Swedish Institute for Social Research (SOFI)

Stockholm University

WORKING PAPER 4/2022

IDENTITY IN COURT DECISION-MAKING

by

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July 2022

Abstract

We explore the role of identity along multiple dimensions in high-stakes decision-making. Our data contain information about demographic and socioeconomic indicators for randomly assigned jurors and defendants in a Swedish court. Our results show that defendants are 15 percent less likely to get a prison sentence if they and the jurors belong to the same identity-forming groups. Socioeconomic background and demographic attributes are at least as important, and combining several identities produces stronger effects.

^{*}Thanks to Jakob Beuschlein, Julien Grenet, Erik Lindqvist, David Strömberg and Jens Wikström, and to numerous participants at the Stockholm University-MPI workshop on behavioral economics for valuable comments and suggestions. We also thank Pegah Hakuei, Cecilia Palme, Lizette Romero Niknami, Leila Sultan, Felicia Westring and Clara Östling Palme for excellent research assistance, and Johan Steinholtz at Stockholm district court for answering questions about the institutional context. The authors gratefully acknowledge financial support from Handelsbankens forskningsstiftelse.

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1 Introduction

In recent years there has been a growing awareness in the economic literature of the role of identity and social interaction for economic decisions. Research on e.g. gender pay differences and occupational choice nowadays often take into account that identity and social norms shape a person's choices in life (Akerlof and Kranton, 2000; Bertrand, 2011). In extension, identity-based decisions of one person might affect other people, a form of "identity externality". A large literature in social psychology and behavioral economics documents socialled "in-group bias", i.e. that people favor similar others in their decision-making (Tajfel and Turner, 1986; Huffman, Meier and Goette, 2006; Bernhard, Fischbacher and Fehr, 2006; Rand et al., 2009). Examples of real-world group favoritism include gender (e.g. Bagues, Sylos-Labini and Zinovyeva, 2017) and ethnicity (e.g. Glaeser et al., 2000). However, each of these traits represents only a single dimension along which identity may be shaped and therefore paints an incomplete picture of the role of identity in high-stakes decision-making.

In this paper we investigate the importance of shared identity between defendants and jurors along multiple dimensions in the context of criminal court decisions. Trial by juror is a cornerstone in most justice systems around the world, meant to ensure representation. In practice, jury groups are however typically quite small and the pool from which they are drawn is more homogeneous than society at large, meaning that the presence of in-group bias is likely to systematically affect court decisions. Still, there are few previous studies on jury composition effects in court decision-making (e.g. Anwar, Bayer and Hjalmarsson, 2012).

We collect what we believe to be the most comprehensive data set to date on identity traits. Our main data source is transcripts of court hearings in the Stockholm District Court for the period 2000-2004. From these documents we extract information about the case, defendant, judge and jurors. We link these data to longitudinal administrative registers for the whole Swedish population dating back to 1990 to get detailed background information on both jurors and defendants. These data allow us to explore similarities along both demographic dimensions, including gender and ethnicity, and socioeconomic dimensions, such as education and income. While many scholars argue that socioeconomic status is one of the most fundamental factors behind shaping identity (Easterbrook, Kuppens and Manstead, 2020), lack of data has prevented previous studies to explore its role in decision-making.¹

The detailed individual information on potential identities in our data reflects many of the attributes along which people form group affiliations in everyday life. Our results may thus

¹An important exception is Anwar, Bayer and Hjalmarsson (2022), who find that black defendants receive harsher sentences when being assigned to a jury pool from white and high-income neighborhoods.

be valid for decision-making in several other settings, such as the education sector, hiring decisions, and any type of administrative decisions by low-level bureaucrats. However, several features make the juror setting especially suitable for investigating how shared identity affects high-stakes decision-making. First, in contrast to trained profession judges, who are expected to apply the law blindly, jurors may be more likely to let identity shape their decisions. Second, since jurors are ordinary citizens, there is more variation in their background characteristics compared to judges.

Criminal cases in Sweden are decided by a judge in collaboration with three jurors. At the heart of our research design is the ability to exploit the random assignment of cases to jurors, who are drawn from a pool of eligible jurors in the district. We start by documenting evidence consistent with random assignment of cases to jurors, finding that defendant and juror characteristics are uncorrelated. This assignment procedure ensures that unobservable characteristics of defendants are the same in expectation across jurors. Any systematic differences in sentencing outcomes can therefore be attributed to juror-defendant similarities, rather than criminal case selection.

Our results show that identity is an important factor in juror decision-making. Jurors assigned to defendants who are more similar to themselves, are more lenient in their decision-making. Holding fixed the variation between individual judges, a defendant is 15 percent less likely to be sentenced to prison if assigned to a juror group where the socioeconomic background of all three jurors matches her own. The estimated effect of demographic identity is similar, which suggests that socioeconomic identity is at least as important as demographic identity for bias formation. Combining all identities produces effects that are up to twice as large as either of the single identities. Moreover, in-group favoritism is concentrated in certain social groupings, such as women and middle-income earners, but absent from others, such as men and minority ethnic groups. We show that in-group bias only exists when the defendant is present in court and when the duration of the court hearing is above the median duration in our sample, suggesting that salience of group membership enhances identification.

Our paper is closely related to the interdisciplinary literature on social identity.² These studies are primarily based on laboratory experiments. The experiments demonstrate that people are more lenient towards members of their own group (in-group favoritism), regardless of whether the group is artificially created or naturally occurring. Previous studies have also shown that in-group biases are stronger if group identity is more salient. Moreover, in-group favoritism varies with group status (Tanaka and Camerer, 2009).

²Economics: see e.g. Glaeser et al. (2000); Huffman, Meier and Goette (2006); Charness, Rigotti and Rustichini (2007); Chen and Li (2009); Leider et al. (2009); Rand et al. (2009); Fong and Luttmer (2009). Social Psychology: see survey articles by Tajfel and Turner (1986); McDermott (2009).

More recent studies use non-experimental data and show the existence of ethnic in-group bias. Shayo and Zussman (2011) use data on judges and plaintiffs from Israeli claims courts and Bar and Zussman (2019) analyze Israeli driving tests, both finding Arabic/Jewish in-group favoritism. Depew, Eren and Mocan (2017) document racial in-group favoritism between judges and defendants in juvenile courts. Sandberg (2018) uses data from the Olympic sport of dressage and finds that judges favor athletes of the same ethnicity. On the other hand, Bagues, Sylos-Labini and Zinovyeva (2017); Bar and Zussman (2019); Sandberg (2018) all study but do not find evidence of in-group bias in gender, contrasting the experimental evidence described above.

Beyond the literature on social identity, this paper is also closely related to the literature on discrimination in courts. The first strand examines the impact of defendant ethnicity for trial outcomes (Mustard, 2001; Abrams, Bertrand and Mullainathan, 2012; Arnold, Dobbie and Yang, 2018; McConnell and Rasul, 2021), consistently finding evidence of adverse treatment of ethnic minorities. The second strand documents various ways in which judge and juror characteristics affect court decisions (Peresie, 2005; Boyd, Epstein and Martin, 2010; Anwar, Bayer and Hjalmarsson, 2012, 2014; Glynn and Sen, 2015; Anwar, Bayer and Hjalmarsson, 2019a,b; Cohen and Yang, 2019). In sum, there is ample evidence showing that the identity of decision-makers and defendants, respectively, impact court outcomes.

Our main contribution is that we look at a larger set of potential identities, including socioe-conomic status, than any previous study.³ Many scholars have argued that socioeconomic background is an important attribute for decision-making (e.g. Dal Bó et al., 2017). This paper is the first to look at socioeconomic status in both the identity and the court context. Observing gender, ethnicity and socioeconomic background enables us to study identity effects in three of the main aspects along which social identity is formed, and allows us to compare their relative importance and their combined effect in the same empirical framework.

The rest of the paper is structured as follows. Section 2 provides institutional details about the Swedish court and juror system. Section 3 describes our data and Section 4 our empirical strategy. The results are provided in Section 5, and Section 6 concludes.

³Previous studies on judges that consider several identity-shaping factors have been limited to gender and ethnicity (Schanzenbach, 2005; Bar and Zussman, 2019; Lim, Silveira and Snyder, 2016), or look at quite specific contexts such as sports judges (Sandberg, 2018).

2 Institutional setting

In this section, we describe the aspects of the criminal justice system in Sweden that are most relevant for our study. We also describe the lay juror system at the Stockholm district court.

2.1 The Swedish criminal justice system

The initial phase in the justice process of a reported crime, is an investigation undertaken by the police or a prosecutor. After investigation, the prosecutor decides whether the criminal case should advance to a court trial. The criminal court system in Sweden consists of three levels: the district court, the court of appeal, and the supreme court. The vast majority of criminal cases are settled at the district court level, and each district court is generally responsible for all cases originating in its jurisdiction. When a case is taken to court, a computer algorithm randomly assigns the case to a section (rotel).⁴ Each section consists of one judge, one clerk, and administrative personnel.

Each district court also maintains a large pool of appointed lay jurors (nämndemän) who serve a similar function as juries in the American or British systems. Lay jurors are appointed to the courts for a four-year term by the municipal council after being nominated by a political party. The distribution of seats is proportional to the political party representation in the last local election. Lay jurors are not required to be politically active and every Swedish citizen over the age of 18 is eligible for nomination as a juror (with exception for employees within the justice system). Jurors are randomly assigned to criminal cases and each juror works approximately 10 to 15 days per year. The randomization process varies across courts. In the next section, we describe this process at Stockholm District court.

In most district court trials, both the verdict and sentence are decided jointly by the judge and the three lay jurors. Following the hearing, the judge summarizes the facts of the case and any relevant laws for the three lay jurors. The judge and the three lay jurors then discuss the possible decisions, including the verdict and sentence. If the judge and the lay jurors disagree on the verdict, a vote is held to determine the outcome of the case. The votes of the judge and lay jurors have equal weight, but the judge holds the tiebreaker if there is no clear majority. If a defendant is found guilty, there is a second vote to determine the sentence, with the least severe option chosen if there is an even split between different sentencing options.

⁴The computer program allows for some exceptions, including cases involving youth defendants, the least serious crimes (e.g., traffic offenses), and the most serious crimes (e.g., murder, rape). As a result, the random assignment of cases to judges occurs conditional on age and crime type in most district courts

If the severity ranking of the different options is unclear, then the judge holds the deciding vote.

2.2 Stockholm District Court

Stockholm district court is the largest court in Sweden in terms of criminal caseload. The number of reported crimes in Stockholm in the year 2000 was more than 20,000 per 100,000 inhabitants and thus more than four times higher than the national average of 4,670 per 100,000.⁵ In 2000-2004, the Stockholm district court was divided into eleven divisions. Criminal cases were distributed across four divisions (divisions 11, 12, 13 and 14), while civil cases were reserved for divisions 4, 6, 7, 9 (although these divisions could sometimes also get criminal cases). The pool of lay jurors tied to the court was made up of 600 individuals.

Lay jurors are appointed for four-year terms after local elections. Our data spans two election periods: the 1998 and the 2002 elections. After an election, the court central coordinators receive lists with names, personal identification numbers and political parties of the lay jurors. Coordinators use the lists to form triplets, with some attempt to balance gender, age, and political party. The juror triplets then work together in the upcoming four years. Triplets randomly receive a group number and are thereafter evenly distributed across divisions. Each division is allocated about 50 groups.

The central coordinators then assign groups to different court dates by going down the list of triplets in order. The head of each division assigns sections different days of the week for hearings. These two schedules are then merged and given to lay juror coordinators at each division. The schedules are updated each semester. The schedule rotates in the sense that the group number of the first triplet scheduled in the fall, follows directly after the number of the last triplet scheduled in spring. If a juror is unable to attend on a certain date, for instance due to sickness, the lay juror coordinator calls in the next lay juror on the list. While we do not have explicit data on absences, one should note that these cannot be correlated with case characteristics, since lay jurors do not get to know the day's cases before arriving at court.

Figure A2 shows the rotating schedule for division 11 in the fall of 2002. Triplet groups 1-50 were assigned to this division. For example, Triplet group 1 was scheduled to section 3 every Wednesday in September and to section 9 every Tuesday in December. This implies that group 1 was working with the same judge in a given month, but with different judges

⁵Source: The Swedish National Council for Crime Prevention, 2022. https://statistik.bra.se/solwebb/action/index (2022-03-18).

across months. Each Section had hearings two days of the week. Section 3, for instance, had hearings on Mondays and Wednesdays.

Our research strategy makes use of this random assignment of triplets to cases. Since triplets were assigned dates before they knew about the cases to be tried on those dates, unobservable characteristics of cases and defendants are similar across triplets. Evidence of successful randomization is provided in Section 4.

3 Data

To characterize trial outcomes, we assemble a comprehensive data set on juror and defendant backgrounds. In this section we briefly summarize data sources, key variables, sample construction and descriptive statistics.

3.1 Data sources and sample construction

Our empirical analysis is based on individual-level data from various sources. Our main source consists of transcripts of criminal court decisions in Stockholm District Court for 2000-2004. From these documents we extract information about the defendant(s) and the case. Defendant information includes personal identity number, country of citizenship and residential address. Case information, among other things, includes date of decision, judge name, juror names, number of defendants, the charges on which the defendant(s) was acquitted or convicted, damages requested and awarded, and the sentence. We use lists kept by Stockholm county to obtain juror political affiliations and juror personal identity number.

We link these data to several administrative registers for the whole population. Administrative data on criminal behavior is provided by Swedish National Council for Crime Prevention. The crime data include information on all court cases between 1985 and 2017, including cases that did not end in a conviction. We observe the date of the crime, the date of conviction, the type of crime committed, the sentence imposed by the court, whether there are any co-offenders and unique identifiers for district courts and defendants. Crime outcomes are available from age 15.

Administrative data from Statistics Sweden contain detailed information on family linkages contained in the multi-generation register and background characteristics from the LISA register. The multi-generation register contains the personal identification numbers for all individuals born in Sweden starting in 1932, along with the personal identification numbers

of each individual's parents and children. These data allow us to identify the children and parents of defendants, judges and jury members.

The LISA data contains rich longitudinal data that includes outcomes for every Swedish resident at least 16 years old from 1990 to 2016. For each year, the data contain demographic and socioeconomic information (e.g., age, country of origin, country of birth, gender, marital status, area of residence, education level, occupation and income measures). We use data on individualized family disposable income to calculate income percentile rank by gender and age cohorts (using a 1 to 100 scale). All values are weighted by the number of family members and inflation adjusted.

We make two key restrictions to our estimation sample. First, we restrict the sample to cases containing unique identifiers for judges and jurors. Second, we restrict the main sample to cases with non-missing information on country of origin (which excludes less than one percent of observations).

3.2 Descriptive statistics

Among the juror triplets in our sample, 43 % are men and the average age is just under 60 years old.⁶ The vast majority, 89 %, are Swedish-born, almost six % are born in other Nordic or western countries, close to four percent are born in the Middle East and just under one percent are born in Africa. Education levels are relatively high among lay juror triplets: 55 % have some form of post-secondary education and 34 % are high school graduates. Income levels are also high among lay jurors: almost 62 % have incomes above the 75th percentile in the income distribution, and less than five percent have incomes below the 25th percentile. Almost seven percent of the jurors have been convicted themselves in the past. Finally, 43 % in our triplets belong to the left-wing of the political spectrum and 50 % are appointed by right-wing parties.

Over 85 % of the defendants are male and the average age is just over 35 years. In terms of both gender and age, defendants are thus very different from jurors. While almost 36 % of defendants are foreign-born, only four percent are not Swedish citizens. Around twelve percent are born in other Nordic or western countries, 13 % in the Middle East, six percent in Africa, five % in Latin America and two % in Asia. In contrast to jurors, education levels are low among defendants. In our sample, 46 % of defendants have less than high school education, 42 % a high school education and twelve percent some post-secondary education. Income levels are equally low, with 50 % of incomes below the 25th percentile in the income

⁶See Appendix Table A2 for a full set of summary statistics for our estimation sample.

distribution and only 14 above the 75th percentile. Most defendants, 74 %, are previously convicted, and 32 % of the defendants have a prior prison sentence.

The criminal charges consist of violent offences (26 %), property offences (26 %), narcotic crimes (12 %), drunk driving (8 %), and various other offences such as traffic violations and fraud (all together 27 %). In seven % of the cases, the defendant admits guilt, and in 17 % of the cases, crimes are committed with at least one co-offender. Eight % of defendants have a pre-trial detention, 94 % of the charges result in conviction, and 23 % in a prison sentence. Average prison sentence length is about two months in the overall sample and about seven months among incarcerated defendants.

4 Research Design

Our empirical strategy rests on the fact that jurors are randomly assigned to criminal cases. Evidence of this is provided in Table 1, where observable characteristics of the jurors are regressed on a large vector of defendant and case characteristics. We look at the following five juror triplet characteristics: share of male jurors, average age, share born in Sweden, average years of education and average income rank. We run a stacked regression model, where the unit of observation is at the outcome variable-court case level, controlling for a full set of year by section and judge fixed effects. We then perform a F-test of joint significance on all coefficients, which does not reject the null hypothesis of no systematic selection of jurors to cases on observable characteristics.

Table 1: Randomization of Lay Judges to Criminal Cases.

	Coefficient	SE
Defendant:		
Male	-0.017	(0.014)
Age at crime	0.001	(0.000)
Age 18 or above	-0.012	(0.030)
Age 21 or above	-0.043	(0.021)
Foreign born	-0.009	(0.009)
Foreign citizen	0.032	(0.022)
Less than high school	-0.009	(0.011)
Post-secondary education	-0.020	(0.016)
Disposable income rank	0.000	(0.000)
Employment	-0.009	(0.012)
Convicted last 3 years	-0.002	(0.011)
Prison sentence last 3 years	-0.003	(0.014)
Defendant family (in t-1):		
Welfare payments	0.000	(0.010)
Non-single	0.006	(0.018)
Number children in house	-0.002	(0.014)
Missing in t-1	-0.011	(0.027)
Case:		
Crime confessed	-0.026	(0.018)
Violent crime	0.014	(0.014)
Property crime	0.024	(0.015)
Drug crime	0.008	(0.019)
Drive drunk	0.016	(0.020)
Observations	49,995	
Joint F-test p-value	0.331	

Notes: The stacked dependent variable contains five characteristics of the juror triplets: share male, average age, share born in Sweden, average years of education and average family disposable income rank. In the regression, each unit is a case-by-outcome observation, which gives $5\times N$ total observations. The model includes year-by-division and judge fixed effects. Standard errors clustered at judge level in parentheses in column 2.

We estimate the following regression model:

$$Y_{ijgtd} = \alpha_{td} + \gamma_g + \delta Identity_{ij}^k + \mathbf{X}_{it}\beta_1 + \mathbf{Z}_{jt}\beta_2 + \varepsilon_{ijgtd}, \tag{1}$$

where Y_{ijgtd} represents the outcome for defendant i sentenced by juror triplet j and judge g in year t and court division d. Our outcomes of interest are whether or not the defendant is

sentenced to prison. The terms α_{td} and γ_g denote year-by-division and judge fixed effects, respectively. \mathbf{X}_{it} is a vector of defendant and case controls, including gender, age, nativeborn, citizenship status, education, income and crime fixed effects. \mathbf{Z}_{jt} comprises a vector of juror triplet controls, including gender, age, native-born, education and income. $Identity_{ij}^k$ measures the extent to which observable characteristic k is shared between the defendant and the jurors. The coefficient δ thus captures the effect of shared identity on trial outcomes, conditional on defendant and juror triplet characteristic main effects.

The identity variable is constructed as an indicator for how many of the jurors that share a given characteristic k (for example, gender) with the defendant:

$$Identity^{k} = \frac{\sum_{j=1}^{3} 1[k_{i} = k_{j}]}{3}$$
 (2)

The simplest example is the variable "gender identity", which measures the share of males (females) in the juror triplet, if the defendant is male (female). It takes the value zero if the defendant is a male (female) and all three jurors are females (males) and it is one if all jurors and the defendant are males (females).

We look at similarity in four attributes: gender, country of birth, education and income. Gender and ethnicity are known to divide people into social groups and are thus obvious choices (Akerlof and Kranton, 2000). We use education and income as two indicators of socioeconomic status — a well-known factor for social divides. Table 2 lists the groups within each characteristic used to define "similarity" in the baseline specification. In Section 5 below, we discuss alternative ways to define these groups.

Table 2: Identity-Shaping Observable Characteristics

Gender	Man, Woman
Country of Birth	Sweden, Other Nordic, Other European, Other Western, Middle East, North Africa, Sub-Saharan Africa, Latin America, Asia.
Education	Less than high school, High school degree, Post-secondary education.
Income	Less than 25th percentile, Middle 50 percentiles, Above 75th percentile.

Notes: Education refers to highest attained level of education. Income is annual individualized (corrected for number of wage earners in the household) family disposable income in year before trial date, ranked within year.

As a second step, we combine the identity variables into an index measure for demographic similarities, an index measure for socioeconomic similarities, and an index measure for sim-

ilarities in all traits. We do this by simply summing over the identity variables. The first two indices take a value between zero (no shared characteristics between the defendant and the lay jurors) and two (the defendant belongs to the same group as all three lay jurors, across both characteristics) in steps of one third. The overall index instead takes a value between zero and four. Appendix Figure A1 shows there is substantial variation in the identity indices. The distribution of the overall identity index is approximately bell-shaped with a slightly longer right tail. It takes on a maximum value below four, indicating that no set of juror triplets exactly match a defendant in group affiliations. Summary statistics of all identity variables are shown in Table A1.

5 Results

In this section, we first present the main results, and then separate results by case characteristics.

5.1 Identity effects in sentencing decisions

Table 3 shows results from estimating equation 1, with a binary outcome of whether or not the defendant is sentenced to prison. Each panel presents coefficients from a separate regression, and all models include year-by-division fixed effects, judge fixed effects and defendant and juror triplet controls. Standard errors are clustered at the judge level. Panel A presents results for gender identity, ethnicity identity, education identity and income identity, while Panel B shows the results for demographic characteristics summarized into a demographic index and for socioeconomic characteristics summarized into a socioeconomic index. In Panel C, all identities in Panel A are summarized into an overall index.

Beginning with demographic characteristics, our results suggest that more lay jurors of the same sex as the defendant significantly reduces the risk of incarceration. Specifically, a defendant faced with a juror triplet who are all of the same sex as (s)he is 6.5 percentage points less likely to end up in prison, compared to if all jurors were of opposite sex. This amounts to a reduction by 28 %, indicating the presence of a strong in-group bias in gender identity, which is different from previous studies Bagues, Sylos-Labini and Zinovyeva (2017); Bar and Zussman (2019); Sandberg (2018), who are unable to establish any in-group bias in gender. A closer look at this result reveals that the effect is mainly a result of women being less prone to sentence other women to prison. In Figure 1, we split the gender identity-effect by gender of the defendant, to show that the point estimate for women is more than four

times as strong as that of men. In fact, an all-female triplet renders the risk of incarceration close to zero for women. The corresponding effect for men is weaker and not statistically significant.

Table 3: Effects of Shared Identity on the Probability of Prison Sentences.

A: Index components	
Gender identity	-0.065
•	(0.031)
Ethnic identity	-0.012
	(0.031)
Education identity	-0.033
	(0.017)
Income identity	-0.035
	(0.017)
B: Indices	
Demographic identity index	-0.038
0 1	(0.019)
Socioeconomic identity index	-0.034
	(0.012)
C: Total index	
Identity index	-0.035
	(0.010)
Outcome mean	0.23
Observations	9,999

Notes: Dependent variables is an indicator for prison sentence. Each panel contains coefficients from a regression with year times court division fixed effects, judge fixed effects, and control variables. Defendant controls: male, age at trial, age squared, indicators for age above 18 and age above 21, born outside Sweden, foreign citizenship, level of education (low/middle), income rank (low/middle) and a set of 20 dummy variables for type of crime. Juror controls: triplet mean age, share male, share native-born, share with less than high school and high school education, share with low and middle disposable income. Standard errors clustered at judge level in parentheses.

The effect of similarity in terms of ethnic origin on judicial decision-making is less clear. Our results show a weak and imprecisely estimated negative effect of ethnic identity on prison sentences. Splitting the sample by native and non-native origin of the defendant in Figure 1, we find a strong and significant effect among native-born defendants: Swedish-born jurors are more lenient toward Swedish defendants, while jurors with a non-native origin do not display the same bias. When summarizing gender and ethnicity into an index, shown in Panel B, we find that demographic characteristics together have a negative effect on the incarceration

decision ($\delta = -0.038$, se=0.019).

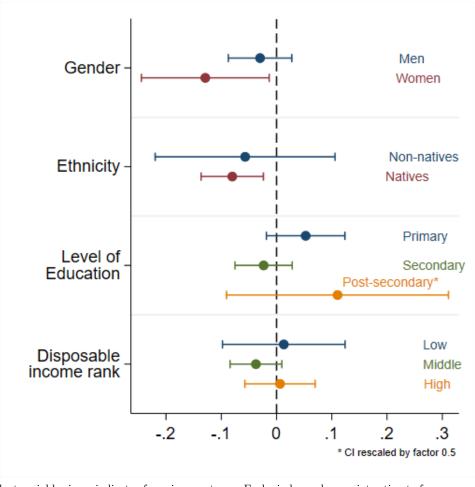


Figure 1: Heterogeneous Identity Effects

Notes: Dependent variables is an indicator for prison sentence. Each circle marks a point estimate from a regression with year times court division fixed effects, judge fixed effects, and control variables as described in Table 3, for sub-samples described by the adjacent labels. The bars mark 95 % CIs (standard errors clustered at judge level).

The next two rows in Panel A display the identity results of two measures which reflect socioeconomic status: level of education and family disposable income. They show that ingroup bias arises from both education and income. Defendants faced with a juror triplet where all members have the same educational attainments as themselves have a 14 % lower risk of incarceration, compared to an all-different triplet. Jurors are also more prone to give preferential treatment to defendants of similar income level; defendants faced with a juror triplet where all belong to the same income level as themselves have a 15% lower risk of incarceration, compared to an all-different triplet. As shown in Figure 1, the education and income identity-effects seem to be driven by those in the middle category (secondary education or middle income rank), although the estimates are not statistically significantly different. The index constructed from these two variables together is found to substantially

reduce the risk of prison ($\delta = -0.034$, se=0.012).

When we summarize all six measures of identity into a single index, the estimated effect of identity on prison sentences is a precisely estimated reduction by 15 % compared to mean incarceration rate ($\delta = -0.035$, se=0.010).

We provide a number of robustness checks for these results in Appendix Table A3. Addressing the concern that the age difference between defendants and jurors may weaken the potential for identifying with people of similar educational backgrounds, we find similar results when excluding young defendants (below age 25). When changing the treatment of missing demographic information (excluding missing values on education and income as opposed to assigning them to the "low" category), results again remain similar. We further show that the results are robust to including controls for juror political affiliation, indicating that our results are not driven by the political background of the jurors. Appendix Table A3 also shows that the results do not change when changing the definitions of sub-categories within education and income.

In Appendix Table A4, we explore whether the identity effect is nonlinear, by measuring identity with a set of indicator variables for one, two, or three lay jurors with the same characteristic as the defendant. The results suggest that the in-group bias does not increase linearly with more similar characteristics, although the confidence intervals overlap or nearly overlap. The identity effects for gender and income are strongest when going from two to three units. For education, there is an effect of a unit increase from zero to one.

5.2 Heterogeneity by case characteristics

In Table 4, we show how identity effects vary across subgroups with similar court trial and case attributes. First, we look separately at cases where identity is arguably more salient, namely trials where the defendant is present in court. As expected, the point estimates in Column 1 (defendant present) are similar to the main results, while the estimated effects of identity in Column 2 (not present) are close to zero. This indicates that similarities between jurors and defendants only influence jurors' sentencing preferences when they can actually observe the defendant in person.

Table 4: Effects of Shared Identity, by Crime and Court Case Characteristics.

	(1)	(2)	(3)	(4)	(5)	(6)
A: Court case	Present	Not present	Short	Long	Mild judge	Strict judge
Identity index	-0.038 (0.013)	-0.019 (0.023)	-0.020 (0.013)	-0.049 (0.019)	-0.035 (0.011)	-0.027 (0.017)
Demographic identity index	-0.020 (0.025)	-0.064 (0.043)	-0.029 (0.024)	-0.078 (0.038)	-0.054 (0.026)	-0.022 (0.031)
Socioeconomic identity index	-0.044 (0.016)	-0.002 (0.029)	-0.016 (0.015)	-0.040 (0.024)	-0.029 (0.013)	-0.028 (0.019)
Outcome mean Observations	$0.26 \\ 6,862$	0.10 1,219	0.16 4,489	0.33 $4,389$	$0.21 \\ 5,032$	0.25 4,967
B: Crime type	All	Violent	Property	Drugs	Drunk driving	Other
Identity index	-0.035 (0.010)	-0.061 (0.027)	-0.031 (0.023)	0.010 (0.041)	-0.062 (0.055)	-0.004 (0.014)
Demographic identity index	-0.038 (0.019)	-0.059 (0.040)	-0.017 (0.045)	-0.022 (0.082)	0.027 (0.122)	-0.055 (0.034)
Socioeconomic identity index	-0.034 (0.012)	-0.061 (0.036)	-0.036 (0.025)	0.024 (0.057)	-0.079 (0.056)	0.009 (0.015)
Outcome mean Observations	0.23 $9,999$	$0.25 \\ 2,580$	$0.19 \\ 2,565$	$0.42 \\ 1,156$	0.38 772	0.13 2,713

Notes: Dependent variable is an indicator for prison sentence. Each cell contains a separate regression, with year times court division fixed effects, judge fixed effects, and control variables. Standard errors clustered at judge level in parentheses. Control variables as described in Table 3. Columns in Panel A: 1) defendants present in person at their trial, 2) Defendants present through legal aid or convicted in their absence, 3) Court hearing lasts for 50 minutes or less, 4) Court hearing lasts for more than 50 minutes, 5) Judge has below-median incarceration rate, 6) Judge has above-median incarceration rate.

Columns 3 and 4 split the sample by duration of the court hearing, motivated by the hypothesis that longer trials enhance formation of identity effects. This is also what we find: "short" trials with a duration of 50 minutes or less (the median duration in our sample) exhibit no identity effects, while "long" trials display negative effects on prison sentences from juror-defendant similarity. The estimated effect of the overall identity index is about the same magnitude as the main estimate, when compared to the higher mean incarceration rate in the subsample ($\delta = -0.049$, se=0.019).

Next, Columns 5 and 6 present suggestive evidence of the role of the jurors in relation to the judge. For example, juror composition might effectively counterbalance a judge with a preference for stricter sentences and thus uphold some balance in court outcomes. To study this, we create a canonical measure of judge strictness (Kling, 2006; Aizer and Doyle, 2015; Bhuller et al., 2020; Dobbie et al., 2018), and divide the judges in our sample into two groups: judges with a below-median propensity of incarceration ("mild") and judges with an above-median incarceration rate ("strict"). Our results show that a favorable juror composition from the perspective of the defendant renders sentencing outcomes even more mild, beyond the effect of being allocated to a less strict judge.

In Panel B, we look at identity effects by type of crime. Column 1 displays the main result for all crime types, and Columns 2-6 look at, in turn, violent crimes, property crimes, drug crimes (use and distribution), drunk driving and all other types together (including economic crimes and traffic offenses). Evidently, the main effect of juror identity is driven by violent crime cases, and especially so for socioeconomic identity effects. For defendants accused of a violent crime, each unit increase in the overall identity index results in a reduced risk of prison by 24 %. For property crimes and drunk driving, similar effect are found, but these are too imprecisely estimated to generate significant results.

6 Conclusions

Designing judicial systems that ensure unbiased court decisions is a key objective in all open societies around the world. In this study we have provided strong evidence that identity of the jury members in relation to the defendant affects court outcomes. The finding that effects are driven by cases where the defendant is present in court and trials of longer duration enhances the credibility of the results. The magnitudes of these biases are far from negligible. For example, defendants are 15 percent less likely to get a prison sentence if they have the same socioeconomic background, measured in terms of education and income, as all three lay jurors assigned to their case, compared to if none of them have the same educational

attainments.

A similar bias is found for the demographic attributes gender and ethnicity. While previous studies in the literature have focused exclusively on demographic identities, our results highlight the importance to also account for socioeconomic factors: our findings suggest that socioeconomic identities are at least as important as demographic factors, and that considering the total effect of all potential identities produces stronger effects than only considering a single identity. We therefore conclude that studies that restrict the analysis to only one identity - such as ethnicity or gender - underestimate the importance of the multidimensional nature of how people form identities in decision-making. In extension, this suggests that similar effects would be found in other economically relevant decisions where the decision-maker and the subject interact.

Our results further suggest that in-group favoritism is limited to — or at least more prevalent in — certain social groupings, such as women and middle-income earners, but absent from others, such as men and minority ethnic groups. It is therefore not obvious that equal juror representation of all social groups would produce equality in court outcomes, even if such a system could be achieved.

⁷The gender identity effect represents an reduction by 0.011 of a standard deviation, while the corresponding effect for the overall index is 0.023. The composite identity thus produces effects that are more than twice as large as the gender identity.

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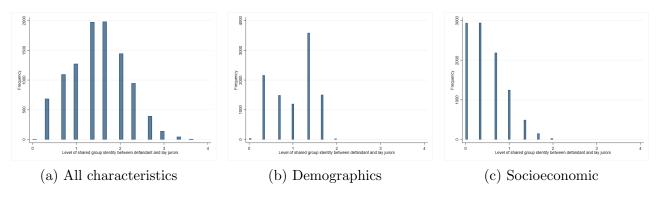
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Appendix

A Additional Figures and Tables

Figure A1: Distribution of Identity Indices



Notes: Index in Panel A constructed from gender, ethnicity, education and income. Panel B: gender and ethnicity. Panel C: education and income.

Table A1: Summary Statistics of Identity Variables.

	Mean	Sd	Min	Max
Gender	0.451	0.169	0.000	1.000
Ethnicity	0.574	0.446	0.000	1.000
Level of Education	0.248	0.278	0.000	1.000
Disposable income rank	0.218	0.292	0.000	1.000
Demographic identity index Socioeconomic identity index	$1.025 \\ 0.466$	$0.474 \\ 0.424$	$0.000 \\ 0.000$	2.000 2.000
Identity index	1.492	0.646	0.000	3.667
Observations	9,999			

Table A2: Descriptive statistics.

	Count	Mean	Sd
Lay judge triplet:			
Average age	9,999	59.586	6.775
Share male	9,999	0.430	0.162
Share born in Sweden	9,999	0.891	0.183
Share born in Other Nordic	9,999	0.034	0.107
Share born in Other Western	9,999	0.025	0.091
Share born in Middle East	9,999	0.036	0.108
Share born in Africa	9,999	0.009	0.055
Share born in Asia	9,999	0.001	0.019
Share born in Latin America	9,999	0.003	0.033
Share less than high school	9,999	0.112	0.182
Share high school	9,999	0.342	0.275
Share post-secondary	9,999	0.545	0.293
Share <25 income rank	9,999	0.047	0.121
Share middle income rank	9,999	0.327	0.272
Share ≥75 income rank	9,999	0.626	0.277
Share ever convicted	9,999	0.071	0.143
Share left-wing affiliation	9,999	0.427	0.256
Share right-wing affiliation	9,999	0.506	0.256
Defendant:			
Age at trial	9,999	35.352	12.687
Male	9,999	0.853	0.354
Born in Africa	9,999	0.055	0.227
Born in Asia	9,999	0.015	0.120
Born in Latin America	9,999	0.048	0.215
Born in Middle East	9,999	0.119	0.324
Born in Other Nordic	9,999	0.052	0.222
Born in Sweden	9,999	0.635	0.481
Born in Other Western	9,999	0.077	0.266
Education: Less than high school	9,074	0.458	0.498
Education: High school	9,074	0.418	0.493
Education: Post-secondary	9,074	0.124	0.330
Disp. income rank <25	9,620	0.508	0.500
Disp. income rank mid-50	9,620	0.351	0.477
Disp. income rank ≥ 75	9,620	0.141	0.348
Ever convicted	9,999	0.741	0.438
Ever prison sentence	9,999	0.320	0.466
Foreign citizen	9,929	0.036	0.185
Court case:			
Violent crime	9,999	0.262	0.440
Property crime	9,999	0.260	0.439

Table A2: Descriptive statistics.

	Count	Mean	Sd
Drunk driving	9,999	0.081	0.273
Drug crime	9,999	0.122	0.327
Other crime	9,999	0.275	0.447
Admits guilt	9,832	0.069	0.254
Pre-trial detention	9,930	0.080	0.271
Co-offender	9,999	0.173	0.378
Guilty verdict	9,999	0.940	0.237
Prison sentence	9,999	0.232	0.422
Sentence length (months)	9,999	1.713	6.870

Notes: Juror triplet characteristics refer to share of triplet $(0,\,0.33,\,0.66 \text{ or } 1)$ with the respective characteristic, averaged over all triplets. Sd = standard deviation.

Table A3: Effects of Identity on Prison Sentences, Specification Checks.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	All	Over 25	Non-missing	Politics	High/low ed.	Educ. rank	High/low inc.
A: Index components							
Gender identity	-0.065	-0.081	-0.070	-0.066	-0.075	-0.071	-0.071
	(0.031)	(0.040)	(0.033)	(0.031)	(0.031)	(0.031)	(0.031)
Ethnic identity	-0.012	-0.005	0.003	-0.012	-0.018	-0.016	-0.017
	(0.031)	(0.040)	(0.033)	(0.031)	(0.030)	(0.031)	(0.031)
Education identity	-0.033	-0.040	-0.030	-0.034	0.010	-0.022	-0.015
	(0.017)	(0.020)	(0.018)	(0.017)	(0.016)	(0.020)	(0.018)
Income identity	-0.035	-0.047	-0.036	-0.035	-0.034	-0.036	-0.025
	(0.017)	(0.019)	(0.017)	(0.017)	(0.017)	(0.017)	(0.012)
B: Indices							
Demographic identity index	-0.038	-0.041	-0.033	-0.038	-0.045	-0.042	-0.043
	(0.019)	(0.026)	(0.021)	(0.019)	(0.019)	(0.019)	(0.019)
Socioeconomic identity index	-0.034	-0.043	-0.033	-0.034	-0.005	-0.028	-0.021
	(0.012)	(0.013)	(0.012)	(0.012)	(0.012)	(0.012)	(0.010)
C: Total index							
Identity index	-0.035	-0.042	-0.033	-0.035	-0.013	-0.032	-0.025
	(0.010)	(0.011)	(0.010)	(0.010)	(0.010)	(0.011)	(0.009)
Outcome mean	0.23	0.26	0.24	0.23	0.23	0.23	0.23
Observations	9,999	7,513	9,073	9,999	9,999	9,999	9,999

Notes: Dependent variable is an indicator for prison sentence. Columns: 1) Whole sample; 2) Defendants aged 25 or above; 3) Defendants with non-missing income and education in the year before trial; 4) Adding political affiliation (left-wing or right-wing) of lay judges as control; 5) Coding education into two groups instead of three ("low" if vocational high school track or below, "high" if academic high school track or more); 6) Coding education into three equal-size percentile groups (low, middle high); 7) Coding income into two groups (above or below median income) instead of three. All specifications contain year times court division and judge fixed effects. Standard errors clustered at judge level in parentheses. Control variables as described in Table 3.

Table A4: Non-Linear Effects of Identity on Prison Sentences.

	(1) Gender	(2) Ethnicity	(3) Education	(4) Income
One matched	-0.061 (0.041)	0.004 (0.028)	-0.023 (0.012)	-0.008 (0.015)
Two matched	-0.077 (0.044)	-0.059 (0.039)	-0.033 (0.014)	-0.011 (0.016)
Three matched	-0.178 (0.066)	-0.049 (0.038)	-0.005 (0.019)	-0.049 (0.017)
Observations	9,999	9,999	9,999	9,999

Notes: Coefficients are from OLS regressions with a set of indicator variables for one, two or three lay judges with the same characteristic as the defendant (compared to zero), with the characteristics indicated by the column titles. Dependent variable is an indicator for prison sentence. All specifications contain year times court division and judge fixed effects. Standard errors clustered at judge level in parentheses. Control variables as described in Table 3.

Figure A2: Lay Judge Rotation Scheme

TJÄNSTGÖRINGSI AN för nundemän Augusti – december 2002 Avdelning 11

Grupp 1 - 50

Rotel	Ordinarie	Juli	Augusti	September	Oktober	November	December
	Sessionsdag		Fr o m 19/8				
3	Måndag 9.30		26	44	12	30	46
4	Måndag 9.30		27	45	13	31	47
10	Måndag 9.30		28	46	14		
1	Tisdag 9.30		29	47	15	32	48
5	Tisdag 9.30		30	48	16	33	49
9	Tisdag 9.00		31	49	17	34	50
2	Tisdag 9.00		32	50	18	35	1
3	Onsdag 9.30		33	1	19	36	2
4	Onsdag 9.30		34	2	20	37	3
8	Onsdag 9.30		35	3	21	38	4
6	Onsdag 9.30		37 obs	4	22	39	5
1	Torsdag 9.30		36 obs	5	23	40	6
5	Torsdag 9.30		38	6	24	41	7
2	Torsdag 9.00		39	7	25	42	8
9	Torsdag 9.00		40	8	26	43	9
8	Fredag 9.30	†	41	9	27	44	10
6	Fredag 9.30		42	10	28	45	11
10	Fredag 9.30		43	11	29		
Reserv	Kallas till avd 2 och 7 vid behov		12,13,14	15,16,17	30,31,32	18,19,20	21,22,23

Kontaktperson på avdelning 11 är Christoffer Dahlgren tfn 657 5529 Om du inte får tag på kan du alltid ringa växeln 657 50 00 och be att få bli kopplad till avdelningens kansli.