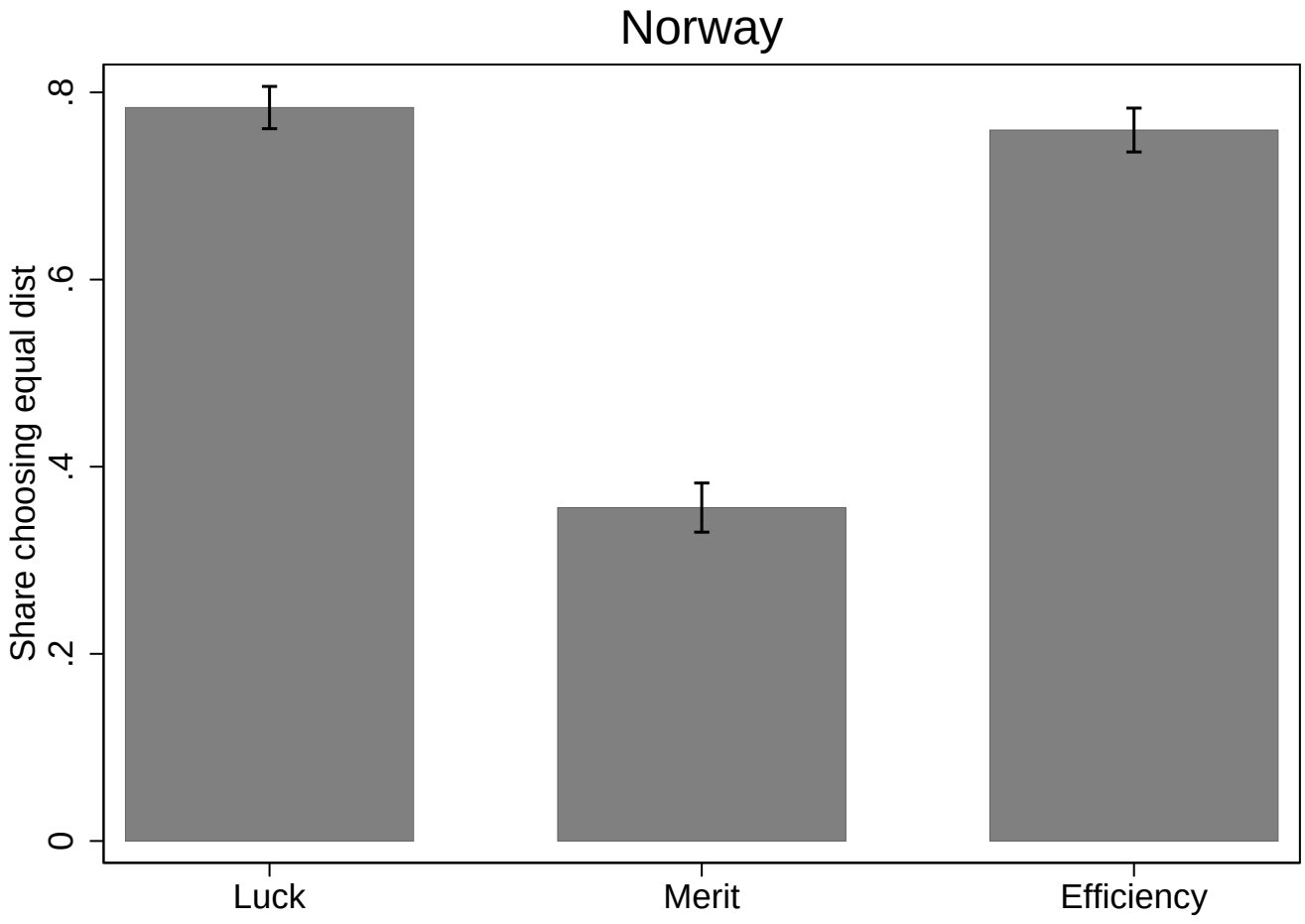
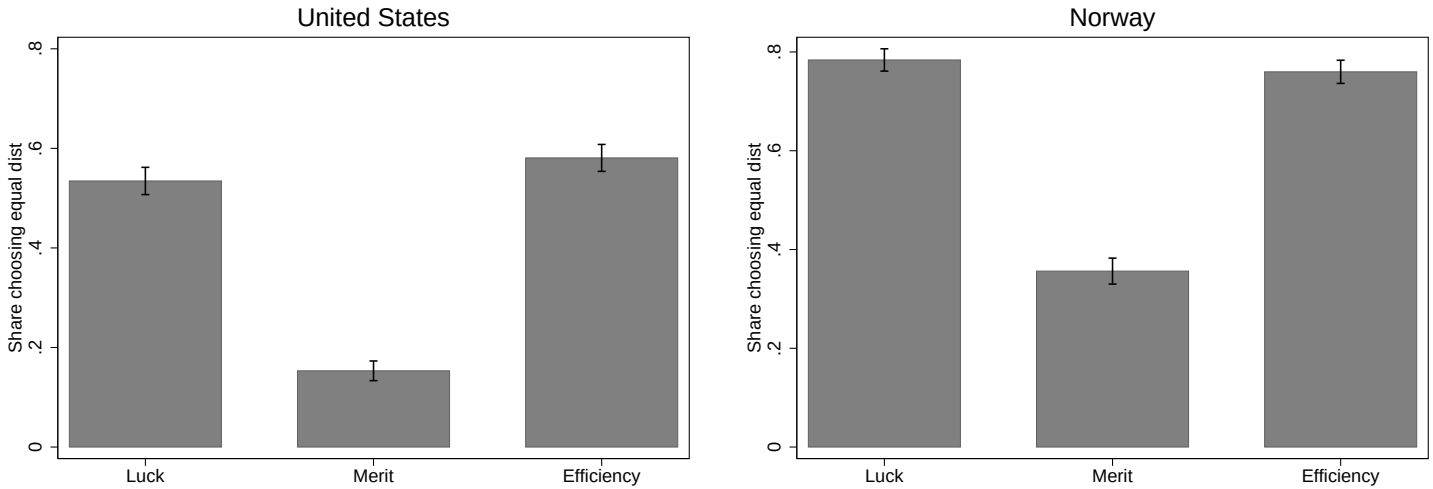
Luck vs Efficiency



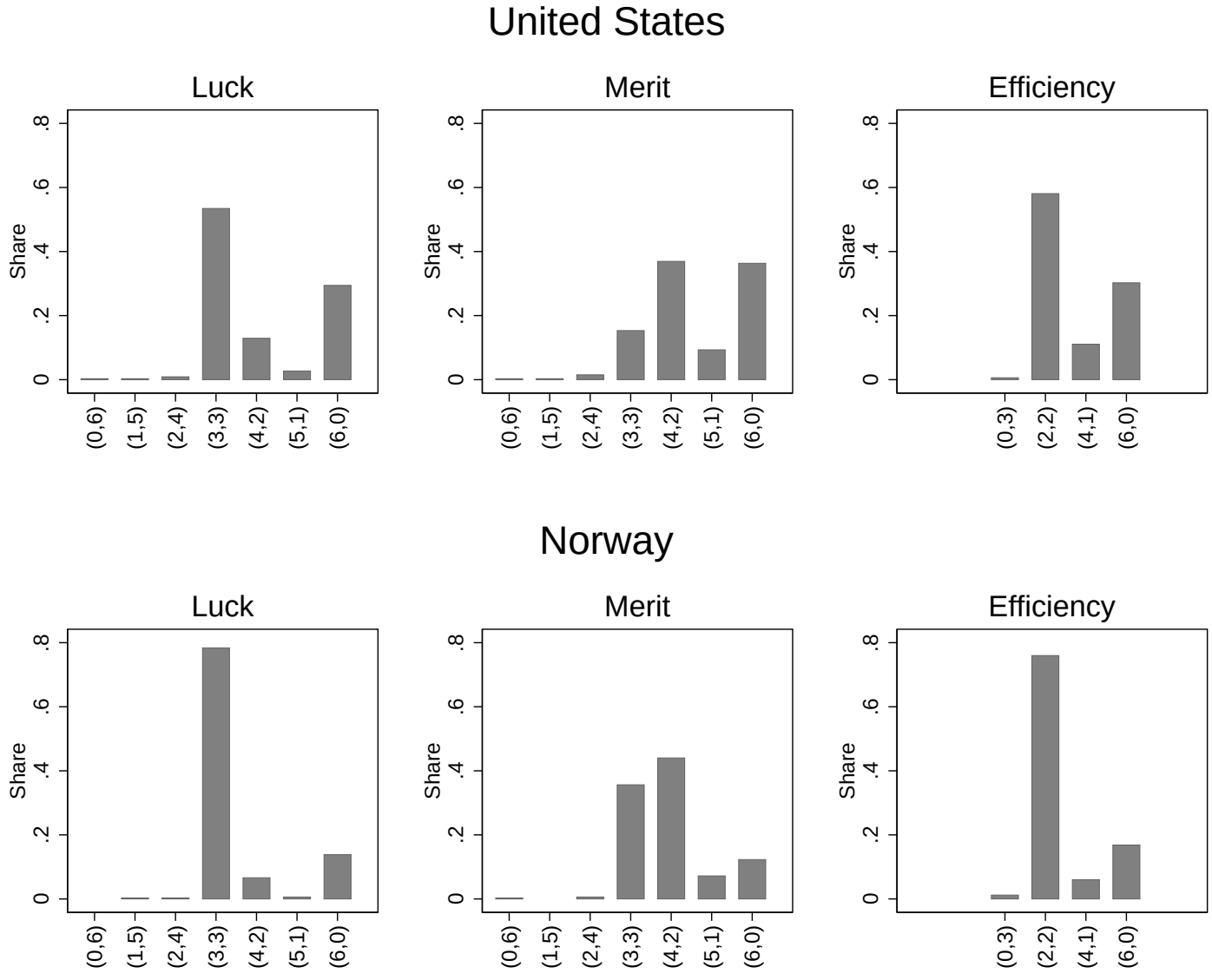
Share implementing equality (Norway): **Overview**



Share implementing equality: **US vs Norway**



Distributive choices: **Overview**



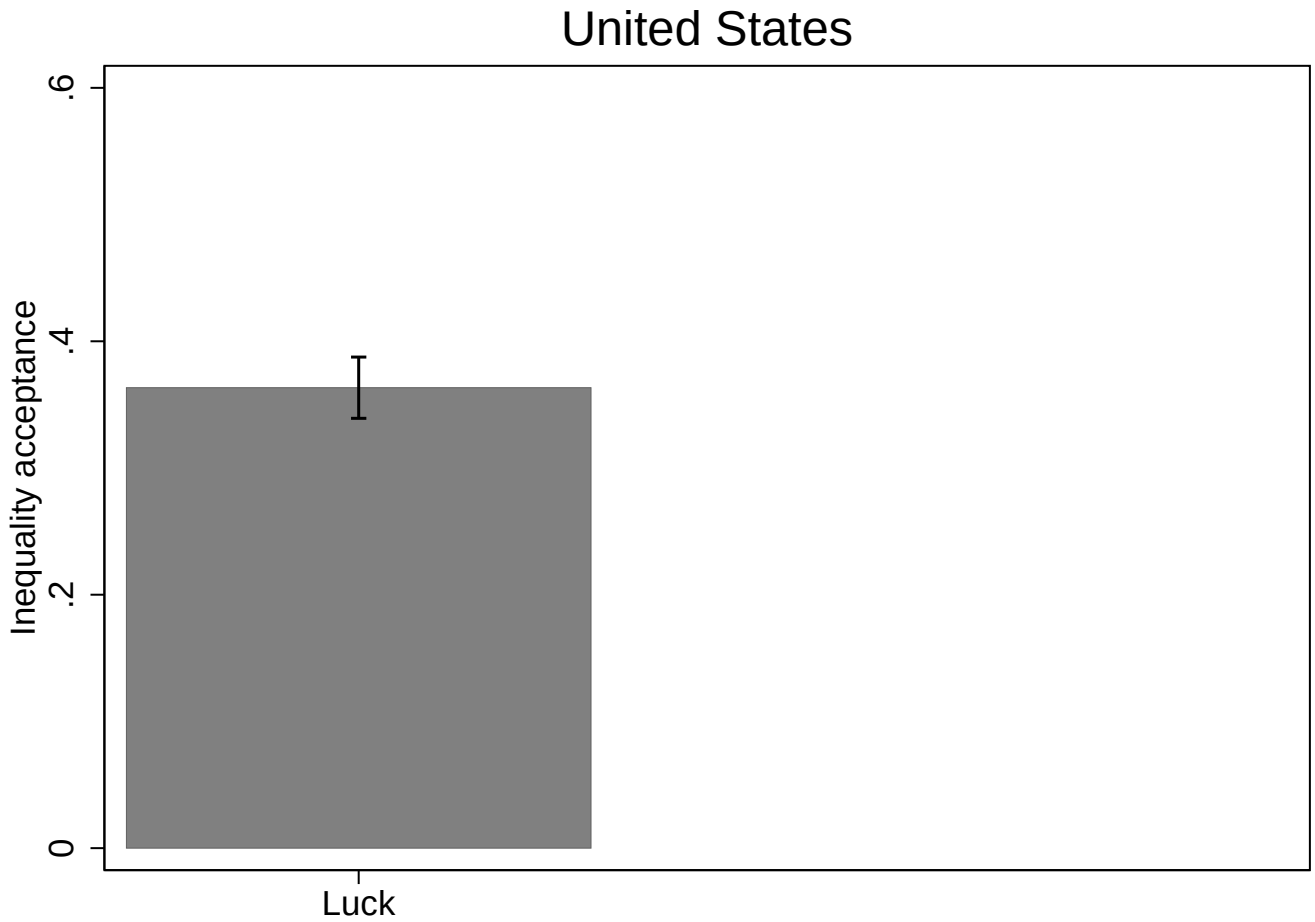
Inequality acceptance

- Inequality implemented by spectator:

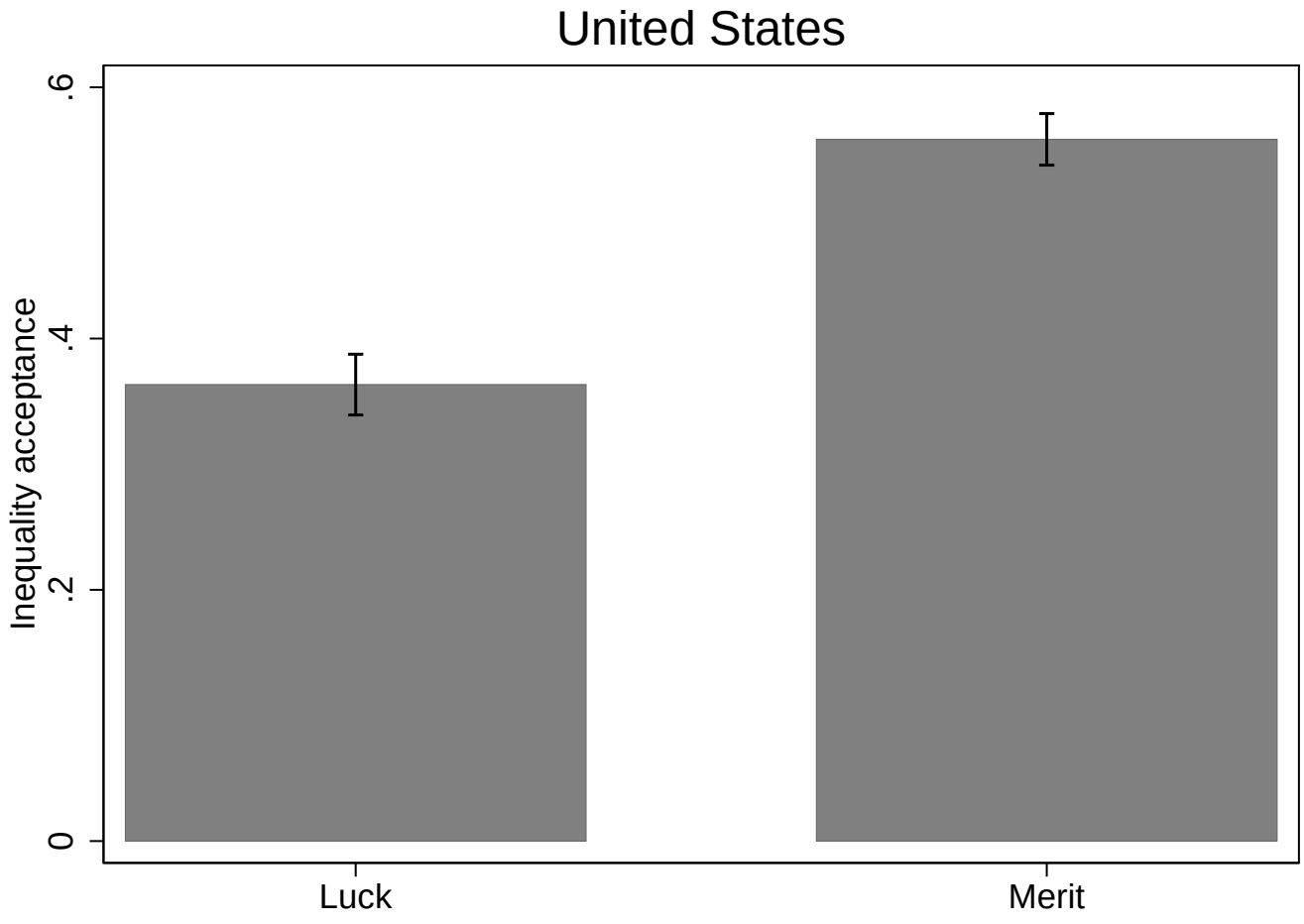
$$e = \frac{|x - y|}{x + y}. \tag{6}$$

- Equivalent to the Gini coefficient in this economic environment.

Inequality acceptance (US): **Luck**



Inequality acceptance (US): **Luck vs Merit**



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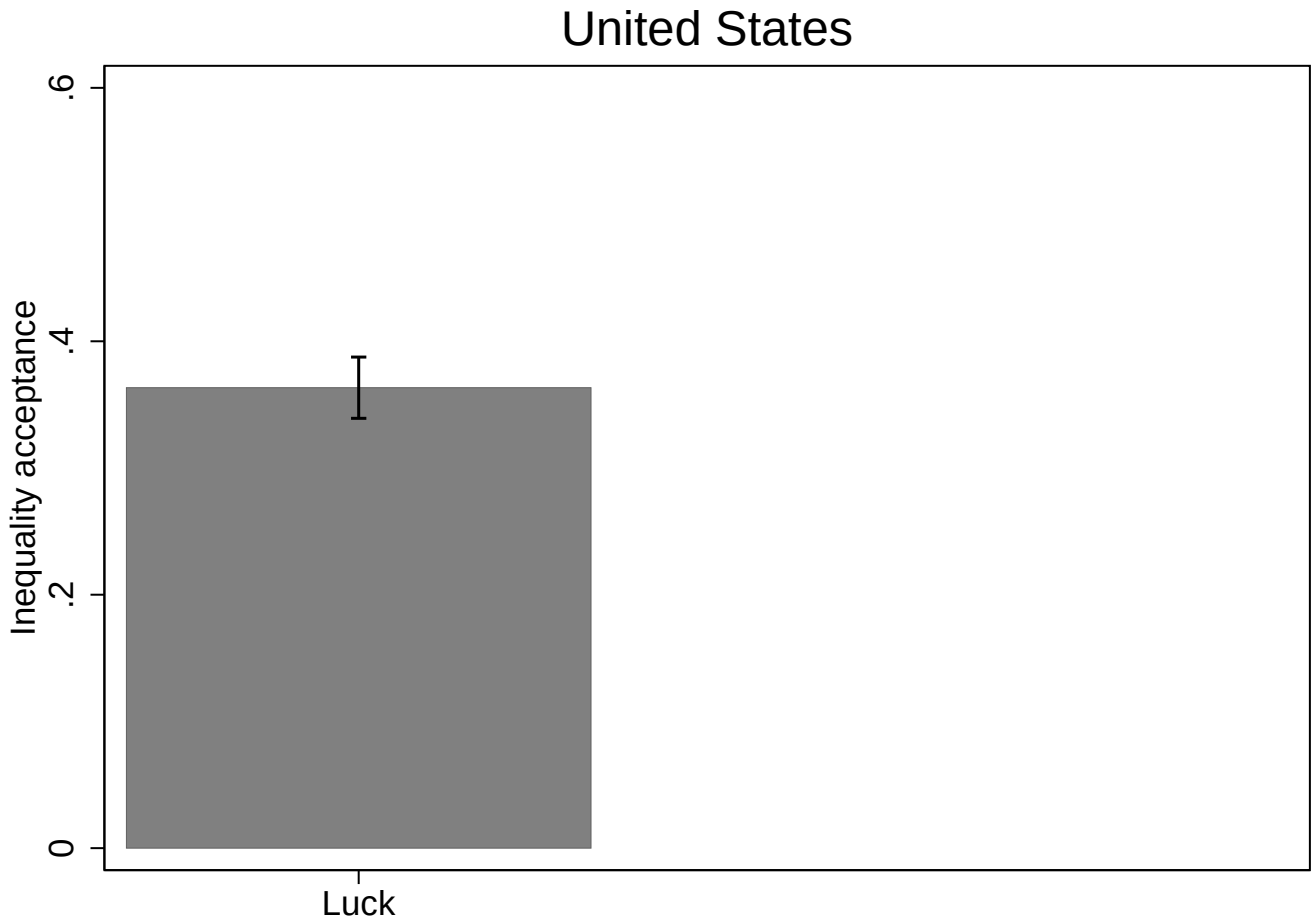

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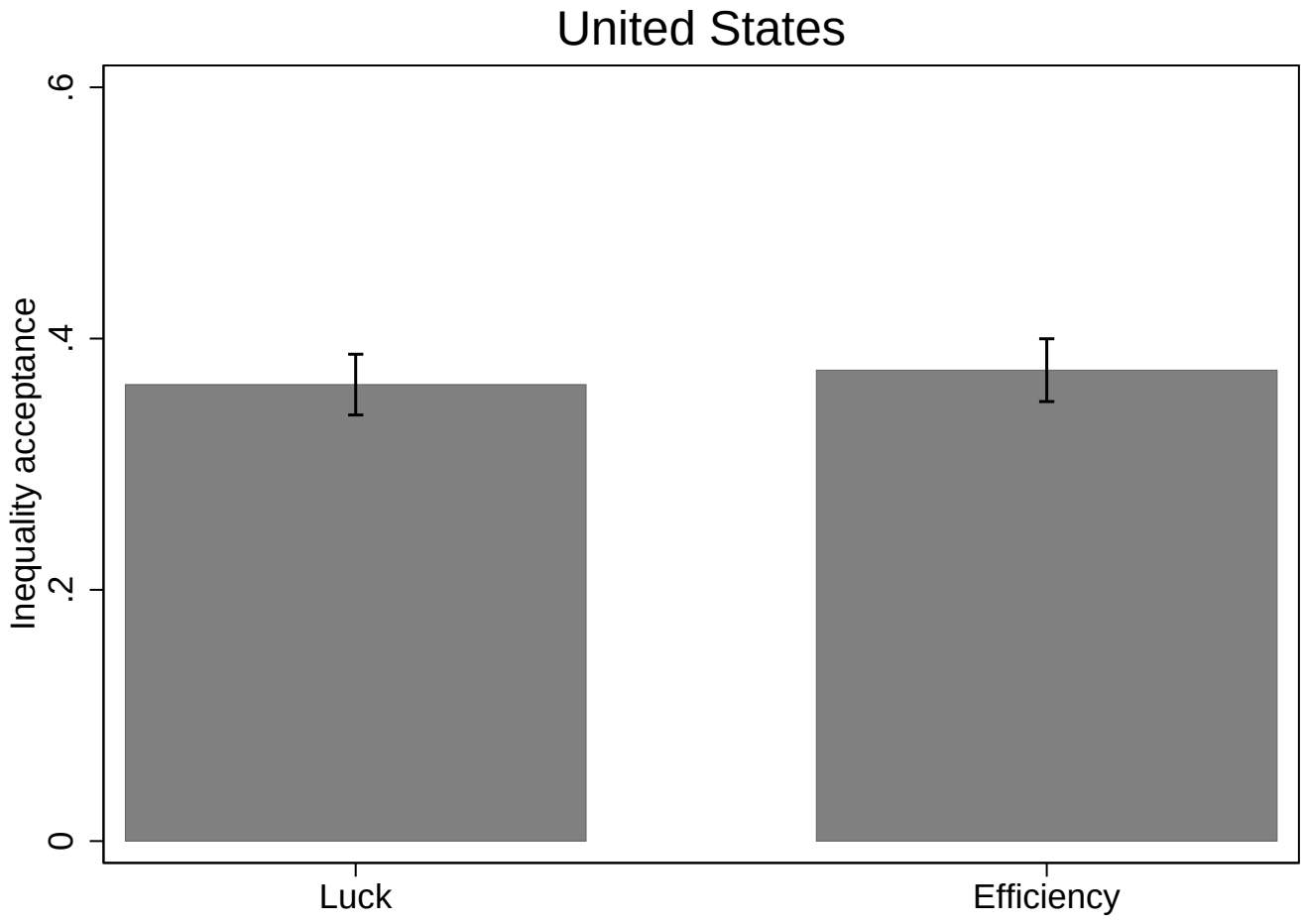

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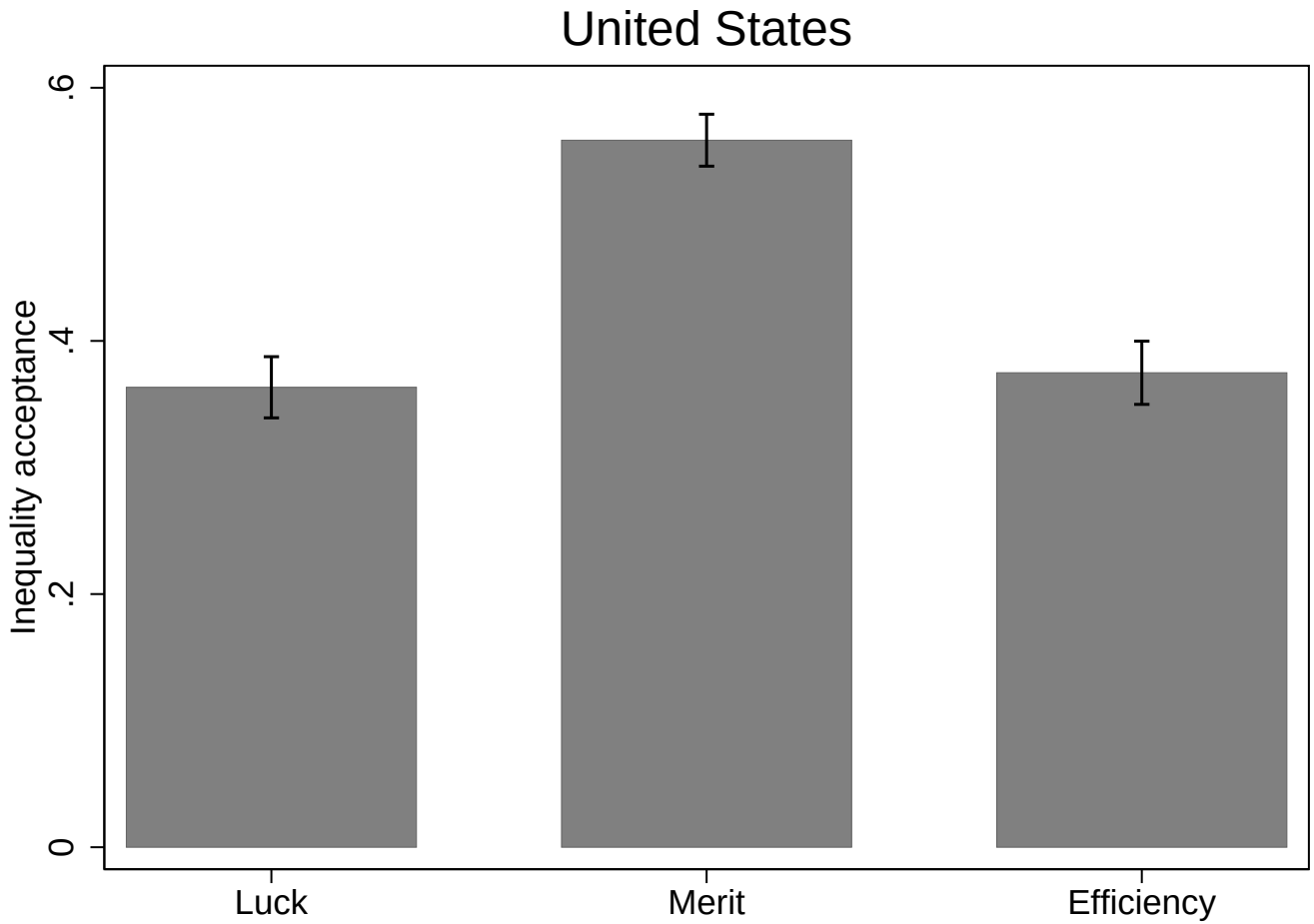

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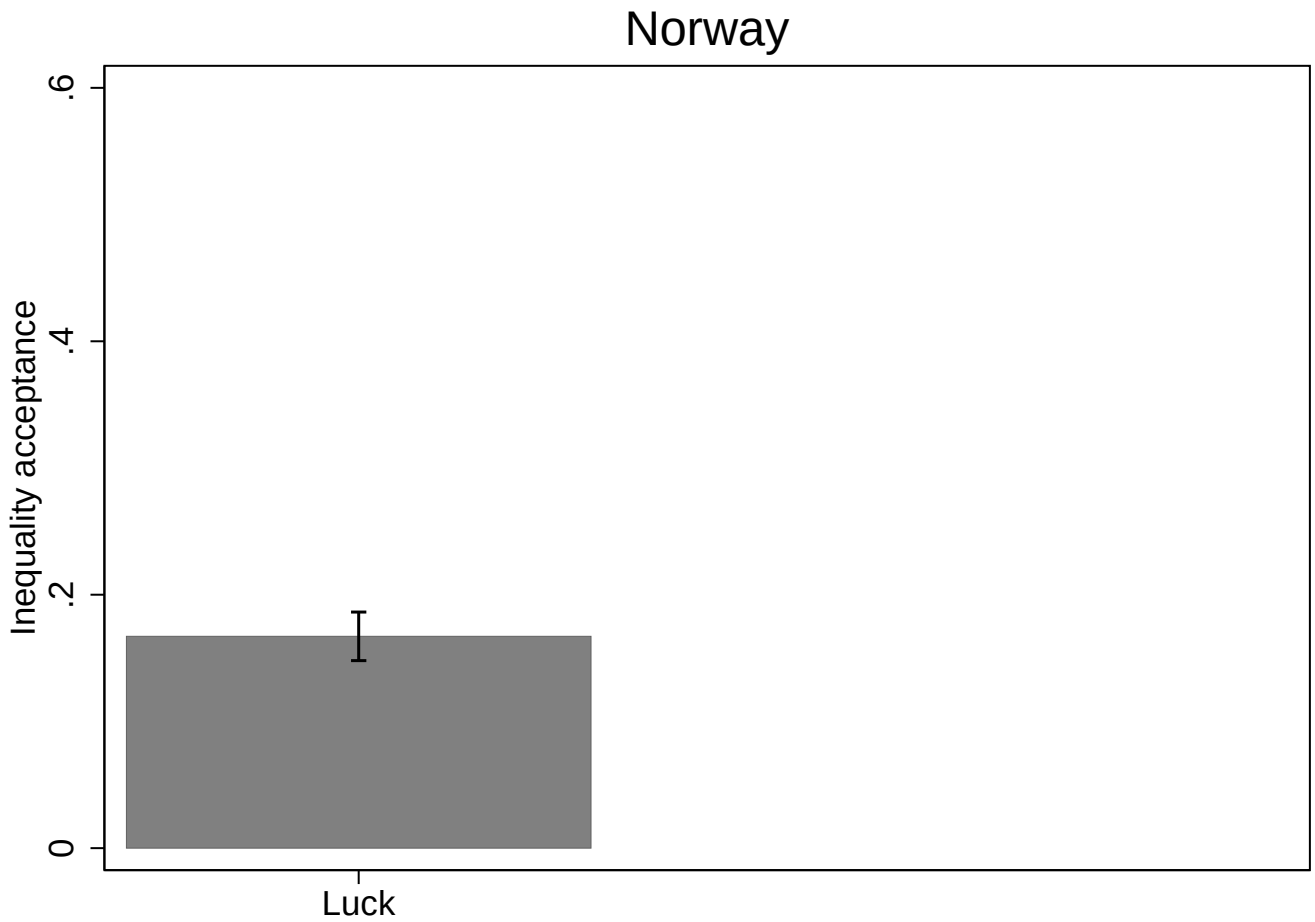
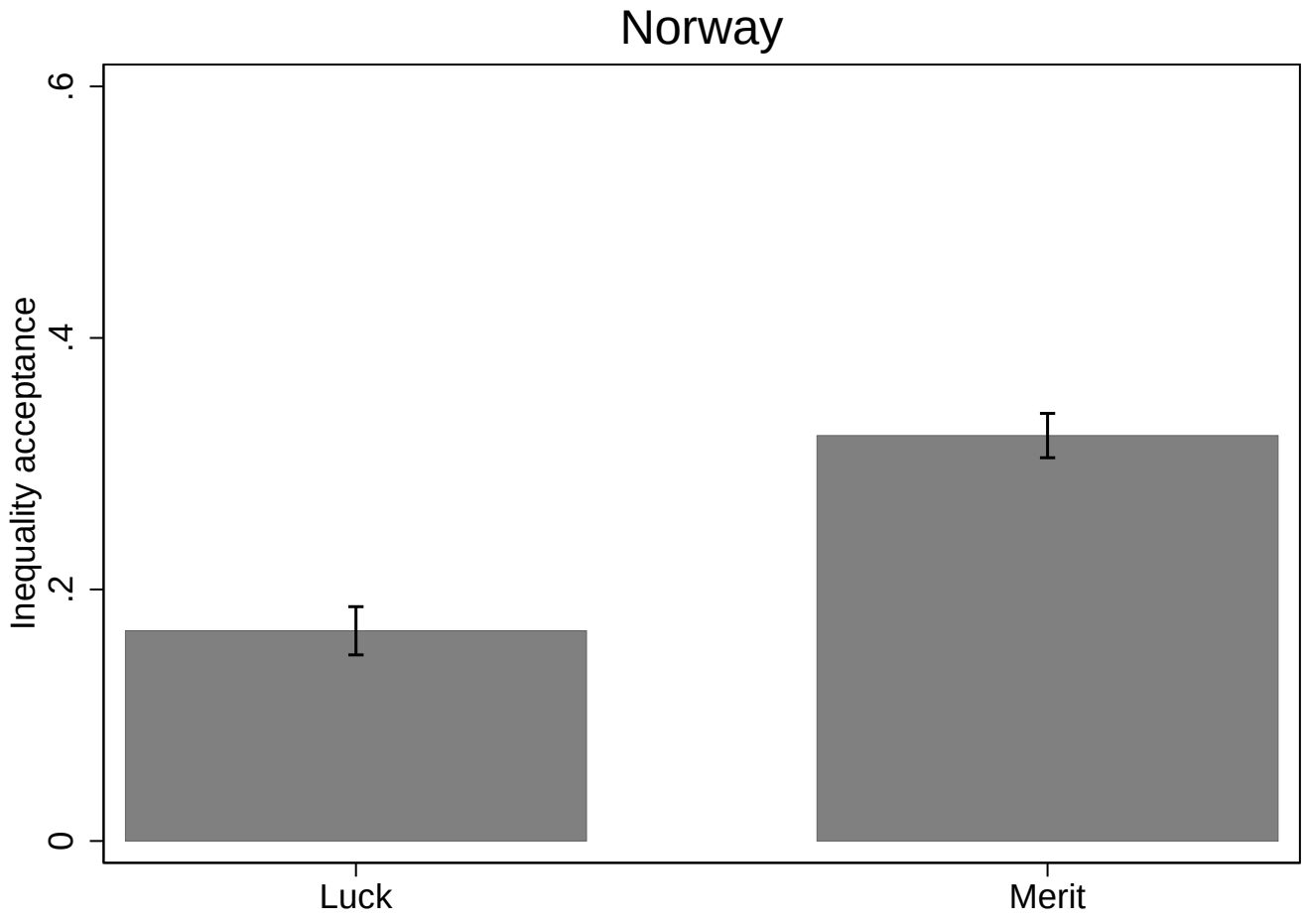


Inequality acceptance (Norway): **Luck vs Merit**



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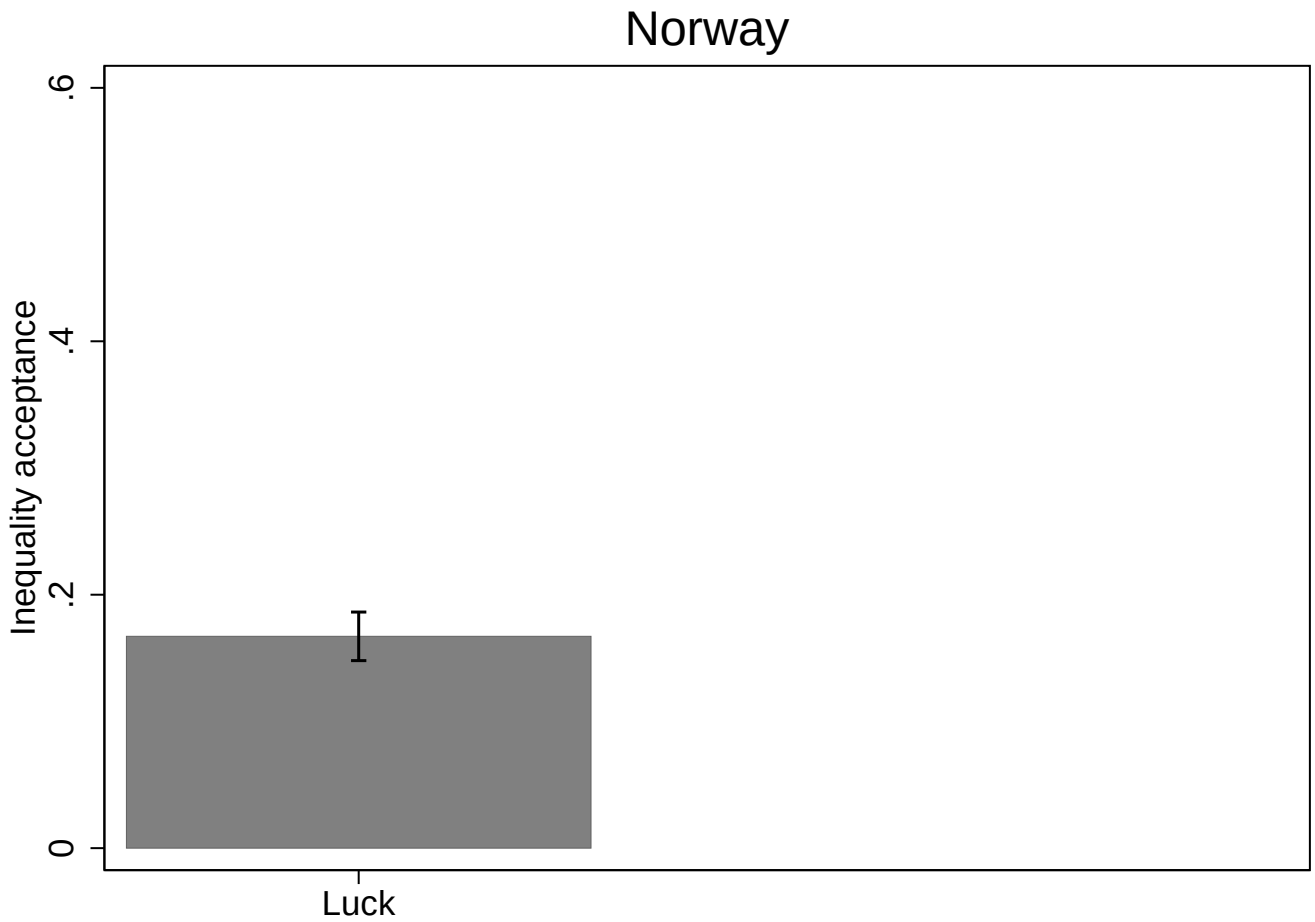

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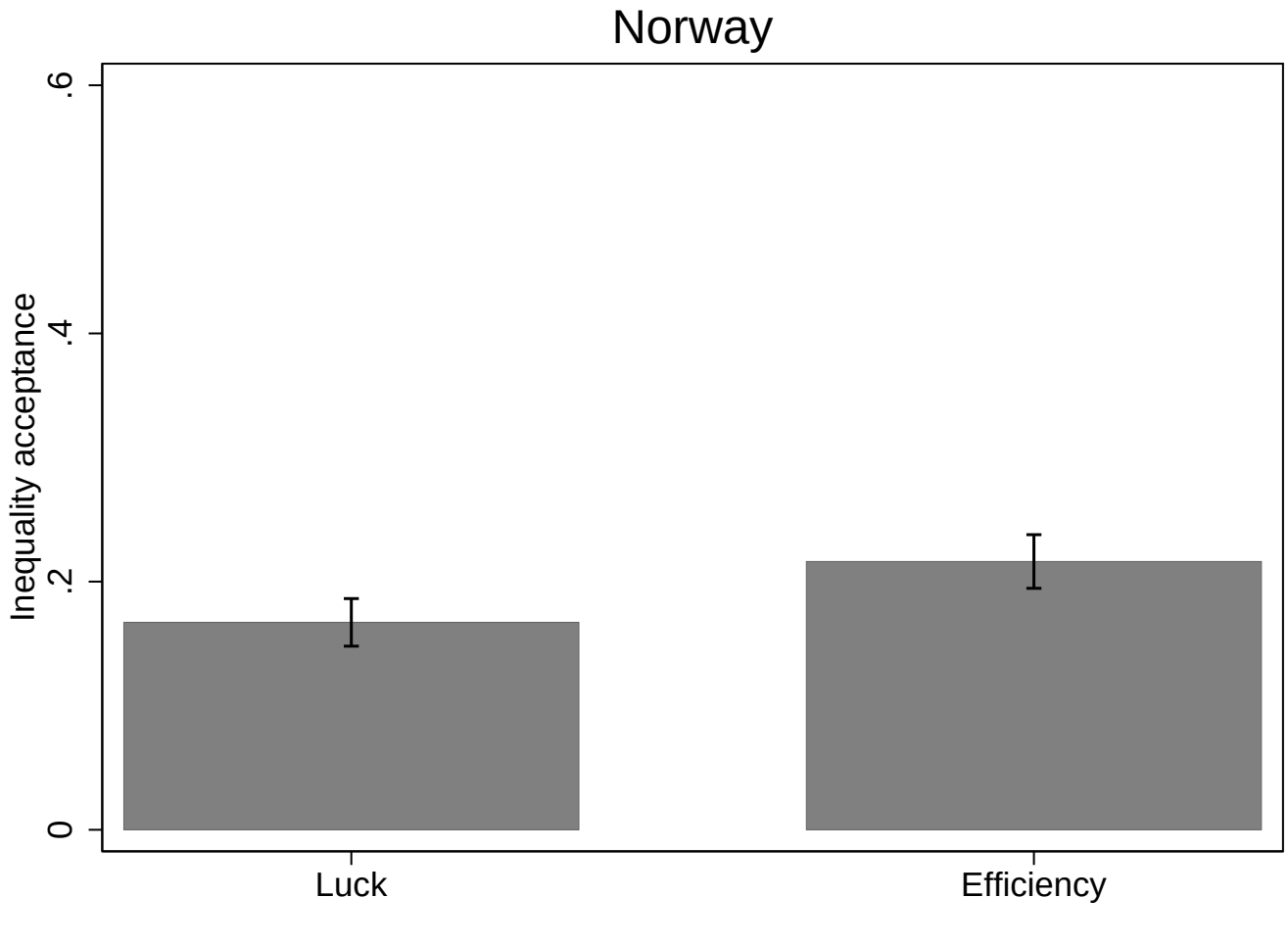

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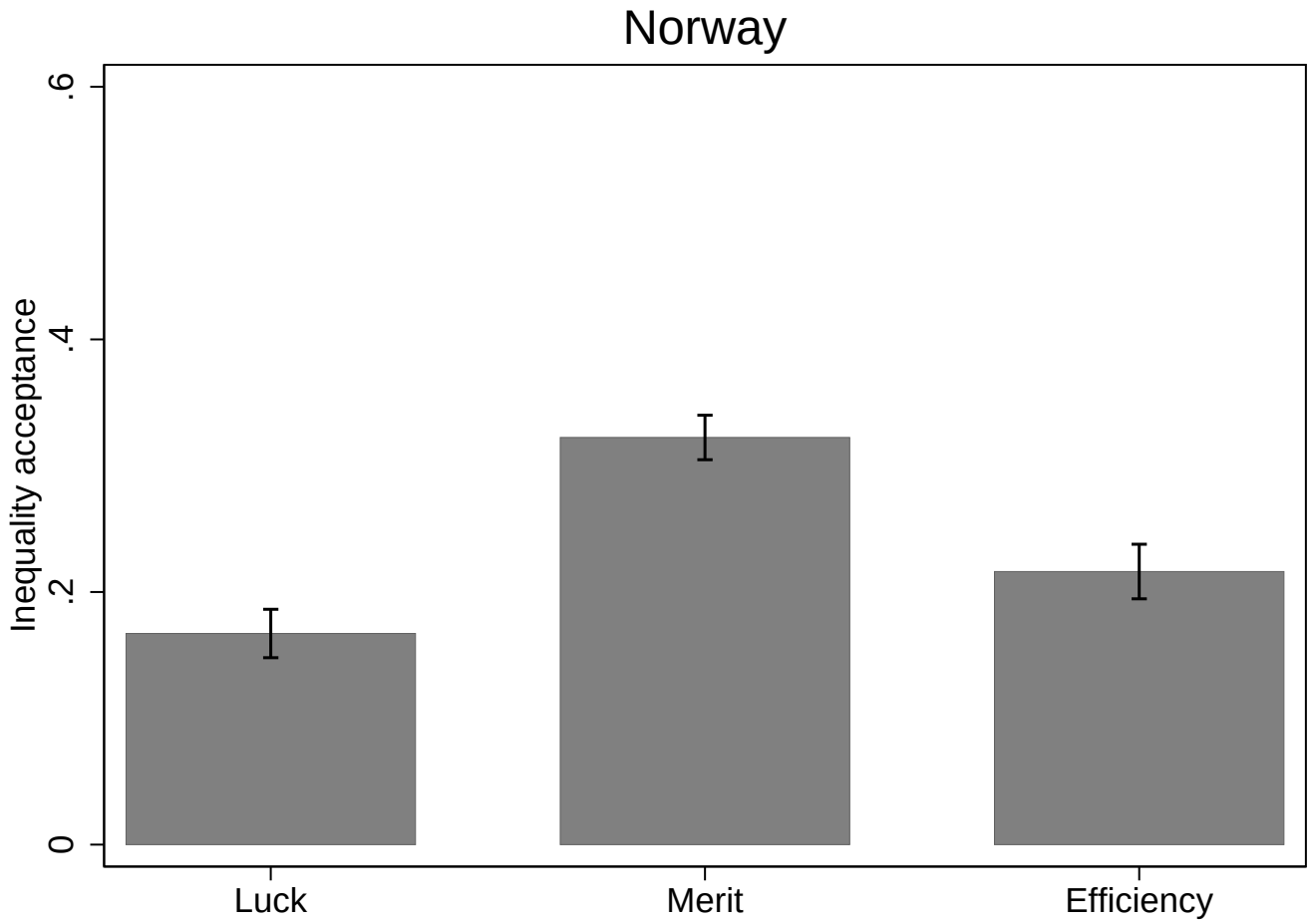
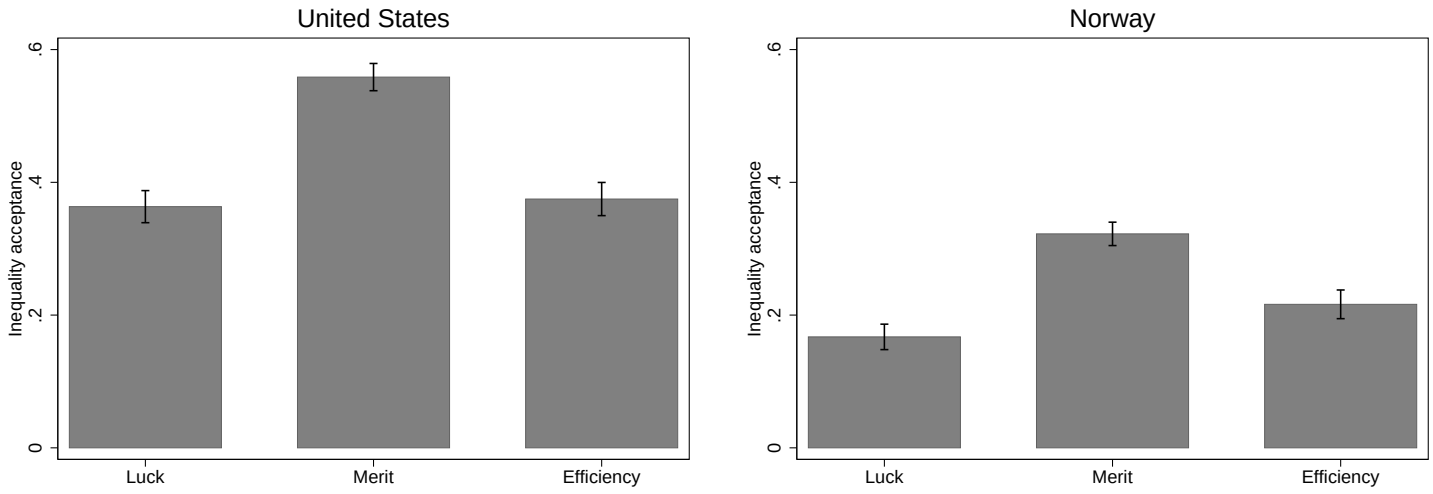


Inequality acceptance: **US vs Norway**



Regression: Empirical specification

$$e_i = \alpha + \alpha_M M_i + \alpha_E E_i + \delta_M M_i N_i + \delta_E E_i N_i + \delta N_i + \epsilon_i, \qquad (7)$$

$M_i = 1$ if in merit treatment.

$E_i = 1$ if in efficiency treatment.

$N_i = 1$ if from Norway.

Regression results

	(Coefficient)	(Standard error)
Merit (US)	0.195^{***}	(0.032)
Efficiency (US)	0.011	(0.035)
Merit x Norway	-0.040	(0.041)
Efficiency x Norway	0.038	(0.045)
Norway	-0.196^{***}	(0.031)
lincom:		
Merit (Norway)	0.155^{***}	(0.026)
Efficiency (Norway)	0.049^{*}	(0.029)

Standard errors in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Are Americans more inequality accepting than Norwegians?

Yes – we find systematically more inequality acceptance in the US than in Norway.

- Significantly more inequality implemented in all treatments in the US than in Norway.

Are Americans more meritocratic than Norwegians?

No – the merit treatment effect is not significantly different in the two countries.

- There are not more Americans than Norwegians that accept inequalities due to merit but not inequalities due to luck.

Are Americans more efficiency-seeking than Norwegians?

No – the efficiency treatment effect is not significantly different in the two countries.

- In both countries efficiency considerations seem to play a marginal role, even though the cost of redistribution is huge in our experiment.

What causes inequality acceptance?

- We show causally that **the source of inequality** is of great importance.
  - When the source of inequality is merit instead of luck, inequality acceptance increases significantly in both the US and Norway.
- We do not find systematic evidence for **efficiency considerations** increasing inequality acceptance.
  - A cost of redistribution slightly increases inequality acceptance in Norway but not (statistically significantly so) in the US.
  - May reflect our between-individual design.
- **Main observation**: We find that the source of inequality is much more important than the cost of redistribution in making people accept inequality.
  - The treatment effect difference is huge and highly statistically signficant ($p<0.01$).

Back to the theoretical framework

- How can we interpret the findings in light of our model

$$V(y) = -\beta(y - m_j)^2 - (c_j y)^2. \tag{8}$$

- **Main message**: The difference between the US and Scandinavia is related to differences in fairness view (m). No difference in the relative importance of fairness and efficiency (β); fairness much more important than efficiency in both countries.

- Let us now introduce the following three fairness views:
  - **Libertarians:** Accept some inequality when there are differences in luck or merit.
  - **Meritocrats:** Accept some inequality when there are differences in merit, but not inequalities reflecting differences in luck.
  - **Egalitarians:** Find all inequalities unfair.

Fairness views in the experiment

- We can **identify the share of each fairness type** in the experiment:
  - Libertarians: By the share of individuals not equalizing in the Luck treatment.
  - Meritocrats: By the difference in the share of individuals who divide equally in the Luck treatment and in the Merit treatment.
  - Egalitarians: By the share of individuals equalizing in the Merit treatment.

- We find that there is a **huge difference in the distribution of fairness types** between the US and Norway:
  - Much larger share of libertarians in the US than in Norway (46.5% versus 21.5%).
  - Much smaller share of egalitarians in the US than in Norway (15.3% versus 35.6%).
  - Almost same share of meritocrats in the US and in Norway (38.2% versus 42.8%).

Heterogeneity analysis

Also pre-specified in the pre-analysis plan.

- Are conservatives:
  - Generally accepting more inequalities?
  - Accepting more inequalities if they are caused by differences in merits?
  - Accepting more inequalities if redistribution is costly?
- Is there a socioeconomic gradient in social preferences?
- Is there a gender difference in social preferences?

Heterogeneity in inequality acceptance: **Political**

- Conservatives accept more inequality in general.
- Conservatives are not more sensitive to the source of inequality.
- Only in Norway are conservatives more sensitive to the cost of redistribution (but diff-in-diff not significant).

Heterogeneity in inequality acceptance:

Socioec

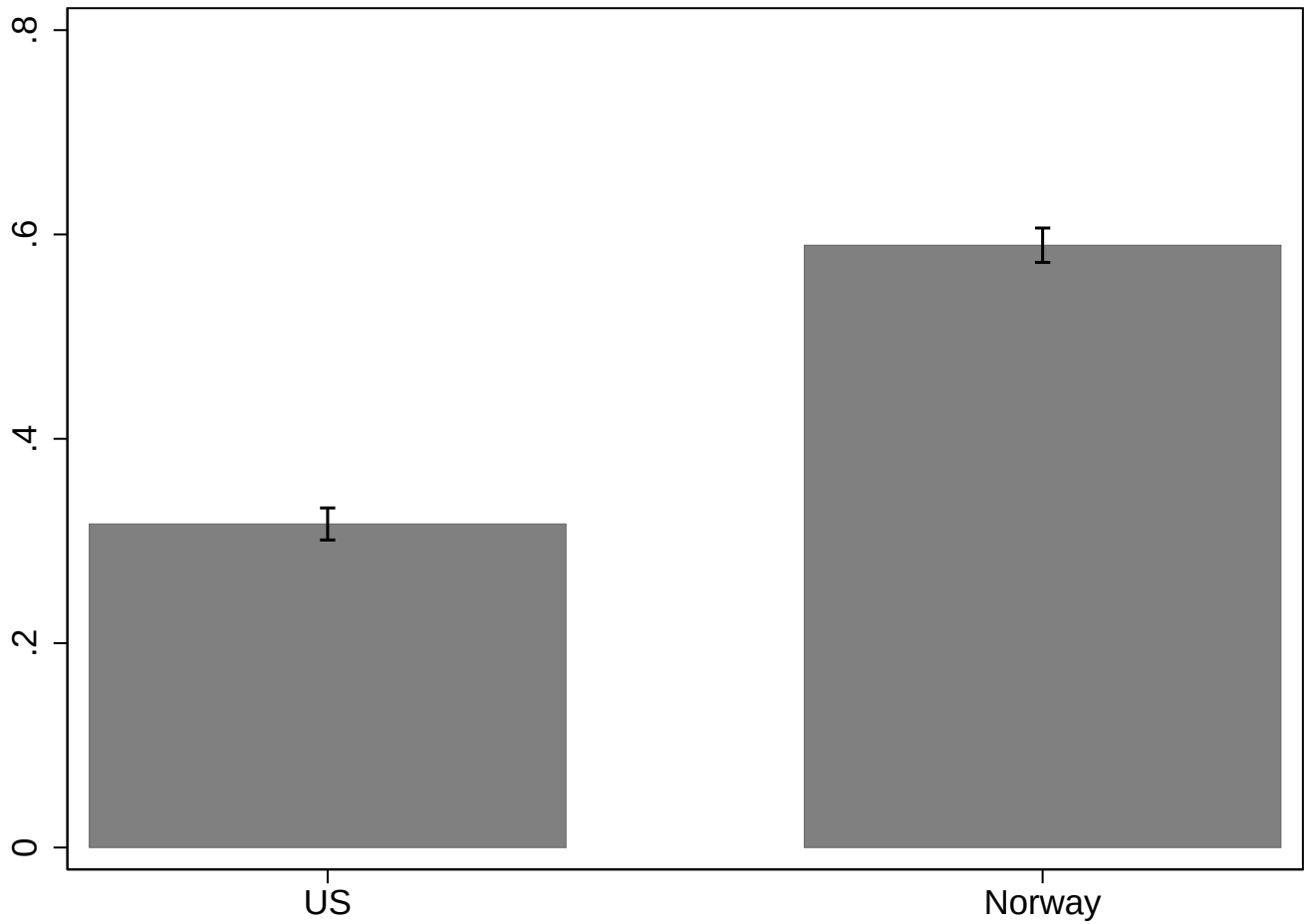
- There is no socioeconomic gradient in the acceptance of inequality in general.
- Only in the US are high income earners more sensitive to the source of inequality.
  - The socioeconomic gradient is more important to understand meritocracism in the US than in Norway.
- High income earners more sensitive to the cost of redistribution in both countries.

Heterogeneity in inequality acceptance: **Gender**

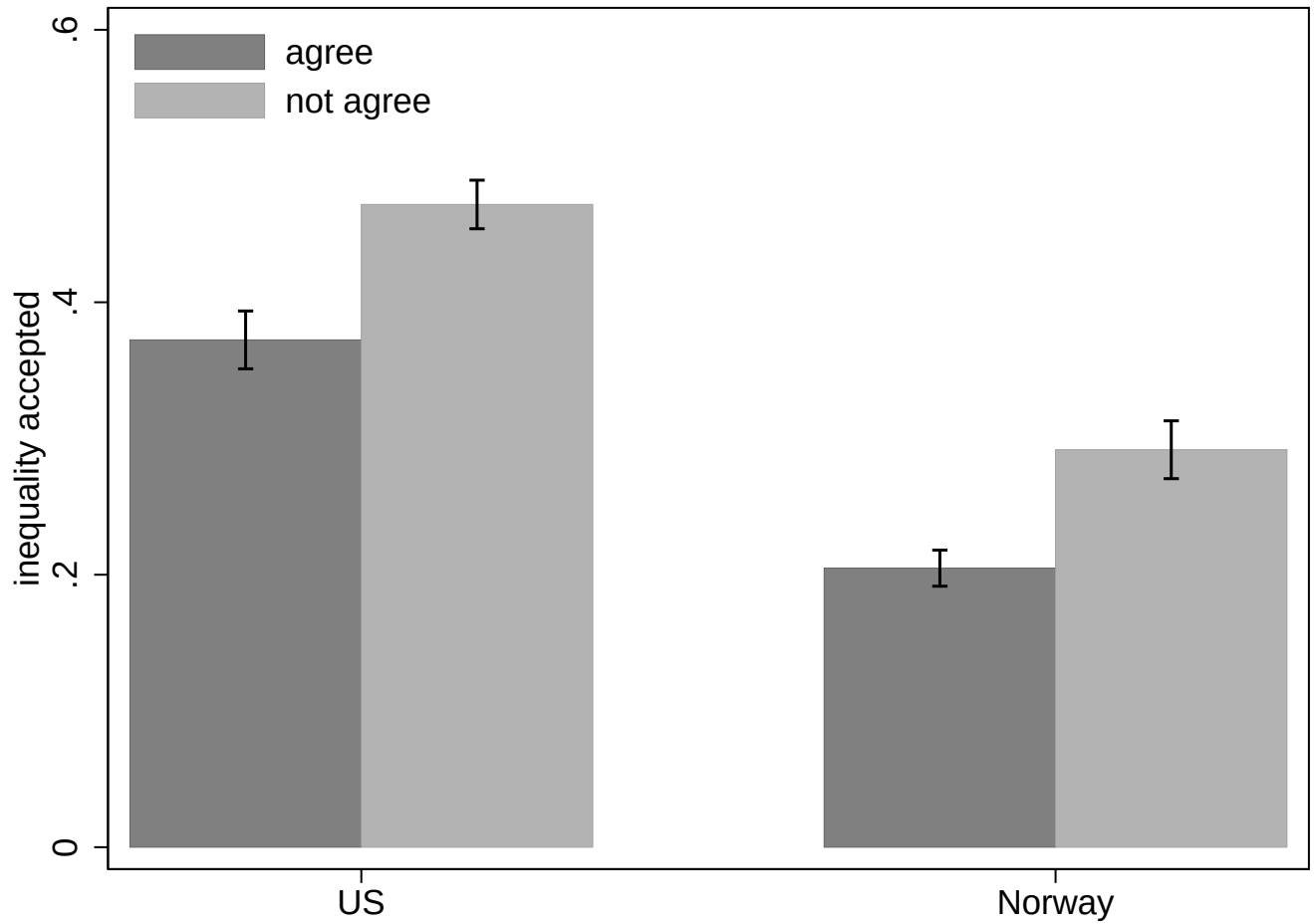
- Only in the US do males accept more inequality in general.
- There is no gender difference in the sensitivity to the source of inequality.
- Males are more sensitive to the cost of redistribution in Norway.

External validity: Experimental behavior related to inequality acceptance in society?

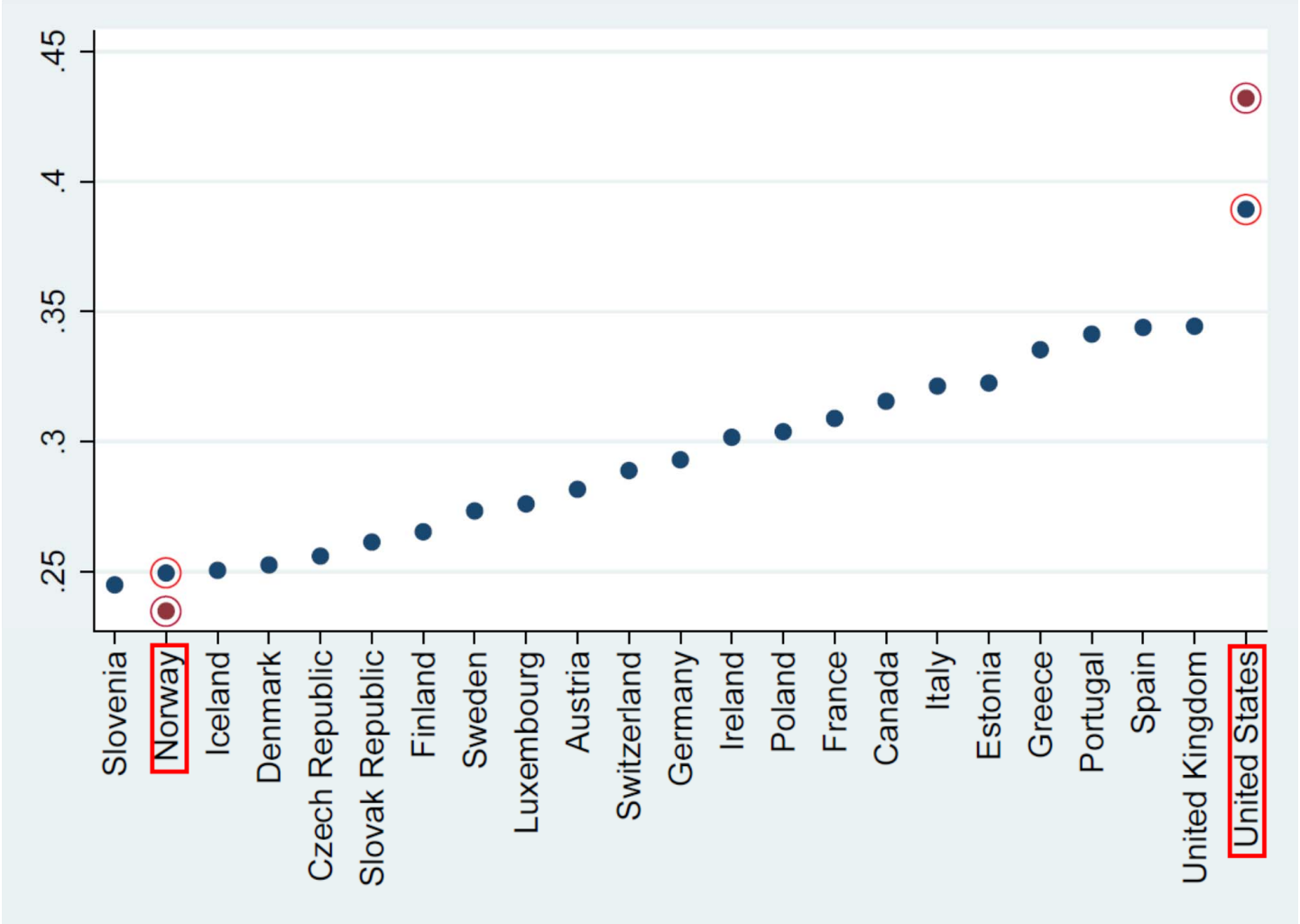
"A society should aim to equalize incomes" – share that agrees:



External validity: Inequality acceptance in the experiment strongly associated with inequality acceptance in society



External validity: Inequality levels implemented in the experiment are very close to inequality levels in society



Conclusions

- We have conducted the first economic experiment on social preferences using nationally representative samples in two countries.
  - The two countries are very different both when it comes to the level of inequality and the support for redistributive policies.
  - The participants made real distributive choices in identical situations that enable us to identify social preferences.

Conclusions: The US versus Scandinavia

Main findings I:

- Americans are systematically more inequality accepting than Scandinavians.
- We do not find that Americans are more meritocratic than Scandinavians.
  - We find the same share of meritocrats in the US and Sandinavia, but many more libertarians in the US and many more egalitarians in Scandinavia.
- We do not find that Americans are more efficiency seeking than Scandinavians.

Less support for redistribution in the US than in Scandinavia does not reflect a greater concern for efficiency, but rather differences in fairness views.

Conclusions: What leads to inequality acceptance?

Main findings II:

- Merit systematically causes increased inequality acceptance.
- The cost of redistribution does not systematically cause increased inequality acceptance.

Our study suggests that the source of inequality is more important than efficiency considerations for understanding inequality acceptance.

Robustness of main findings – looking at groups in the society (conservatives, males, high income earners)

- **Main findings I:**
  - Inequality acceptance is greater in the US than Norway for all subgroups.
  - There is no subgroup for which merit or efficiency considerations are more important in the US than in Norway.
- **Main findings II:**
  - Merit causes increased inequality acceptance for all subgroups.
  - The cost of redistribution has little effect for most subgroups.

Important how we split

When and how does inequality acceptance develop?

Significant institutional and cognitive changes from mid-childhood to late adolescence.

- **Institutional** - A striking feature of most modern societies, is how our institutions and social practices change when children enter into adolescence.
- **Cognitive** - Adolescence is also a period of important neurobiological changes in the brain,
  - the maturation of the prefrontal cortex plays an important role in the development of cognitive abilities for decision making and impulse control.

Research questions

1. Is there increased willingness to accept inequalities throughout adolescence?
    - Do they increasingly accept inequalities due to differences in production?
    - Do they increasingly accept inequalities due to efficiency arguments?
2. Is there a change in selfishness from mid-childhood to late adolescence?

Literature

- A large psychological literature on the development of social skills in children (e.g., Damon (1975;1977)),
  - Moral reasoning (hypothetical).
- Economic experiments with children (e.g., Harbaugh, Krause and Liday (2003), Fehr, Bernhard and Rockenbach (2008), Sutter (2007)).
  - Behavior in real situations.
  - Main focus on younger children.
  - Main focus has been given to research question 2.

This paper

- We study behavior in distributional situations after production.
- We introduce
  1. Self interest by allowing to take to yourself,
  2. A possible distinction between fair and unfair inequalities through a dictator game with a production phase,
  3. Efficiency considerations through a standard dictator game ('manna from heaven') with a multiplier.
- We study children from the age of 10 to late adolescence.

Main findings:

In early adolescence:

- There is a sharp increase in acceptance of inequalities due to differences in individual achievements,
- No trace of efficiency-motivated inequality acceptance.

In late adolescence:

- There is, both for males and females, a further increase in the importance of the meritocratic argument,
- We find that the efficiency argument becomes important for males earlier.

We do not find any change in the level of selfishness throughout adolescence.

Sample

We recruited 486 subjects among pupils at schools in Bergen municipality, Norway.

- Randomly sampled 20 schools.
- Randomly sampled pupils from these schools.
- Average response rate: 64 percent.
- Bergen municipality fairly representative for the Norwegian population.

Set-up

- All sessions conducted at NHH.
  - Identical set-up for all age groups.
  - Separate sessions for the different grades.
  - Mixed groups with pupils from different schools.
  - No more than 5 pupils from each school class in any lab.
  - Teachers not present.
- Double blind and real money
  - High stakes (average total payment: 233 NOK (about 30 EUR)),
  - Scaled by productivity.

Part 1: The production phase

- The production phase lasted for 45 minutes.
  - Endogenous working time: The participants could move between two web sites (on a closed network): a production site and an entertainment site.
- At the production site, the participants could earn points by doing an exercise.
  - After the production phase they were randomly and with equal probability, assigned a price of either 0.4 NOK or 0.2 NOK per point.
- At the entertainment site, they could view short videos and pictures, read cartoons or play video games.
  - Earned no money.

Oppgave

Dine poeng til nå er **6**.

Finn de stedene tallet 743 er i tabellen.

Klikk i ruten til høyre for disse tallene.

- Du få ett poeng for hvert riktige tall.
- Du blir trukket ett poeng for hvert gale tall.

Når du vil gå videre til neste oppgave, klikk på **LEVER** under tabellen.

743 ☐	743 ☐	757 ☐	743 ☐	754 ☐	877 ☐	743 ☐	757 ☐	754 ☐	739 ☐	739 ☐	492 ☐	754 ☐	395 ☐	757 ☐	877 ☐	754 ☐
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LEVER

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underholdning

Velkommen til underholdningssiden. Du kan velge mellom ulik underholdning ved å klikke på linkene nedenfor. Husk at du når som helst kan gå tilbake til siden hvor du samler poeng.

data spill

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CAPA kinoreklame presenterer godbiter fra Cannes

Fantastiske bilder

NHH

KUNSTEN Å DELE

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Internet

Part 1: The distribution phase

- The participants were anonymously matched with a sequence of other participants, and asked to propose a distribution of the total earnings in those situations.

- For each match the participants were given information about:
  - The total earnings, and the earnings for the two participants,
  - The three potential sources of inequality:
    - Working time
    - Production/productivity
    - Price

Part 2: Dictator game with a multiplier

- The participants were anonymously matched with a sequence of other participants, and asked to distribute a fixed amount of points.
    - We adjusted, in each session, the amount to be distributed in this part to correspond to the average amount that were distributed in the first part.
- The participants were informed that if they kept the points themselves, each point would be worth 1 NOK.
- If the point was given to the other participant, each point could be worth more for the other participant.
- They made choices in four such situations (multiplier equal to 1, 2, 3, and 4, respectively).

Research question 1

Does inequality acceptance develop from mid-childhood to late adolescence?

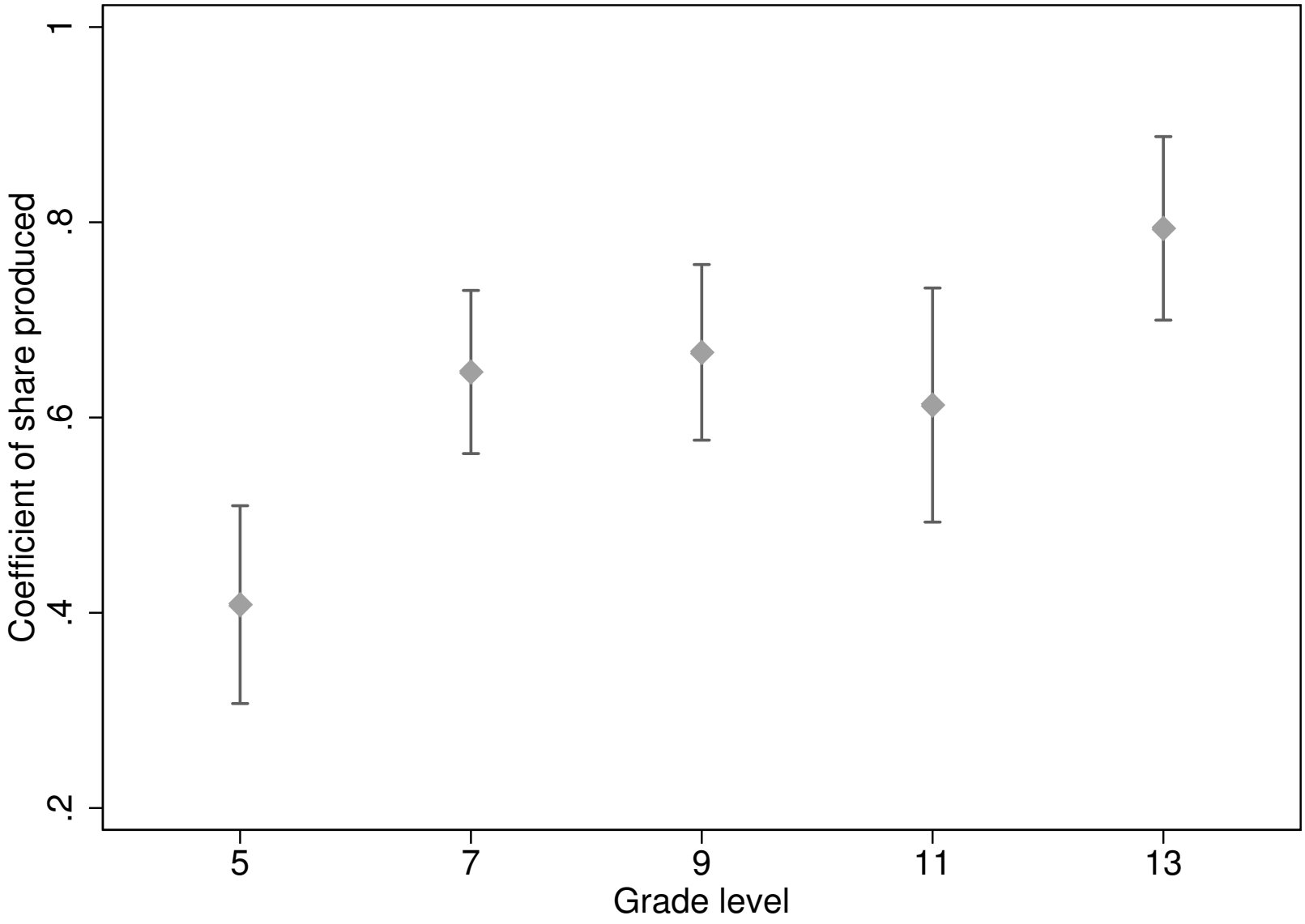


Figure: **Acceptance of inequalities due to differences in production.**

Table: Estimates of choice model

	Grade level					
	5th	7th	9th	11th	13th	all
λ^E, share of egalitarians	0.636	0.401	0.272	0.267	0.224	0.365
	(0.060)	(0.059)	(0.057)	(0.056)	(0.056)	(0.027)
λ^M, share of meritocrats	0.054	0.220	0.363	0.396	0.428	0.287
	(0.037)	(0.054)	(0.063)	(0.069)	(0.075)	(0.028)
λ^L, share of libertarians	0.310	0.379	0.364	0.337	0.347	0.348
	(0.057)	(0.055)	(0.061)	(0.059)	(0.069)	(0.026)
μ_β, mean of $\log \beta$	4.154	4.426	4.049	4.064	4.901	4.258
	(0.286)	(0.185)	(0.186)	(0.237)	(0.294)	(0.102)
σ_β, standard deviation of $\log \beta$	2.552	1.540	1.334	2.137	2.199	1.970
	(0.272)	(0.143)	(0.121)	(0.208)	(0.197)	(0.072)
γ, inverse weight on random term	2.785	3.320	3.415	3.236	1.106	2.485
	(0.184)	(0.399)	(0.481)	(0.337)	(0.074)	(0.061)
	-827.4	-881.4	-797.6	-865.0	-790.3	-4219.7

The choice model:

$$V_i^{k(i)}(y;\cdot) = y - \beta_i \frac{(y - m^{k(i)})^2}{2X}, \tag{9}$$

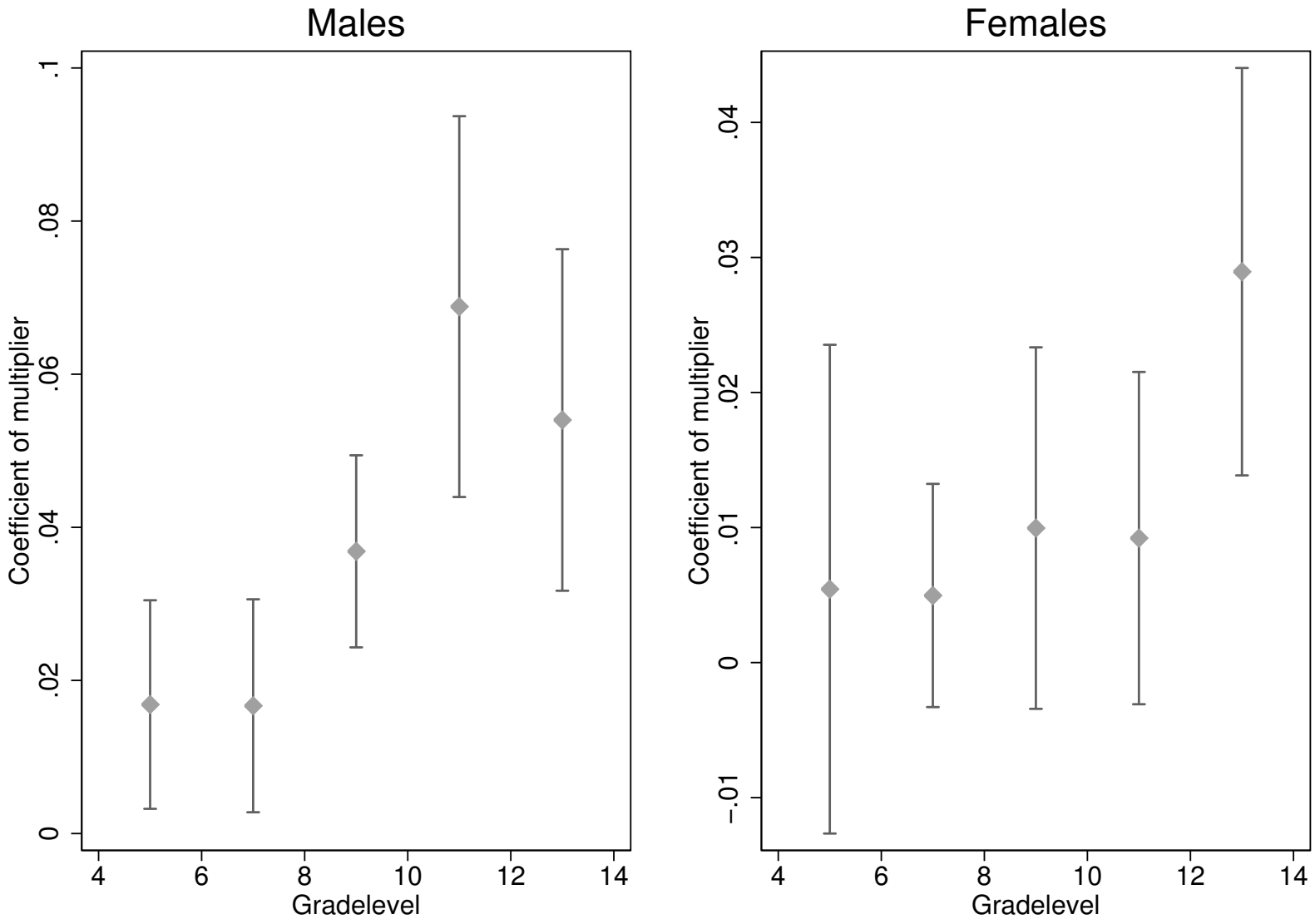


Figure: **Acceptance of inequalities due to differences in multiplier.**

Research question 2

Do children become more selfish throughout adolescence?

	Males					
Grade level	5th	7th	9th	11th	13th	All
Mean	0.422	0.449	0.466	0.435	0.448	0.444
Standard error of mean	0.020	0.017	0.013	0.027	0.028	0.009
Number of individuals	58	51	51	36	35	231

	Females					
Grade level	5th	7th	9th	11th	13th	All
Mean	0.443	0.467	0.457	0.435	0.481	0.456
Standard error of mean	0.022	0.016	0.014	0.016	0.018	0.008
Number of individuals	46	56	42	61	50	255

Table: **Summary statistics on share of total income given in the first part of the experiment, by grade and gender.**

To sum up on the development of inequality acceptance

- Inequality acceptance increases from mid-childhood to late adolescence.
  - In early adolescence, there is a sharp increase in acceptance of inequalities due to differences in individual achievements, but no trace of efficiency-motivated inequality acceptance.
  - We observe, both for males and females, a further increase in the importance of the meritocratic argument in late adolescence, whereas the efficiency argument mainly becomes important for males.
  - Self-interest seems to be equally important across all ages from mid-childhood to late adolescence (contradicts Harbaugh et al. (2007) but is consistent with the findings of Gummerum et al. (2008).)
    - Indicates that this develops earlier than the ages we are studying (also consistent with evidence from earlier research on younger

Does inequality acceptance vary by SES?

Project studying Norwegian adolescents

Almås, Cappelen, Salvanes, Sørensen and Tungodden (2016a; 2016b; 2016c).

- Large scale lab experiment,
- Data matched with data on family background,
- Follow the participants into the labor market.

Norwegian adolescents, Almås et al (2016): Fairness preferences and family background

Almås, Cappelen, Salvanes, Sørensen and Tungodden (2016a).

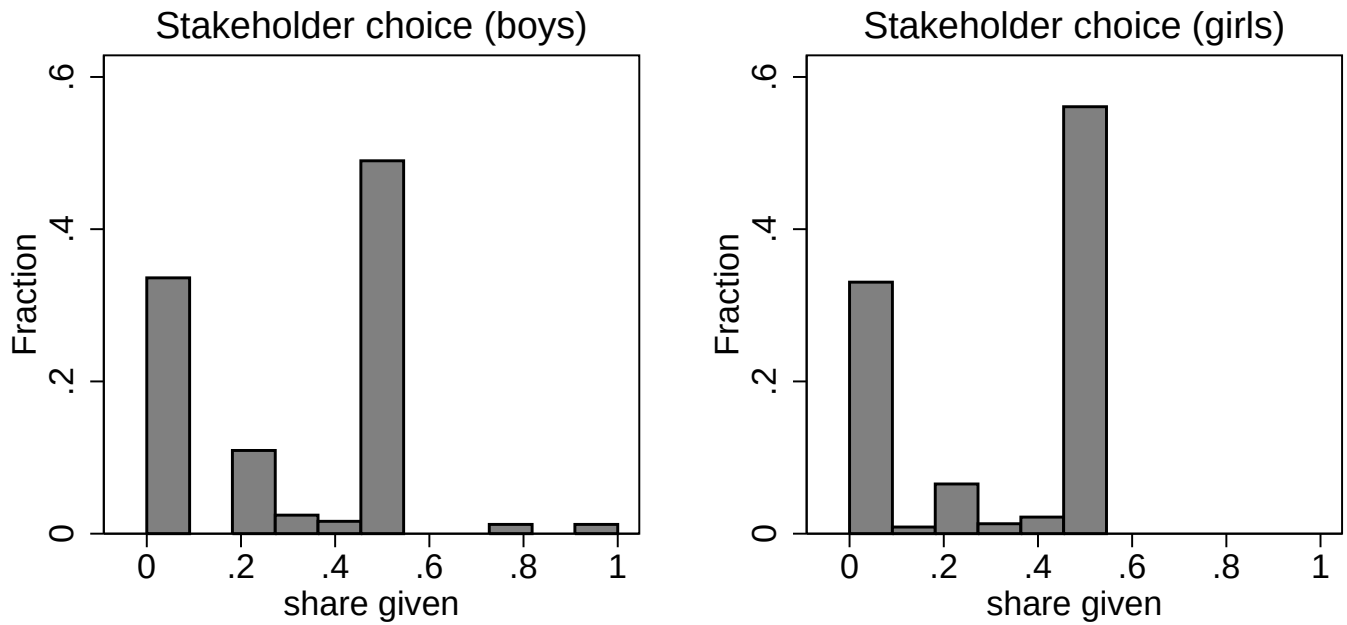
1. Production phase: count how many black squares there are in matrices (appearing sequentially).
   - Fixed payment, 50 NOK,
   - Bonus of
     - 75 NOK (if more points than the average),
     - 25 NOK (if less points than the average).
2. Distribution phase:
   - Stakeholder choice:

     Anonymously matched with another participant and choose how to distribute the sum of the fixed payments (100 NOK).

Family and gender

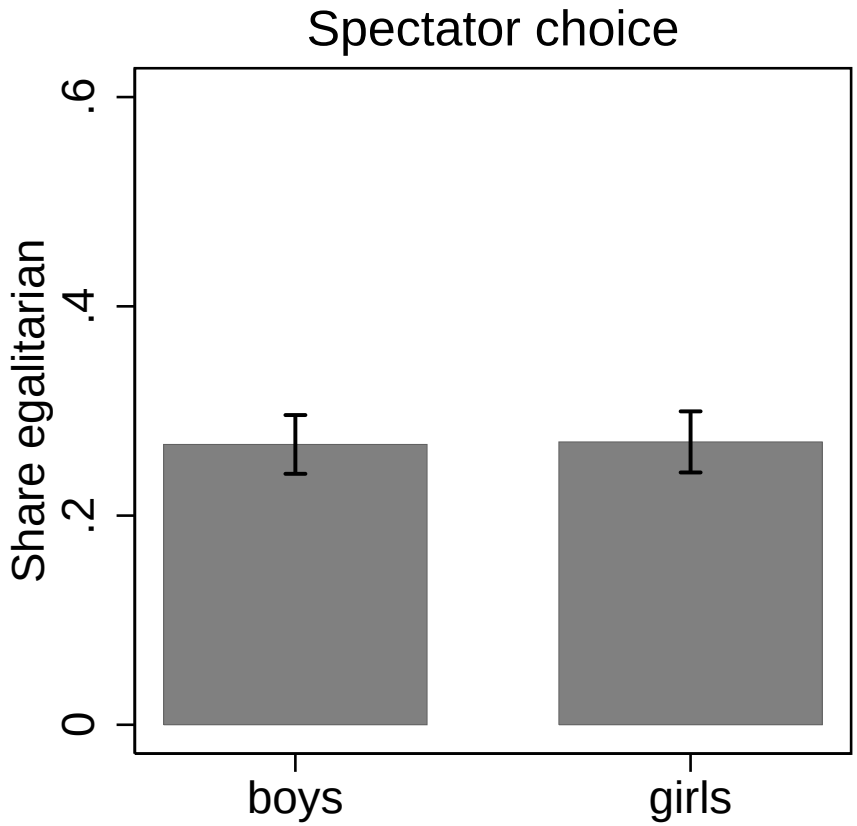
1. Does gender matter?
   - Behavior in stakeholder choice?
   - Behavior in spectator choice?
2. Does family matter?
   - Behavior in stakeholder choice?
   - Behavior in spectator choice?

Results



Almås, Cappelen, Salvanes, Sørensen and Tungodden (2016a).

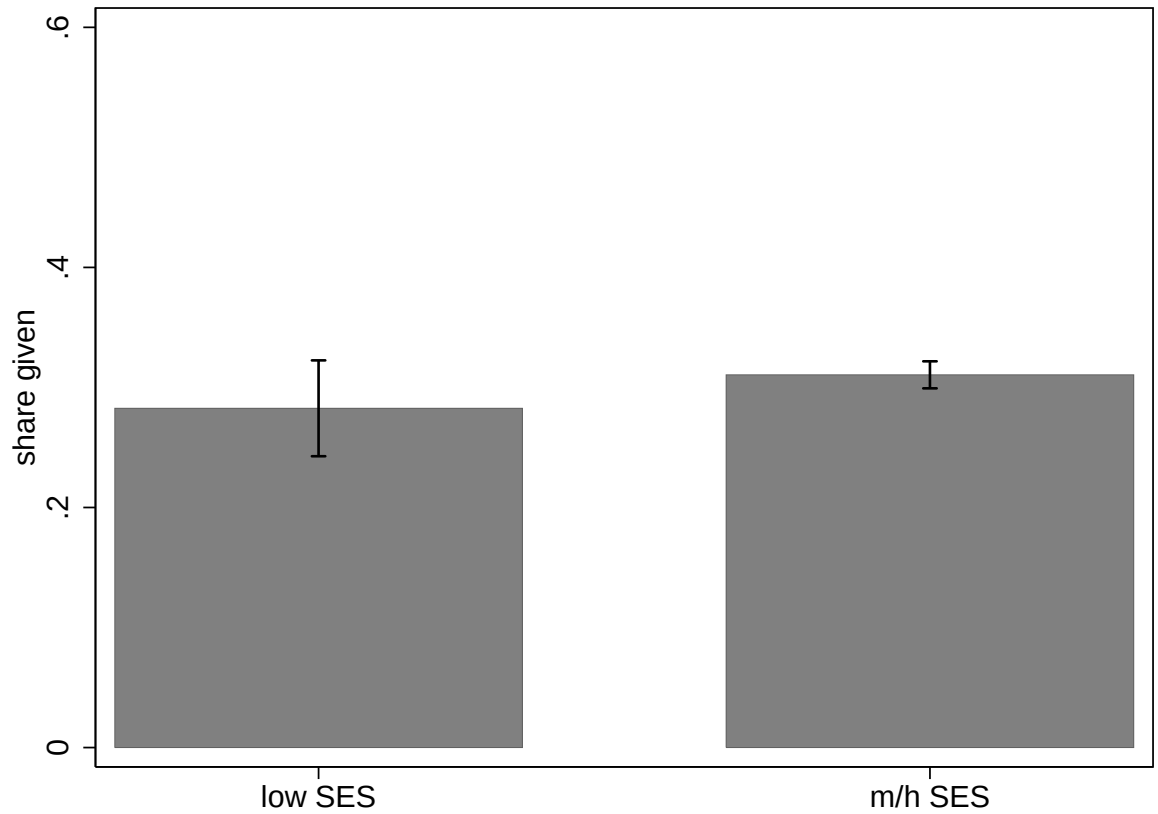
Results



Almås, Cappelen, Salvanes, Sørensen and Tungodden (2016a).

Results

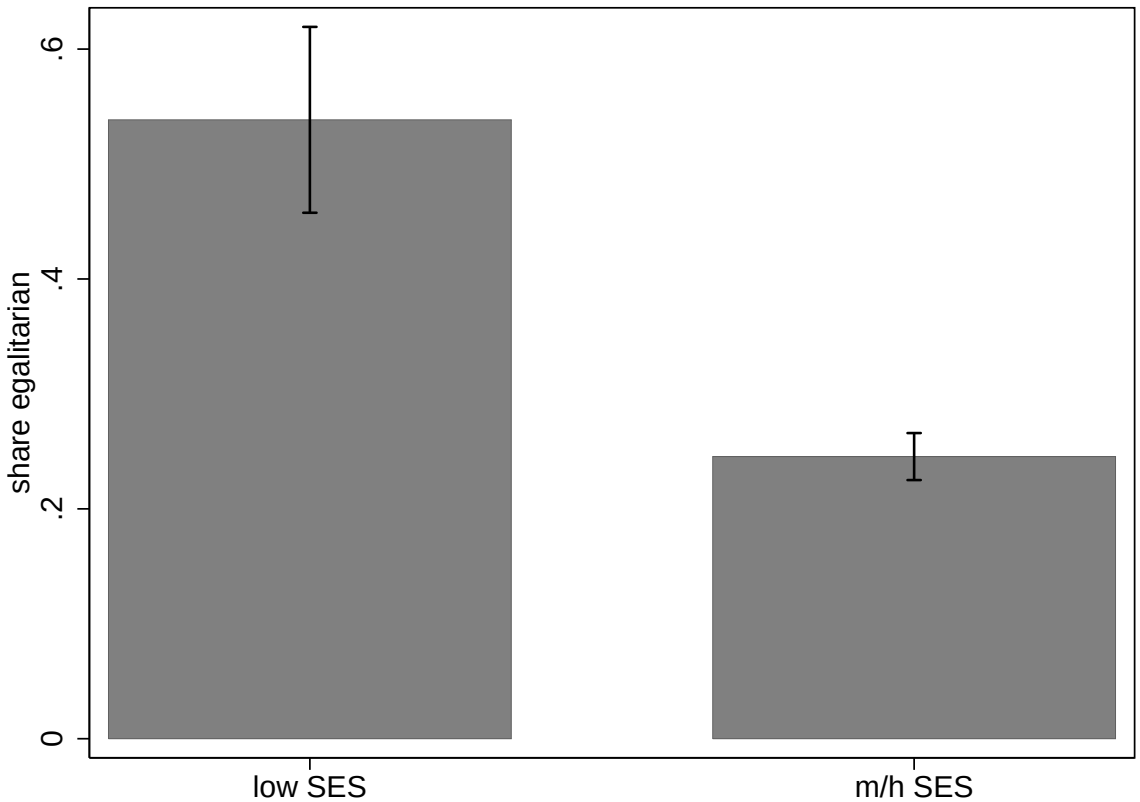
Figure 2: Differences in weight attached to fairness by SES



Almås, Cappelen, Salvanes, Sørensen and Tungodden (2016a).

Results

Figure 3: Difference in fairness views by SES



Once we know inequality acceptance, how can we measure deviations from what people (the general population or politicians) find fair?

Standard approach to income inequality

- The standard approach to income inequality considers all inequalities as unfair, and any movement towards a more equal distribution to be an improvement in terms of fairness.

- However, such a movement may take place through eliminating what many consider to be fair inequalities, and thus, may actually represent a step towards a more unfair society.

Aims of this paper

- Propose a framework for inequality measurement that allows for alternative viewpoints of what is a fair income distribution (Devooght, 2008; Cowell, 1985; Magdalou and Nock, 2011).
    - Distinguish between fair and unfair inequalities.
- Apply this approach to study the income distribution in Norway from 1986 to 2005.

Generalizing the standard framework

- *The standard Lorenz curve* is constructed by ranking individuals according to their actual income, $y_{1(\mathbf{A})} \leq y_{2(\mathbf{A})} \leq \cdots \leq y_{n(\mathbf{A})}$, where $y_{1(\mathbf{A})}$ is the person with the lowest actual income in $\mathbf{A}$, and so on.
- Define *unfair inequality* as the distance between the fair income and the actual income, $u_i^{\mathbf{A}} = y_i^{\mathbf{A}} - z_i^{\mathbf{A}}$.
- It follows that when $z_i^{\mathbf{A}} = \mu(\mathbf{A})$, where $\mu(\mathbf{A}) = n^{-1} \sum_i y_i^{\mathbf{A}}$ is the average income, the ranking $u_{1(\mathbf{A})} \leq u_{2(\mathbf{A})} \leq \cdots \leq u_{n(\mathbf{A})}$ is identical to the ranking obtained on the basis of actual income.

Axiomatic justification

- **Scale Invariance:** For any $a > 0$ and $\mathbf{A}, \boldsymbol{B} \in \Xi$, if $\mathbf{A} = a\mathbf{B}$, then $\mathbf{A} \sim \mathbf{B}$.

- **Anonymity:** For any permutation function $\rho\colon \boldsymbol{N} \to \boldsymbol{N}$ and for $\mathbf{A}, \mathbf{B} \in \Xi$, if $(y_i^{\mathbf{A}}, z_i^{\mathbf{A}}) = (y_{\rho(i)}^{\mathbf{B}}, z_{\rho(i)}^{\mathbf{B}})$ for all $i \in \boldsymbol{N}$, then $\mathbf{A} \sim \mathbf{B}$.

- **Generalized Pigou-Dalton:** For any $\mathbf{A}, \mathbf{B} \in \Xi$, where $z_i^{\mathbf{A}} = z_i^{\mathbf{B}}$ for all i, if there exist j, k such that $u_j^{\mathbf{A}} < u_j^{\mathbf{B}} \leq u_k^{\mathbf{B}} < u_k^{\mathbf{A}}$ and $u_i^{\mathbf{A}} = u_i^{\mathbf{B}}$ for all $i \neq j, k$, and $y_j^{\mathbf{B}} - y_j^{\mathbf{A}} = y_k^{\mathbf{A}} - y_k^{\mathbf{B}}$, then $\mathbf{A} \succ \mathbf{B}$.

- **Unfairism:** For any $\mathbf{A}, \mathbf{B} \in \Xi$ such that $\mu(\mathbf{A}) = \mu(\mathbf{B})$, if $u_i^{\mathbf{A}} = u_i^{\mathbf{B}}$ for all $i \in \boldsymbol{N}$, then $\mathbf{A} \sim \mathbf{B}$.

Basic result

- **Unfairness Lorenz dominance:** For any $\mathbf{A}, \mathbf{B} \in \Xi$, $\mathbf{A}$ $\mathbf{A}thbf{LD}^u$ $\mathbf{B}$ if and only if $\sum_{i=1}^{\lfloor ns \rfloor} u^{\mathbf{A}}_{i(\mathbf{A})}/n\mu(\mathbf{A}) \geq \sum_{i=1}^{\lfloor ns \rfloor} u^{\mathbf{B}}_{i(\mathbf{B})}/n\mu(\mathbf{B})$ for all $0 \leq s \leq 1$, and there exists s such that $\sum_{i=1}^{\lfloor ns \rfloor} u^{\mathbf{A}}_{i(\mathbf{A})}/n\mu(\mathbf{A}) > \sum_{i=1}^{\lfloor ns \rfloor} u^{\mathbf{B}}_{i(\mathbf{B})}/n\mu(\mathbf{B})$.
- For any partial inequality ordering on Ξ satisfying **Scale Invariance**, **Anonymity**, **Generalized Pigou-Dalton** and **Unfairism**: If $\mathbf{A}$ $\mathbf{A}thbf{LD}^u$ $\mathbf{B}$, then $\mathbf{A} \prec \mathbf{B}$.

What is the fair income distribution?

- We are concerned with fairness principles that are responsibility-sensitive in the sense that they justify inequalities due to responsibility factors, but do not justify inequalities due to non-responsibility factors.

- For any given *responsibility cut*, i.e., a partition of the set of income determinants into factors for which an individual is and is not responsible, the actual income of an individual, i, can be written as $f(\mathbf{x}_i^R, \mathbf{x}_i^{NR})$, where $\mathbf{x}_i^R$ and $\mathbf{x}_i^{NR}$ represent the vector of responsibility and non-responsibility factors respectively.

Two basic questions

- How should an individual's fair income, z_i, depend on the vector of responsibility factors, $\mathbf{x}_i^R$?
- Where should the cut between $\mathbf{x}_i^R$ and $\mathbf{x}_i^{NR}$ be drawn?

A responsibility-sensitive fairness principle I

- We apply a generalized version of the classical proportionality principle (Bossert, 1995; Konow, 1996; Cappelen and Tungodden, 2008).

- The generalized proportionality principle holds that an individual's claim is given by what would have been the average income in a hypothetical situation where everyone had the same responsibility factors as this individual.

- The claim of individual i, $g(\mathbf{x}_i^R; \cdot)$, can be written as

$$g(\mathbf{x}_i^R; \cdot) = \frac{1}{n} \sum_j f(\mathbf{x}_i^R, \mathbf{x}_j^{NR}). \tag{10}$$

A responsibility-sensitive fairness principle II

- Individual i's fair income is then given by,

$$z_i = \frac{g(\mathbf{x}_i^R; \cdot)}{\sum_j g(\mathbf{x}_j^R; \cdot)} \sum_i y_i. \tag{11}$$

- The general proportionality principle satisfies the classical minimal requirements of unfair inequality elimination and fair inequality preservation.

- There are other responsibility-sensitive fairness principles that satisfy both the minimal requirement of unfair inequality elimination and the minimal requirement of fair inequality preservation. For example, the *egalitarian equivalent* principle and the *conditional egalitarian* principle.

Drawing the responsibility cut

- If individuals are not held responsible for any factors, then the principle implies that the fair income distribution is to give everyone an equal share of the total income. If individuals are held responsible for all factors, then it implies that the fair income distribution is given by the actual income distribution.
- We take a pragmatic view on where the responsibility cut should be drawn.
    - Focus on the responsibility cut where a person is held responsible for the number of hours worked, years of education, whether he or she works in the public or private sector, and his or her county of residence.
    - How should we treat unobservable variables?

The income distribution in Norway 1986 - 2005

- Extensive database constructed by linking data collected for various administrative purposes.
  - For a subsample, we even have a direct measure of cognitive skills obtained from military records.
- Our measure of actual income is annual labour earnings.
- We restrict ourselves to persons with reported hours of work.

The labour earnings equation

- We use a linear model of the logarithm of labour earnings,

$$\log y_i = \boldsymbol{\beta} \boldsymbol{x}_i^R + \boldsymbol{\gamma} \boldsymbol{x}_i^{NR} + \varepsilon_i, \tag{12}$$

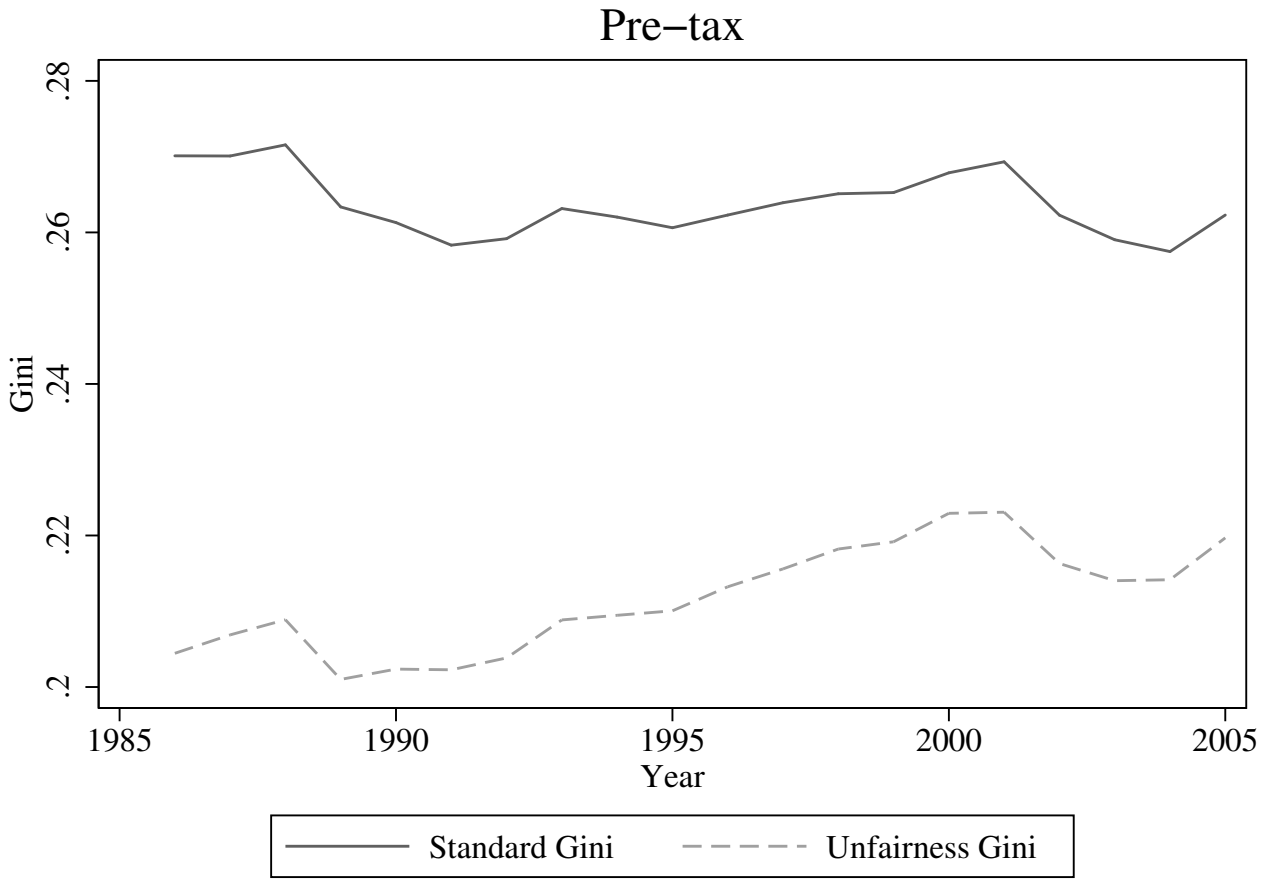
where $\boldsymbol{x}_i^R$ are the explanatory variables for which i is to be held responsible, $\boldsymbol{x}_i^{NR}$ are the explanatory variables for which i is *not* held responsible, and ε_i captures unobservable factors for which the individual is not held responsible.

The fair income distribution

- It follows from the estimated labour earnings equation that the highest fair income in 2005 was close to five times as high as the lowest fair income.
    - It is fair to give one person two and a half times more income than another who worked the same number of hours in 2005 if they differ maximally with respect to the other responsibility factors.

- Overall, the fair inequality, measured as the difference between the fair income distribution and perfect equality, decreased slightly over the period. The standard Gini for the fair income distribution fell from 0.176 in 1986 to 0.149 in 2005.

The development of the unfairness Gini (pre-tax)



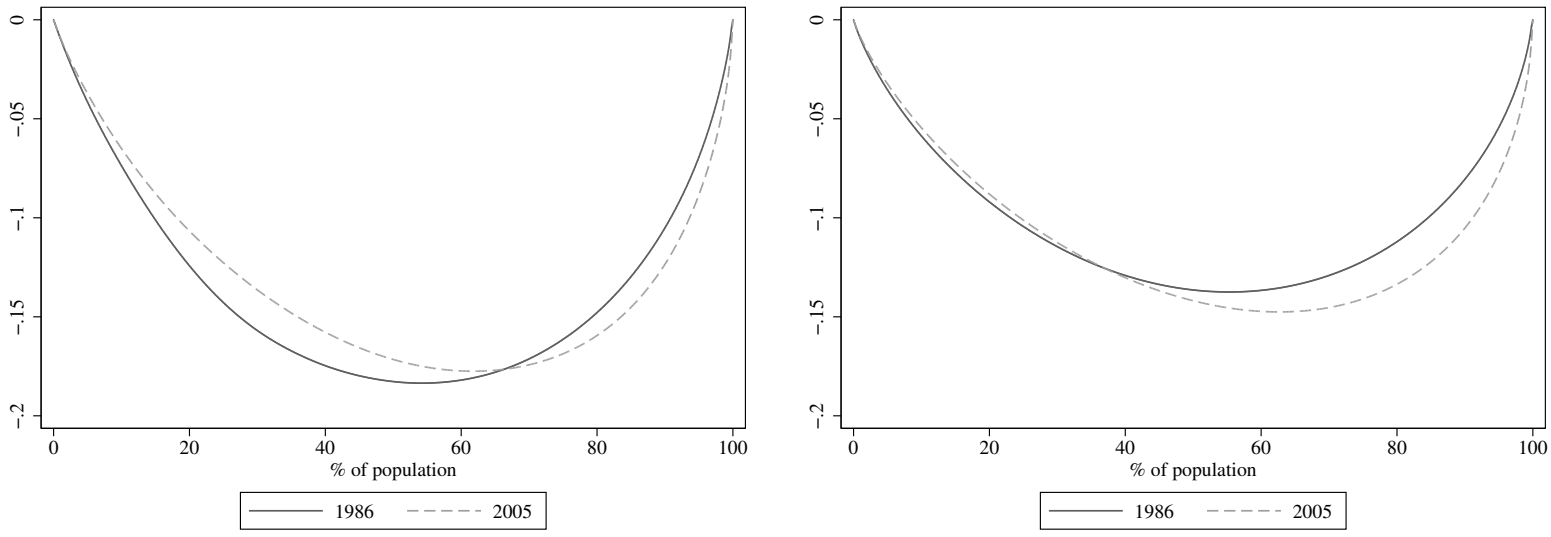
Robustness

- Different responsibility cuts
- Lorenz curves
- Different fairness principles
- Including characteristics of parents (education, county of birth etc)
- Including ability

Different responsibility cuts

	$\mathbf{A}thbfG^u$	
Responsibility set	1986	2005
$\emptyset$ (standard Gini)	0.270	0.262
$\{H\}$	0.220	0.233
$\{H, E\}$	0.204	0.228
$\{H, E, P\}$	0.206	0.221
$\{H, E, P, D\}$	**0.204**	**0.220**
$\{H, E, P, D, F\}$	0.201	0.217
$\{H, E, P, D, F, A\}$	0.200	0.214

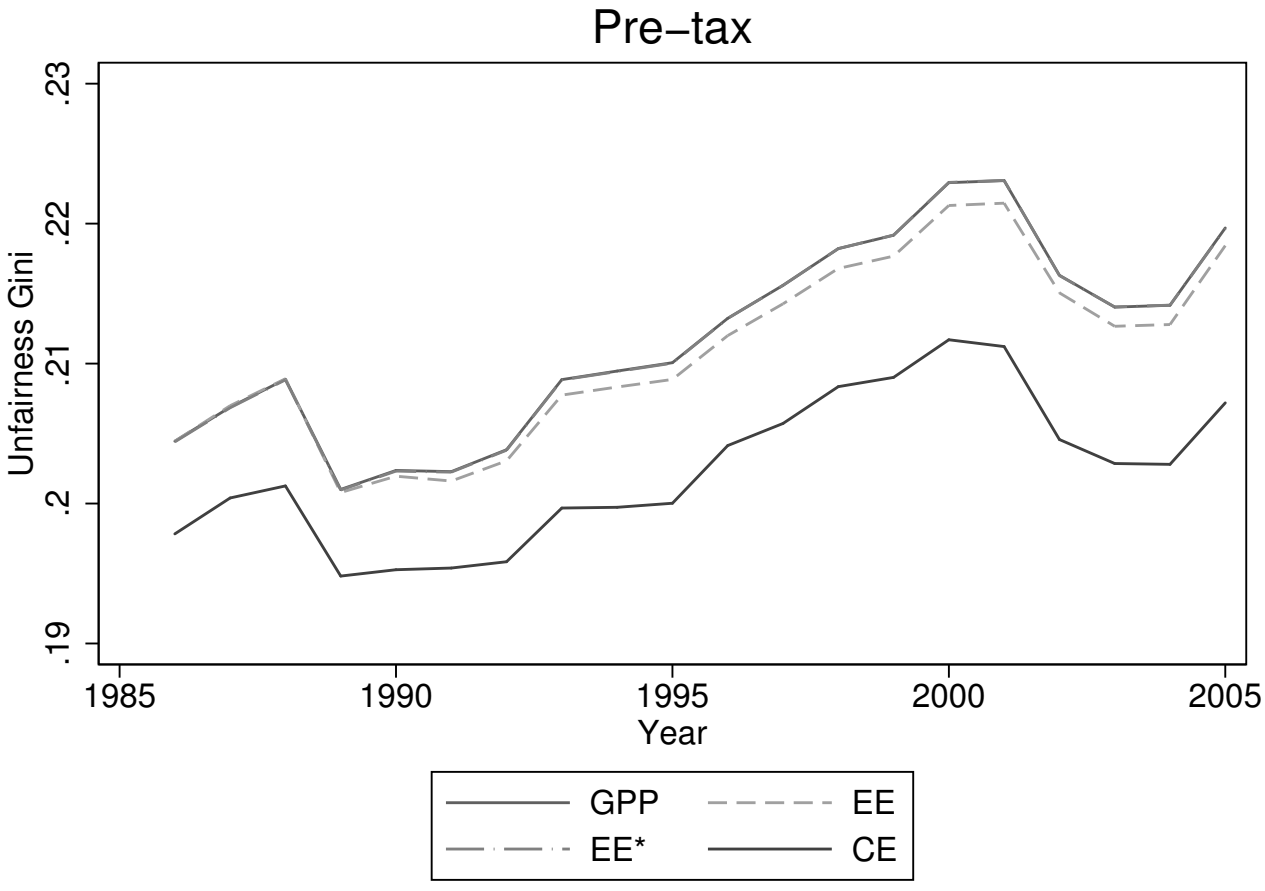
Lorenz curves



(a) Classical inequality (b) Unfairness

Lorenz curves for 1986 and 2005.

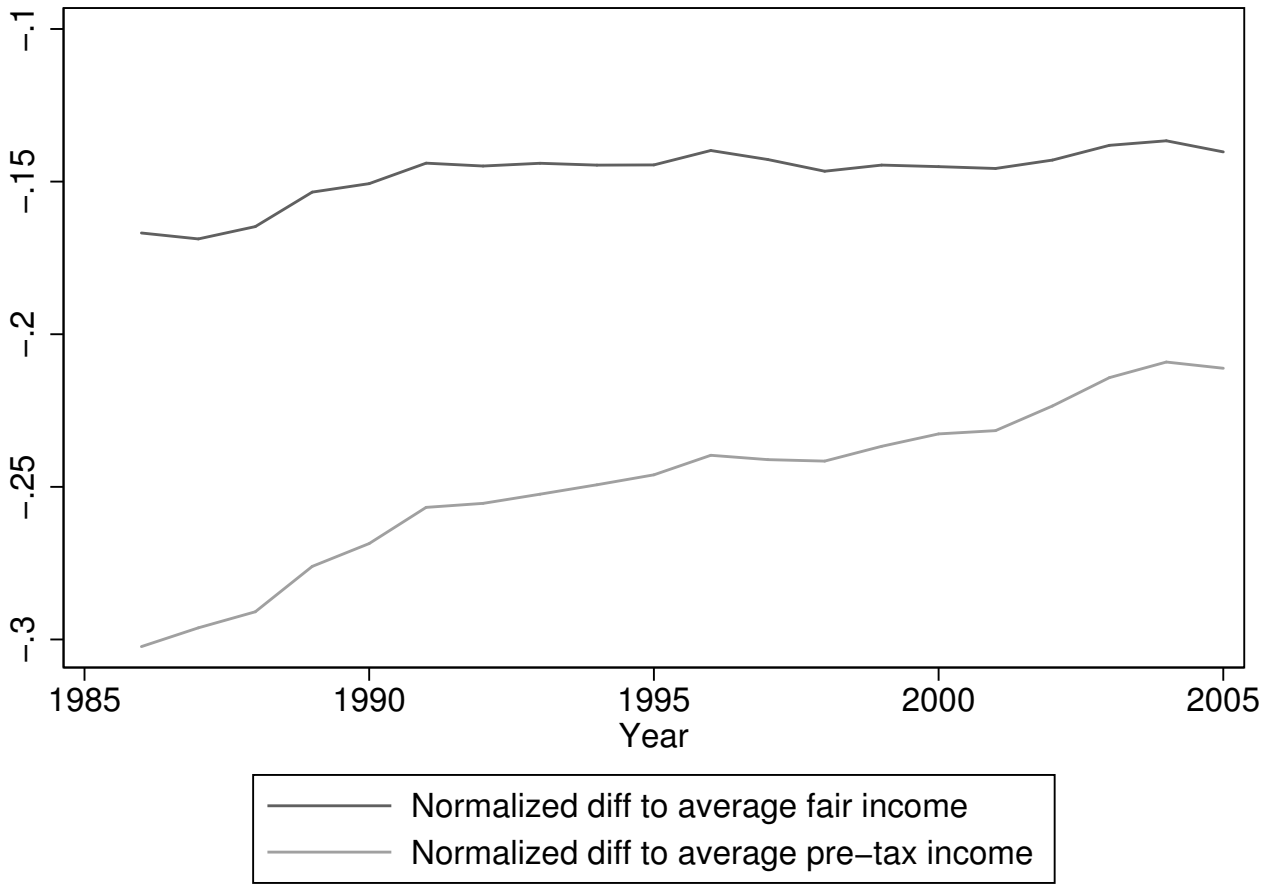
Different fairness principles



Why?

- Responsibility factors justify less inequality.
- Unobservable factors (luck etc) have become more important.
  - Greater inequality between individuals with identical responsibility factors.
  - Might be a result of increased flexibility in the the Norwegian wage setting system (Falch and Strøm, 2006).
- The unfair inequality due to observable non-responsibility factors has been rather stable.

Females and unfair inequality



Female share of fair income and labour earnings.

What about the non-observables?

Responsibility set	1986		2005	
	G^u	G^u_r	G^u	G^u_r
$\emptyset$ (standard Gini)	0.270		0.262	
$\{H\}$	0.220	0.156	0.233	0.129
$\{H, E\}$	0.204	0.116	0.228	0.104
$\{H, E, P\}$	0.206	0.121	0.221	0.093
$\{H, E, P, D\}$	**0.204**	0.117	**0.220**	0.090
$\{H, E, P, D, F\}$	0.201	0.115	0.217	0.085
$\{H, E, P, D, F, A\}$	0.200	0.112	0.214	0.076

The development of the unfairness Gini (post-tax)

	$\mathbf{A}thbfG^u$	
Responsibility set	1986	2005
$\emptyset$ (standard Gini)	0.205	0.219
$\{H\}$	0.159	0.191
$\{H, E\}$	0.158	0.192
$\{H, E, P\}$	0.157	0.184
$\{H, E, P, D\}$	**0.158**	**0.184**
$\{H, E, P, D, F\}$	0.153	0.181
$\{H, E, P, D, F, A\}$	0.152	0.178

To sum up

- It is rather straightforward to extend the classical framework also to take into account the distinction between fair and unfair inequalities.

- The classical and the responsibility-sensitive approach provide different results for the development of unfairness in Norway in the period 1986 - 2005.
  - Opposite conclusions for pre-tax income.
  - Larger increase in responsibility-sensitive unfairness for post-tax income.

A (useful?) stata command

adgini

- Adjusting for Age Effects in Cross-sectional Distributions (with T. Havnes and M. Mogstad). *Stata Journal*, 2012.
- Older or Wealthier? The Impact of Age Adjustments on Wealth Inequality Ranking of Countries (with M. Mogstad). *The Scandinavian Journal of Economics*, 2012.
- Baby Booming Inequality? Demographic Change and Inequality in Norway, 1967-2004 (with T. Havnes and M. Mogstad). *Journal of Economic Inequality*, 2011.