

Preferences for Criminal Justice Error Types: Theory and Evidence

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Abstract

What shapes individuals' preferences for criminal justice error types, that is the preferences for convicting the innocent versus letting the guilty go free? The strong correlation between preferences for criminal justice error types and incarceration rates across countries highlights the importance of these preferences. I develop an instrumental theory and an intrinsic theory of the preferences for criminal justice error types. Using individual level data from the U.S., I find support for both theories. Consistent with the instrumental theory of preferences, gender, race, and concern about crime shape preferences. Consistent with the intrinsic theory of preferences, education and ideology also shape preferences. I confirm these findings using individual level data from 22 countries, and provide some suggestive evidence that culture shapes preferences too.

1 Introduction

Economists typically take preferences as given, and focus on analyzing people's choices given preferences (Becker 1976). Traditionally, little attention has been given to the question of how preferences are formed. Yet recently

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Preferences for Criminal Justice Error Types

economists have attempted to understand what shapes certain core economic preferences.

One such example of core economic preferences are preferences for redistribution. The desire to redistribute income lies at the heart of most tax and welfare policies. Thus, a large literature in economics investigates the determinants of redistributive preferences using survey data. These studies find that redistributive preferences are affected by individuals' age, gender, race, education, income and financial self-interest (Ravallion and Lokshin 2000, Corneo and Grüner 2002, Alesina and La Ferrara 2005). Other factors that were found to affect preferences for redistribution are prospects for future income mobility (Alesina and La Ferrara 2005), personal experience of economic hardship (Margalit 2013), past experience of misfortune (Giuliano and Spilimbergo 2014), cultural factors that are very stable over time (Luttmer and Singhal 2011), group loyalty (Luttmer 2001), living under a certain economic regimes (Alesina and Fuchs-Schündeln 2007), and beliefs about fairness and equality of opportunity (Fong 2001, Corneo and Grüner 2002, Alesina and La Ferrara 2005, Alesina and Angeletos 2005).¹ Similarly, survey data has been used to analyze trends in preferences for redistribution over time for different demographic groups (Ashok et al. 2015).

Are there some core legal preferences that lie at the heart of important legal policies, mirroring the preferences for redistribution in economics? The preferences for criminal justice error types, that is the preferences for convicting an innocent person (Type I error) versus letting a guilty person go free (Type II error), can be considered such core legal preferences.

Preferences for criminal justice error types shape the legal system in various ways. As noted by Posner (1999), "Trading off Type I and Type II errors is a pervasive feature of evidence law." The standard justification for the beyond reasonable doubt standard of proof in criminal cases is that, as the leading treatise on evidence law states, "society has judged that it is significantly worse for an innocent person to be found guilty of a crime than for a guilty person to go free" (Broun et al. 2013). Similarly, Williams (1961, p. 871) notes that the philosophy underlying the rule that "a criminal charge has to be established by the prosecution beyond reasonable doubt" is "the oft quoted maxim that it is better that ten guilty person should escape than once innocent suffer." This maxim was first formalized by Blackstone

¹See a survey of the literature in Alesina and Giuliano (2011).

Preferences for Criminal Justice Error Types

(1765-1769).²

Furthermore, a large formal literature in law and economics treats the preferences for criminal justice error types as the underlying preferences shaping important legal policies. These preferences determine the standard of proof, penalties for convicted defendants, prosecutors' effort, and the use of different fact-finding procedures (Rubinfeld and Sappington 1987, Miceli 1990, Davis 1994). These preferences may explain the social desirability of plea bargaining as a screening device (Grossman and Katz 1983, Givati 2014), and whether prosecutors' discretion in plea bargaining should be limited (Reinganum 1988). The preferences for criminal justice error types may also explain why optimal fines should rise with the severity of the crime (Andreoni 1991).

Figure 1 presents data on preferences for criminal justice error types, and incarceration rates, across countries. The figure presents the share of each country's population who think that convicting an innocent person is worse than letting a guilty person go free, and the (log) number of prisoners per 100,000 people in each country. As one can see, there is a strong negative correlation between preferences and incarceration rates. The greater the share of the population who think that convicting an innocent person is worse, the lower the incarceration rate.³ This relationship between preferences for criminal justice error types and incarceration rates is consistent with the argument in the theoretical literature that these preferences shape important elements of the legal system.

What shapes individuals' preferences for criminal justice error types? I develop two theories of the formation of preferences. According to the instrumental theory of preferences, individuals derive utility from consumption. However, their consumption is affected by criminal justice errors. Individuals adopt preferences about error types that maximize their utility from consumption.

But how do criminal justice errors affect consumption? I suggest a trade-off between the personal risk of crime and the personal risk of conviction. A

²Laudan (2006, p. 29) argues that "the standard of proof, the presumption of innocence, the benefit of the doubt, and the prosecutorial burden of proof" are all intended "to ensure that such errors as do occur will be predominantly false acquittals rather than false convictions."

³In a bivariate regression, an increase of one percentage point in the share of the population that thinks that convicting an innocent person is worse is correlated with a decrease of 2.7% in the incarceration rate (p-value<0.01).

Preferences for Criminal Justice Error Types

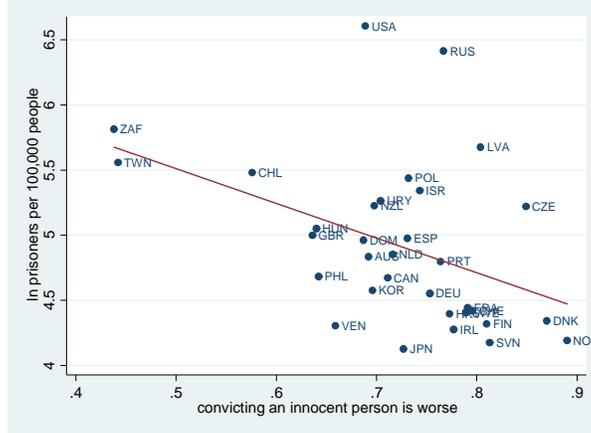


Figure 1: Preferences and Incarceration Rates

Note: Preferences are taken from the 2006 International Social Survey Program Role of Government survey. Incarceration rates are taken from the 7th edition of the World Prison Population List, the International Centre for Prison Studies.

high probability of letting the guilty go free increases the risk of crime, as fewer criminals are incapacitated. Crime reduces the individual's consumption either directly (in case of theft or robbery), or indirectly (by spending more on protection from crime). On the other hand, a high probability of convicting the innocent increases the risk of conviction to the individual. Being convicted reduces the individual's consumption. I show that an increase in the exposure to the risk of crime relative to the risk of conviction, leads individuals to prefer a lower probability of letting the guilty go free, even at the expense of a higher probability of convicting the innocent.

According to the intrinsic theory of preferences, individuals have views about the "proper" likelihood of convicting the innocent versus letting the guilty go free. These views are independent of the effect of these error types on individuals' consumption, though there could be a tradeoff between the intrinsic and the instrumental effect of preferences.

To find support for these two theories of preferences I use data from the U.S. General Social Survey. This survey asks respondents about their preferences for criminal justice error types, using the following question: "All systems of justice make mistakes, but which do you think is worse: To convict an innocent person or to let a guilty person go free?"

Using the General Social Survey data I find that women care less about convicting the innocent than men. This finding is interesting, since we gen-

Preferences for Criminal Justice Error Types

erally think that, in the U.S., women are more liberal than men. This finding may reflect the instrumental theory of preferences. Relative to men, women are exposed to a higher risk of crime than to a risk of conviction, since women are not very involved in committing crime. Therefore, if a higher likelihood of convicting the innocent leads to less crime but a higher chance of conviction, then women benefit from the former effect and are not hurt by the latter effect.

Blacks care more about convicting the innocent than non-blacks. Relative to non-blacks, blacks are more exposed to the risk of crime, but also to the risk of conviction. If a higher likelihood of convicting the innocent leads to less crime but a higher chance of conviction, then blacks benefit from the former effect but are hurt by the latter effect. Therefore, under the instrumental theory of preferences, it is unclear whether blacks should care more or less than non-blacks about convicting the innocent. That blacks care more about convicting the innocent may be an indication that what is driving their views is their concern about being convicted rather than their concern about crime.

Education is positively correlated with a greater concern about convicting the innocent. There seems to be no instrumental reason why more educated people, who are generally less involved in committing crime, and therefore less exposed to risk of conviction, would care more about convicting the innocent. It seems more plausible that this relationship reflects the intrinsic theory of preferences. Educated people may care more about convicting the innocent because they have been educated to believe so.

Respondents' ideology, and specifically their level of liberalism, is positively correlated with a greater concern about convicting the innocent. The relationship between ideology and preferences seems to reflect the intrinsic theory of preferences. Immigrants care less about convicting the innocent than non-immigrants do. This difference could be the result of the different preferences in immigrants' country of origin, and the persistence of these preferences following immigration. Such persistence indicates that culture also shapes preferences, consistent with the intrinsic theory of preferences.

There is a negative relationship between respondents' concern about crime and concern about convicting the innocent. This reflects the instrumental theory of preferences, as a greater exposure to the risk of crime leads to a greater willingness to bear the risk of conviction in order to reduce the risk of crime. Lastly, commitment to always obeying the law is negatively correlated with concern about convicting the innocent. This seems to reflect the instrumental theory of preferences, as people who always obey the law

Preferences for Criminal Justice Error Types

are less exposed to the risk of conviction.

To confirm my findings I use data from the International Social Survey Program, which cover 22 countries. These data include respondents' preferences for criminal justice error types, based on the same question noted above for the General Social Survey.

Generally speaking, the same relationships that were found in the U.S. using the General Social Survey data can also be seen across countries in the International Social Survey Program data. Specifically, women care less than men about convicting the innocent, and education is positively correlated with concern about convicting the innocent. Additionally, there is a negative relationship between concern about crime and concern about convicting the innocent, as well as between commitment to always obeying the law and concern about convicting the innocent. Lastly, as in the U.S., ideology matters, and support for parties on the left is positively correlated with a greater concern about convicting the innocent.

Legal scholars often assume that "virtually everyone agrees that convicting an innocent person is a more costly mistake than acquitting a guilty one" (Laudan 2006, p. 1). Most "simply treat it as a self-evident truth" (Epps 2015, p. 1069). Of the scholars who offer a reasoning for this traditional view, some provide a utilitarian justification (Posner 1999, p. 1504; Solum 1994, p. 701; Laudan 2006, p. 69; Lippke 2013, p. 387). Others argue that convicting the innocent is more morally disturbing (Dworkin 1985, p. 80-81; Fallon 2008, p. 1706; Stein 2005, p. 174-175). Some scholars have criticized the excessive attention given by legal scholars to false convictions, while other harmful mistakes, such as false acquittals or unsolved crimes, are disregarded (Allen and Laudan 2008). Recently, Epps (2015) has argued that convicting the innocent may not be worse than letting the guilty go free, since the systematic effects of such a position may be detrimental to the innocent. This resulted in a debate on the issue, with the traditional view being defended as promoting equality (Johnson 2016), increasing deterrence, and reducing convictions even at the expense of longer sentences (Bronsteen and Masur 2015). Kaplow (2012) criticizes conventional burden of proof standards on social welfare grounds, developing an alternative framework which considers the effect of the standard of proof on deterring harmful acts and its chilling effect on benign acts. The legal literature has been exclusively normative, and no attempt has been made to investigate what people's preferences for

criminal justice error types actually are.⁴ More importantly, no attempt has been made to investigate theoretically or empirically what shapes individuals' preferences for criminal justice error types.

The paper proceeds as follows. Section 2 develops an instrumental theory and an intrinsic theory of preferences for criminal justice error types. Section 3 uses U.S. data on preferences for criminal justice error types to find support for the two theories. Section 4 uses data from 22 countries on preferences for criminal justice error types to confirm the findings from Section 3. Section 5 extends the analysis in the paper. First, I show that there is a strong correlation at the group level between preferences in countries of family origin and preferences in the U.S., consistent with the idea that culture is a factor in shaping preferences. Second, I show that unlike blacks in the U.S., Israeli Arabs, who exhibit some similar patterns to blacks in the U.S. in terms of crime, care less about convicting the innocent than Jews. The size of the difference suggests that the instrumental theory of preferences is not the only one factor here, and the intrinsic theory of preferences may also explain this difference in preferences. Third, I extend the model from Section 2 to incorporate the effect of preferences on deterrence as well as incapacitation. Section 6 concludes.

2 Theory

2.1 Instrumental Preferences

How do criminal justice error types affect individuals' utility? One possibility to consider is that individuals derive utility from consumption. However, their consumption is affected by criminal justice error types (compare Alesina and Giuliano 2011, pp. 99-100). Formally, consider the following utility function:

$$U_i = c_i(\dots, e) \tag{1}$$

where individual i derives utility from consumption through the function c_i , which depends on several standard variables, such as labor supply or productivity, but also on the error ratio $e = \varepsilon_1/\varepsilon_2$, which is the probability of convicting the innocent (ε_1) divided by the probability of letting the guilty

⁴One exception is Givati (2014), which highlights the variation across countries in preference for criminal justice error types.

Preferences for Criminal Justice Error Types

go free (ε_2). An important assumption is that there is a technological tradeoff between these two error types. This means that we can only reduce one by increasing the other. This idea is reflected in Posner (1999), who notes that "Trading off Type I and Type II errors is a pervasive feature of evidence law."

The utility function in Expression 1 captures the idea that individual i does not care about criminal justice error types in and of themselves. Rather, he only cares about how these preferences affect his consumption. But how is consumption affected by criminal justice error types? Or formally, what would be the sign of the first derivative of the utility function, that is the sign of $\partial c_i / \partial e$? Two considerations are important in this respect:

1. The risk of crime. When e is very low the probability of convicting the innocent (ε_1) is low, while the probability of letting the guilty go free (ε_2) is high. In other words, the legal system lets many guilty people go free, to avoid convicting an innocent person. This may lead to higher crime, because of the reduced incapacitating power of the legal system. Put simply, fewer people behind bars means more people on the streets able to commit crimes.⁵ Higher crime reduces the individual's consumption either directly (in case of theft or robbery), or indirectly (by spending more on protection from crime, insurance, or because of medical expenses following a violent crime).
2. The risk of conviction. When e is very high, the probability of convicting the innocent (ε_1) is high, while the probability of letting the guilty go free (ε_2) is low. In other words, the legal system convicts many innocent people, to avoid letting guilty people go free. This means that the individual is more likely to be justly convicted if he committed a crime, or falsely convicted if he did not commit a crime. Being captured and convicted reduces the individual's consumption.

We can capture these two effects formally. Suppose that the expected cost of crime to individual i is $\gamma_i c(e)$, where $c'(e) < 0 < c''(e)$ (and "c" stands for

⁵Note that I am explicitly ignoring deterrence in this analysis, and focusing only on incapacitation. This is because, generally, the effect of a change in e on deterrence is theoretically ambiguous. I develop this point formally in Section 5.3, where I also consider cases where it is possible to make a clear prediction on the effect of e on deterrence in a manner that is consistent with the analysis in this Section.

Preferences for Criminal Justice Error Types

crime). This means that, as the error ratio e increases, the likelihood of suffering from crime decreases, because more people are incapacitated, and the marginal effect of the error ratio on the risk of crime is decreasing in absolute value. The parameter γ_i reflects individual-specific circumstances that determine the individual's exposure to the risk of crime. Suppose also that the expected cost of a conviction to individual i is $\delta_i d(e)$, where $d'(e), d''(e) > 0$ (and "d" stands for decision). This means that, as the error ratio e increases, the likelihood of being convicted increases, and the marginal effect of the error ratio on the risk of a conviction is increasing. The parameter δ_i reflects individual-specific circumstances that determine the individual's exposure to the risk of conviction. Lastly, suppose that individual i 's income is y_i .

Under these assumptions, when choosing his preferences for criminal justice error types, the individual solves the following problem:

$$\max_e y_i - \gamma_i c(e) - \delta_i d(e) \tag{2}$$

This maximization problem yields the following first order condition:

$$-\frac{d'(e)}{c'(e)} = \frac{\gamma_i}{\delta_i} \tag{3}$$

Looking at Expression 3, one can see that the preferences for criminal justice error types depend on the individual's exposure to the risk of crime (γ_i), and the individual's exposure to the risk of conviction (δ_i). Using Expression 3 we can derive the following relationship:⁶

$$\frac{\partial e}{\partial \gamma_i / \delta_i} > 0 \tag{4}$$

This relationship can be summarized in the following proposition:

Proposition 1 *An increase in the exposure to the risk of crime relative to the risk of conviction, that is an increase in γ/δ , leads individuals to prefer a higher error ratio e , that is a lower probability of letting the guilty go free, at the expense of a higher probability of convicting the innocent.*

⁶Using the implicit function theorem on Expression 3, we get:

$$\frac{\partial e}{\partial \gamma_i / \delta_i} = \frac{-c'(e)}{d''(e) - c''(e)(d'(e)/c'(e))} > 0$$

The intuition behind Proposition 1 can be explained. A higher error ratio leads to less crime but a higher chance of conviction. This change is desirable for people with a high exposure to the risk of crime and a low exposure to the risk of conviction.

2.2 Intrinsic Preferences

Individuals may have preferences for criminal justice error types that are independent of the effect of these error types on their consumption (compare Alesina and Giuliano 2011, pp. 100-101). That is, individuals may have views regarding the "proper" likelihood of convicting the innocent versus letting the guilty go free. Formally, recall the error ratio $e = \varepsilon_1/\varepsilon_2$, which is the probability of convicting the innocent (ε_1) divided by the probability of letting the guilty go free (ε_2). As before, we assume that there is a technological tradeoff between these two error types, which means that we can only reduce one by increasing the other. Consider the following utility function:

$$U_i = c_i(\dots, e) - \beta_i(e - e_i^*)^2 \tag{5}$$

where e_i^* is the ideal error ratio for individual i , and β_i is the weight given by individual i to deviations from this ideal ratio.

This function reflects the idea that individual i derives a direct utility from the error ratio being his ideal ratio. Any deviation from this ratio is costly to the individual. Much of the empirical analysis will focus on what determines e_i^* for different individuals, that is what shapes people's views about the proper relationship between the criminal justice error types.

The first term in the utility function in Expression 5 is the same as in Expression 1. This reflects the idea that there could be a tradeoff between the indirect and the direct effect of criminal justice errors on individuals' utility. For example, an individual may have a very low e_i^* , that is he may want the probability of convicting the innocent to be very low, even if this means the probability of letting the guilty go free is high. However, adopting the position $e = e_i^*$ may mean that many guilty people will go free, which will expose the individual to high risk of crime. The individual will thus trade off the intrinsic desire for a low e with the instrumental cost of a low e .

3 Evidence from the U.S.

3.1 Data

Every year since 1972 the General Social Survey (GSS) has interviewed an independent cross-section sample of individuals living in the US, ages 18 and up. The survey asks questions about a wide range of opinions, as well as standard demographics.

The variable of interest for preferences for criminal justice error types is based on the following question from the General Social Survey: "All systems of justice make mistakes, but which do you think is worse: To convict an innocent person or to let a guilty person go free?" In the empirical analysis I use a dummy variable that assumes the value one when the respondent answered that convicting an innocent person is worse, and zero when the respondent answered that letting a guilty person go free is worse.

In connecting the above question to the model, recall that the error ratio is $e = \varepsilon_1/\varepsilon_2$, which is the probability of convicting the innocent (ε_1) divided by the probability of letting the guilty go free (ε_2). Thus, when an individual says that convicting an innocent person is worse than letting a guilty person go free, that means that the individual prefers a relatively low e . When an individual says that letting a guilty person go free is worse than convicting an innocent person, it means that the individual prefers a relatively high e .

The above question was asked in the General Social Survey five times, in the years 1985, 1990, 1996, 2006 and 2016. Figure 2 presents the share of respondents who think that convicting an innocent person is worse than letting a guilty person go free, over time, with 95% confidence intervals.

Averaging the data over the years, around 74% of Americans think that convicting an innocent person is worse than letting a guilty person go free, while around 26% hold the opposite view. Over time there has been a decrease in the share of Americans who think that convicting an innocent person is worse, from 76% in 1985 to 69% in 2006, but this trend was reversed in 2016, when 78% of Americans thought that convicting an innocent person is worse. To account for the variation in preferences over time I include year fixed effects in the individual level analysis.

Table 1 presents descriptive statistics for the GSS variables that are used in the analysis. The demographic variables are self explanatory, though note that the age variable I use is the true age divided by 10, for the purpose of obtaining coefficients that are easier to read.

Preferences for Criminal Justice Error Types

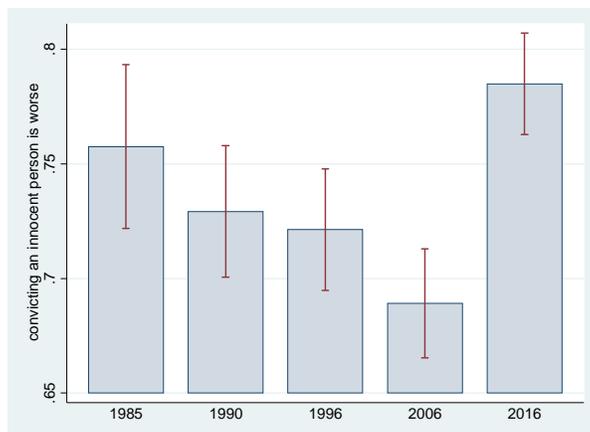


Figure 2: Share of U.S. respondents who think that convicting an innocent person is worse than letting a guilty person go free

To indicate education I use two dummy variables which indicate whether the highest degree the respondent has is from a highschool (including junior college) or from a university (either college or graduate school). The variable capturing respondents' ideology is "liberal," which indicates how respondents classified their ideological views, where 1 stands for extremely conservative, 7 stands for extremely liberal, and 4 is for moderate. The variable "income" indicates the respondent's inflation-adjusted family income in 2000 dollars. The dummy variable "immigrant" assumes the value one for individuals who were not born in the U.S. This variable has smaller coverage than other variables.

To capture respondents' concern about crime I use two variables. The first one, "spend more on police", represents respondents' answer to the question of whether they would like to see more or less government spending on police and law enforcement, where 1 stands for "spend much less", 5 stands for "spend much more", and 3 stands for "spend the same as now." The second variable is "courts not harsh enough," which reflects respondents' answer to the question "in general, do you think the courts in this area deal too harshly or not harshly enough with criminals?" where 1 stands for "too harshly", 3 stands for "not harshly enough", and 2 stands for "about right." This variable has smaller coverage, but it asks more directly about the treatment of criminals in the respondent's area.

Lastly, I attempt to measure the likelihood of respondents breaking the

Preferences for Criminal Justice Error Types

Table 1: Descriptive Statistics for GSS Data

	Obs.	Mean	St. Dev.	Min	Max
convict innocent worse	5,374	0.739	0.439	0	1
female	5,374	0.536	0.499	0	1
black	5,374	0.134	0.34	0	1
age	5,361	4.653	1.72	1.8	8.9
married	5,374	0.493	0.5	0	1
highschool	5,374	0.581	0.493	0	1
university	5,374	0.252	0.434	0	1
liberal	5,161	3.883	1.399	1	7
income	4,827	47,651	38,420	363	178,266
immigrant	3,900	0.084	0.276	0	1
spend more on police	5,264	3.575	0.838	1	5
courts not harsh enough	3,640	2.684	0.637	1	3
always obey law	5,194	0.447	0.491	0	1

law using the dummy variable "always obey law." This variable reflect respondents' answer to the question "would you say that people should obey the law without exception, or are there exceptional occasions on which people should follow their consciences even if it means breaking the law?" This variable assumes the value one if the respondent thought that people should always obey the law.

3.2 Individual Characteristics

I begin by analyzing the relationship between individual characteristics and preferences for criminal justice error types, using the GSS data. In Table 2 I use a linear probability model, presenting the results of OLS regressions where the dependent variable is a dummy variable, which assumes the value one if the respondent thought that convicting an innocent person is worse than letting a guilty person go free. All the regressions control for year fixed effects, and weigh observations by the weights provided by the GSS.

Looking at column (1), one can see that women care less about convicting the innocent than men. Specifically, women are 4.4% less likely to think that convicting an innocent person is worse than letting a guilty person go free. This finding is interesting, since we generally think that, in the U.S. as well as in other western countries, women are more liberal than men (Inglehart and Norris 2000, Edlund and Pande 2002), and as will be shown later, liberals

Preferences for Criminal Justice Error Types

Table 2: Preferences for Criminal Justice Error Types

Dep. Variable:	convict the innocent is worse				
	(1)	(2)	(3)	(4)	(5)
female	-0.0437*** (0.0136)	-0.0388*** (0.0134)	-0.0407*** (0.0136)	-0.0429*** (0.0143)	-0.0369** (0.0160)
black	0.0517*** (0.0189)	0.0641*** (0.0189)	0.0593*** (0.0194)	0.0642*** (0.0206)	0.0606*** (0.0234)
age	0.0847*** (0.0231)	0.0579** (0.0230)	0.0552** (0.0234)	0.0625** (0.0255)	0.0812*** (0.0286)
age squared	-0.00760*** (0.00226)	-0.00480** (0.00226)	-0.00441* (0.00228)	-0.00517** (0.00252)	-0.00719** (0.00283)
married	-0.0434*** (0.0141)	-0.0547*** (0.0140)	-0.0496*** (0.0143)	-0.0600*** (0.0160)	-0.0640*** (0.0179)
highschool		0.0405** (0.0202)	0.0408* (0.0211)	0.0249 (0.0230)	0.0264 (0.0261)
university		0.182*** (0.0210)	0.175*** (0.0219)	0.155*** (0.0252)	0.154*** (0.0284)
liberal			0.0173*** (0.00488)	0.0172*** (0.00510)	0.0218*** (0.00573)
ln income				0.0220** (0.00883)	0.0202** (0.0102)
immigrant					-0.0576* (0.0301)
Obs.	5,361	5,361	5,151	4,668	3,449
R^2	0.015	0.036	0.038	0.043	0.046

*** p<0.01, ** p<0.05, * p<0.1. Robust standard errors.

All regressions control for year fixed effects.

care more about convicting the innocent.

A possible explanation for this finding is that women’s criminal justice error preferences reflect the instrumental theory of preferences. Relative to men, women are exposed to a higher risk of crime than a risk of conviction. To illustrate, for the years 1980-2008, women were twice as likely to be victims of a homicide than to commit a homicide (Cooper and Smith 2011, p. 3).⁷ Accordingly, women represented only 7% of the total prison population in the years 2004-2014 (Carson 2015). Formally, this means that the ratio γ/δ is higher for women than for men, and therefore according to Proposition 1 women should care less about convicting the innocent. Intuitively, if a lower concern about convicting the innocent leads to less crime but a higher chance of conviction, then women benefit from the former effect but are not hurt

⁷10.5% of homicide offenders were women, while 23.2% of homicide victims were women.

Preferences for Criminal Justice Error Types

by the latter effect. This may explain why women care less than men about convicting the innocent.

Based on column (1), blacks care more about convicting the innocent than non-blacks. Specifically, blacks are 5.2% more likely to think that convicting an innocent person is worse than letting a guilty person go free. Note that this relationship holds even when controlling for political ideology in column (3).

Is it possible to interpret this finding as reflecting instrumental preferences for criminal justice error types? Relative to non-blacks, blacks are exposed to a high risk of crime, but also to a high risk of conviction. To illustrate, for the years 1980–2008, blacks constituted 47.4% of homicide victims and 52.5% of homicide offenders, while their share of the population was 12.6% (Cooper and Smith 2011, p. 3). Formally, this means that both the exposure to the risk of crime (γ) and to the risk of conviction (δ), are higher for blacks. However, it is unclear whether the ratio γ/δ is higher for blacks, and therefore one cannot conclude based on Proposition 1 whether blacks should care less or more about convicting the innocent.

Intuitively, if a lower concern about convicting the innocent leads to less crime but a higher chance of conviction (whether just or false), then blacks benefit from the former effect but are hurt by the latter effect. Therefore, theoretically it is unclear whether blacks should care more or less than non-blacks about convicting the innocent. That blacks care more about convicting the innocent may indicate that what is driving their views is their concern about being convicted rather than about crime.

The relationship between age and preferences for criminal justice error types, based on Table 2, appears to look like an inverted U curve. Relatively young and relatively old individuals seem to care less about convicting the innocent than middle-aged individuals (peak concern for the innocent is around ages 55-60).

That older individuals care less about convicting the innocent seems consistent with the instrumental theory of preferences. Relative to other parts of the population, they are exposed to a higher risk of crime than a risk of conviction. To illustrate, for the years 1980–2008, people who were 65 or older were more than three times as likely to be victims of a homicide than to commit a homicide (Cooper and Smith 2011, p. 3).⁸ Formally, this means

⁸1.6% of homicide offenders were 65 or older, while 5.1% of homicide victims were 65 or older.

Preferences for Criminal Justice Error Types

that the ratio γ/δ is high for older individuals, and therefore according to Proposition 1 they should care less about convicting the innocent. Intuitively, if a lower concern about convicting the innocent leads to less crime but a higher chance of conviction, then older people benefit from the former effect but are not hurt by the latter effect. However, why younger individuals care less about convicting the innocent seems harder to explain using the instrumental theory of preferences.

Lastly, column (1) indicates that married respondents care less about convicting the innocent than non-married respondents. Specifically, relative to non-married people, married people were 4.3% less likely to think that convicting an innocent person is worse than letting a guilty person go free. This may also reflect instrumental preferences, as people who are married are significantly less involved in crime than people who are not-married, and therefore they are exposed to low risk of conviction. To illustrate, inmates in their twenties are less than half as likely to be married as their non-incarcerated counterparts (Western 2006, p. 136-137). Formally, this means that the ratio γ/δ is high for married individuals, and therefore according to Proposition 1 they should care less about convicting the innocent.

3.3 Education, Ideology, Income and Culture

In column (2) of Table 2 I look at the relationship between education and preferences for criminal justice error types. I use two dummy variables that indicate whether the respondent's highest degree is from a highschool or from a university. Education is positively correlated with concern about convicting the innocent. Respondents whose highest degree is from a highschool are 4% more likely to think that convicting an innocent person is worse than letting a guilty person go free, and those whose highest degree is from a university are 18.2% more likely to think that convicting an innocent person is worse than letting a guilty person go free.

The relationship between education and preferences for criminal justice error types is hard to explain using the instrumental theory of preferences. There seems to be no instrumental reason why more educated people, who are generally less involved in crime, and therefore less exposed to the risk of conviction, would care more about convicting the innocent. For the instrumental theory to explain this finding the ratio γ/δ has to be lower for more educated individuals, which means that relative to less educated individuals, they are more exposed to the risk of conviction than to the risk of crime.

Preferences for Criminal Justice Error Types

This does not seem very plausible.

It seems more plausible that this relationship reflects the intrinsic theory of preferences. In other words, educated people may care more about convicting the innocent because they have been educated to believe so. As noted by Ellis (1970, p. 845) "schoolboys are taught that it is better to let ten men go free than to convict an innocent man." Along the same lines, Johnson (2016, p. 238) notes: "Enroll in law school and you will be taught, within the first year, a revered maxim of criminal law: 'Better that ten guilty persons escape, than that one innocent suffer.'" And Ricciardelli et al. (2009) find that studying criminal justice makes students more likely to agree with this latter maxim. Educated people therefore have a different view about the "proper" way to trade off criminal justice error types.

In column (3) of Table 2 I look at how ideology correlates with preferences for criminal justice error types. The measure of ideology I use, "liberal," indicates to what extent respondents viewed themselves as liberal (1 stands for extremely conservative, 7 stands for extremely liberal, and 4 is for moderate). I find that liberalism is positively correlated with a greater concern about convicting the innocent. An increase of one standard deviation in the measure of liberalism increases the likelihood of respondents thinking that convicting an innocent person is worse than letting a guilty person go free by 2.5%. The relationship between ideology and preferences seems to reflect the intrinsic theory of preferences. Controlling for other variables, people who self-identify as more liberal simply seem to have a different ideological preference for criminal justice error types.

In column (4) of Table 2 I look at how income correlates with preferences for criminal justice error types. I find that income is positively correlated with preferences for criminal justice error types. Specifically, a one standard deviation increase in log income is correlated with a 2.2% increase in the likelihood of respondents thinking that convicting an innocent person is worse than letting a guilty person go free.

The association between income and preferences for criminal justice error types is hard to explain using the instrumental theory of preferences. For the instrumental theory to explain this finding the ratio γ/δ has to be lower for more people with high income, which means that relative to people with low income, they are more exposed to the risk of conviction than to the risk of crime. It seems more plausible that this relationship reflects the intrinsic theory of preferences. In other words, wealthy people simply care more about convicting the innocent. That relatively affluent Americans tend to be more

Preferences for Criminal Justice Error Types

liberal than others on moral issues has been highlighted in other studies (Gilens 2009, 2012).

In column (5) of Table 2 I look at whether immigrants have different preferences for criminal justice error types than non-immigrants, using a dummy variable that indicates whether the individual was born outside the U.S. I find that immigrants care less about convicting the innocent than non-immigrants. Specifically, immigrants are 5.6% less likely to think that convicting an innocent person is worse than letting a guilty person go free.

The difference in preferences between immigrants and non-immigrants could be the result of the different preferences in immigrants' country of origin, and the persistence of these preferences following immigration. In other words, the difference in preferences between immigrants and non-immigrants could be result of a difference in culture, defined as "those customary beliefs and values that ethnic, religious, and social groups transmit fairly unchanged from generation to generation" (Guiso et al. 2006). If so then this difference is another reflection of the intrinsic theory of preferences. Further evidence of the relationship between culture and preferences are presented in Section 5.

3.4 Concern about Crime and Obeying Law

According to the instrumental theory of preferences, individuals determine their preferences by trading-off the risk of crime with the risk of conviction. A lower likelihood of convicting the innocent reduces the individual's risk of conviction, but increases the individual's risk of crime. If this theory of preferences is true, then individuals who are more exposed to the risk of crime should be less likely to think that convicting the innocent is worse than letting the guilty go free. Formally, according to Proposition 1, if γ increases e should increase.

In Table 3 I look at the relationship between concern about crime and preferences for criminal justice error types. I use two different variables to measure concern about crime. "Spend more on police" reflects respondents views on whether they would like to see more government spending on police and law enforcement. "Courts not harsh enough" reflects respondents views on whether courts in their area do not deal harshly enough with criminals. In both cases I control for all the variables in column (4) of Table 2.⁹

⁹I do not include immigrant status since doing so significantly reduces the number

Preferences for Criminal Justice Error Types

Table 3: Preferences, Concern about Crime, and Obeying Law

Dep. Variable:	convict the innocent is worse		
	(1)	(2)	(4)
spend more on police	-0.0281*** (0.00844)		-0.0228*** (0.00862)
courts not harsh enough		-0.0833*** (0.0115)	
always obey law			-0.0811*** (0.0155)
female	-0.0413*** (0.0144)	-0.0320* (0.0165)	-0.0359** (0.0145)
black	0.0727*** (0.0205)	0.0481** (0.0243)	0.0777*** (0.0208)
age	0.0593** (0.0258)	0.0849*** (0.0293)	0.0593** (0.0263)
age squared	-0.00484* (0.00254)	-0.00738** (0.00291)	-0.00463* (0.00259)
married	-0.0558*** (0.0161)	-0.0520*** (0.0185)	-0.0532*** (0.0163)
highschool	0.0259 (0.0232)	0.0350 (0.0265)	0.0147 (0.0239)
university	0.152*** (0.0254)	0.154*** (0.0291)	0.134*** (0.0261)
liberal	0.0163*** (0.00517)	0.0146** (0.00607)	0.0140*** (0.00525)
ln income	0.0231*** (0.00884)	0.0207** (0.0103)	0.0204** (0.00891)
Obs.	4,582	3,238	4,456
R^2	0.045	0.057	0.053

*** p<0.01, ** p<0.05, * p<0.1. Robust standard errors.
All regressions control for year fixed effects.

Columns (1) and (2) of Table 3 reveal a negative relationship between concern about crime and concern about convicting the innocent. The magnitude of this relationship can be assessed. According to column (1), a one standard deviation increase in respondents' views about the desirability of spending more on police and law enforcement reduces the likelihood of thinking that convicting the innocent is worse by 2.4%. According to column (2), a one standard deviation increase in respondents' views about the non-harshness of courts reduces the likelihood of thinking that convicting the innocent is worse by 5.2%.

These results seem consistent with the instrumental theory of preferences.

of observations. The results do not change when immigrant status is included in the regressions.

Preferences for Criminal Justice Error Types

A greater concern about crime is correlated with less concern about convicting the innocent. These results are particularly interesting because they hold when all the controls of Table 2 are included. This means that, for example, when comparing people of equal education and ideology, as well as other individual characteristics, concern about crime is correlated with preferences.

In column (3) of Table 3 I look at how respondents' commitment to obeying the law correlates with preferences for criminal justice error types. I find that respondents who think that one should always obey the law are 8.2% less likely to think that convicting an innocent person is worse than letting a guilty person go free. This finding seems to be consistent with the instrumental theory of preferences. People who are committed to always obeying the law are less exposed to the risk of conviction. Formally, this means that these people have a low δ , and according to Proposition 1, if δ decreases e should increase. Intuitively, if a lower concern about convicting the innocent leads to less crime but a higher chance of conviction, then people who never break the law benefit from the former effect but are not significantly hurt by the latter effect.

4 Evidence from Across Countries

4.1 Data

The International Social Survey Program (ISSP) is a cross-national collaboration program, conducting annual surveys on diverse topics relevant to social sciences. The ISSP researchers develop questions that can be expressed in an equal manner in different languages.

For the analysis I use the ISSP cumulative file for the "Role of Government" modules, which were conducted in the years 1985, 1990, 1996 and 2006. This dataset includes answers from surveys that were conducted in 22 Countries.¹⁰ These are all ISSP member countries that participated in at least two "Role of Government" modules. The "Role of Government" modules ask respondents about their preferences for criminal justice error types, using the following question: "All systems of justice make mistakes, but which do you think is worse: To convict an innocent person or to let a

¹⁰Australia, Canada, Switzerland, Czech Republic, Germany, Spain, France, Great Britain, Hungary, Ireland, Israel, Italy, Japan, Latvia, Norway, New Zealand, Philippines, Poland, Russia, Sweden, Slovenia, United States.

Preferences for Criminal Justice Error Types

Table 4: Descriptive Statistics for ISSP Data

	Obs.	Mean	St. Dev.	Min	Max
convict innocent worse	68,934	0.761	0.427	0	1
female	68,811	0.513	0.500	0	1
age	68,456	4.592	1.701	1.5	9.7
married	66,171	0.624	0.484	0	1
high school	68,934	0.373	0.483	0	1
university	68,934	0.142	0.349	0	1
left	39,274	3.072	0.969	1	5
spend more on law enforcement	64,767	3.602	0.885	1	5
always obey law	63,944	0.405	0.491	0	1

guilty person go free?" As above, I use a dummy variable that assumes the value one when the respondent said that convicting an innocent person is worse, and zero when the respondent said that letting a guilty person go free is worse.

Table 4 presents descriptive statistics of the ISSP variables that are used in the analysis. I generally use the same variables that were used in the analysis of the GSS data, though some variable, such as race, are unavailable in the ISSP data. The demographic variables are self explanatory, though note that the age variable I use is the true age divided by 10, for the purpose of obtaining coefficients that are easier to read.

The variables I use to indicate education are dummy variables that indicate whether the highest degree the respondent has is from high school (including from an institution above a high school but less than a university), or from a university. The variable capturing respondents' ideology is "left" which is respondents' derived party affiliation, where the values indicate far right (1), right (2), center (3), left (4), and far left (5). Note that this variable has significantly less coverage than other variables.

To capture respondents' concern about crime I use the variable "spend more on law enforcement", which reflects respondents' answer to the question whether they would like to see more or less government spending on law enforcement, where 1 stands for "spend much less", 5 stands for "spend much more", and 3 stands for "spend the same as now." Lastly, to measure the likelihood of respondents breaking the law I use the dummy variable "always obey law." This variable assumes the value one if the respondent thought that one should obey the law without exception.

Preferences for Criminal Justice Error Types

Table 5: Preferences for Criminal Justice Error Types around the World

Dep. Variable:	convict the innocent is worse			
	(1)	(2)	(3)	(4)
female	-0.0129*** (0.00349)	-0.0111*** (0.00347)	-0.0135*** (0.00370)	-0.0184*** (0.00467)
age	0.0461*** (0.00627)	0.0394*** (0.00627)	0.0418*** (0.00674)	0.0343*** (0.00856)
age squared	-0.00429*** (0.000632)	-0.00319*** (0.000633)	-0.00317*** (0.000680)	-0.00224*** (0.000846)
married	-0.0161*** (0.00395)	-0.0167*** (0.00394)	-0.0165*** (0.00420)	-0.0182*** (0.00529)
highschool		0.0439*** (0.00424)	0.0411*** (0.00450)	0.0396*** (0.00576)
university		0.117*** (0.00504)	0.111*** (0.00538)	0.114*** (0.00669)
spend more on law enforcement			-0.0250*** (0.00230)	-0.0297*** (0.00300)
always obey law			-0.0366*** (0.00406)	-0.0445*** (0.00520)
left				0.0154*** (0.00249)
Obs.	65,728	65,728	57,400	35,184
R^2	0.032	0.040	0.046	0.042

*** p<0.01, ** p<0.05, * p<0.1. Robust standard errors.

All regressions control for country×year fixed effects.

4.2 Evidence

Table 5 presents the results of OLS regressions, where the dependent variable is a dummy variable, assuming the value one if the respondent thought that convicting an innocent person is worse than letting a guilty person go free. All the regressions control for country×year fixed effects, and weigh observations by the weights provided by the ISSP.

Comparing Table 5 with Table 2 one can see that, generally speaking, the same relationships that were found in the U.S. using the GSS data can also be seen across countries in the ISSP data. Specifically, in column (1) of Table 5 one can see that women care less than men about convicting the innocent. Specifically, women are 1.3% less likely to think that convicting an innocent person is worse than letting a guilty person go free. Though statistically significant, the difference between men’s and women’s criminal justice error preferences is larger in the U.S. than across countries.

Just like in Table 2, the relationship between age and preferences for

Preferences for Criminal Justice Error Types

criminal justice error types in Table 5 appears to look like an inverted U curve. Relatively young and relatively old individuals seem to care less about convicting the innocent than middle-aged individuals (peak concern for the innocent is around ages 54-64).

In column (2) of Table 5 one can see that education is positively correlated with concern about convicting the innocent. Respondents whose highest degree is a high school degree are 4.4% more likely to think that convicting an innocent person is worse than letting a guilty person go free. Respondents with a university degree are 12% more likely to think that convicting an innocent person is worse than letting a guilty person go free. These findings are consistent with the findings for the U.S. in Table 2, though the university coefficient is larger in the U.S. than across countries.

In column (3) one can see that there is a negative relationship between concern about crime and concern about convicting the innocent. A one standard deviation increase in respondents' views about the desirability of more spending on law enforcement reduces the likelihood of thinking that convicting an innocent person is worse by 2.2%. This is consistent with the findings for the U.S. in Table 3. Also, there is a negative relationship between commitment to always obeying the law and concern about convicting the innocent. Respondents who think that one should always obey the law are 3.7% less likely to think that convicting an innocent person is worse than letting a guilty person go free. This is consistent with the findings for the U.S. in Table 3, though the correlation between commitment to obeying the law on preferences is stronger in the U.S. than across countries.

Lastly, ideology matters. In column (4) I find that affiliation with a left-wing party is positively correlated with a greater concern about convicting the innocent. A one standard deviation increase in the measure of support for the left increases the likelihood of thinking that convicting an innocent person is worse than letting a guilty person go free by 1.5%. This is consistent with the findings for the U.S. in Table 2.

5 Extensions

5.1 Culture

Section 3 showed that there is a difference in preferences for criminal justice error types between immigrants to the U.S. and non-immigrants. This find-

Preferences for Criminal Justice Error Types

ing may be the result of a difference in culture. The idea is that immigrants' preferences reflect the preferences in their country of origin. Using the correlations between immigrants' preferences and the preferences in their countries of origin as an indication of the effect of culture on preferences is a known methodology in the cultural economics literature (for example, Alesina and Giuliano 2011, Luttmer and Singhal 2011). In a similar manner, Fisman and Miguel (2007) show that UN diplomats in New York City who come from more corrupt countries are more likely to commit parking violations.

To further investigate this possibility I use data from the General Social Survey (GSS) on respondents' country of family origin. Specifically, respondents were asked the following question: "From what countries or part of the world did your ancestors come?" I use the GSS ethnic variable that captures the country of family origin the respondent feels closest to. For each country of origin I calculate the share of respondents in the GSS who think that convicting an innocent person is worse than letting a guilty person go free.

I then use data from the International Social Survey Program (ISSP) to calculate preferences for criminal justice error types in different countries. I use the share of respondents in each country who think that convicting an innocent person is worse than letting a guilty person go free, averaged over the four waves of the "Role of Government" module (1985, 1990, 1996 and 2006), to maximize the number of countries in the data.

To see whether culture is indeed a factor in shaping people's preferences for criminal justice error types, I match the two measures of preferences at the country level. Figure 3 reflects the outcome of this match. In Figure 3 each dot reflects two values for a country. The horizontal axis value is the share of respondents in a country who thought that convicting the innocent is worse than letting the guilty go free, taken from the ISSP data. The vertical axis value is the share of respondent in the U.S., whose families originated from that country, who think that convicting the innocent is worse than letting the guilty go free, taken from the GSS data.

As one can see, there is a positive correlation between preferences in country of family origin and preferences in the U.S. The greater the share of a country's population who think that convicting an innocent person is worse, the higher the share of people in the U.S., whose family originated from that country, who think that convicting the innocent is worse.¹¹ This relationship

¹¹In a bivariate regression, an increase of one percentage point in the share of the population who think that convicting an innocent person is worse in the country of family origin

Preferences for Criminal Justice Error Types

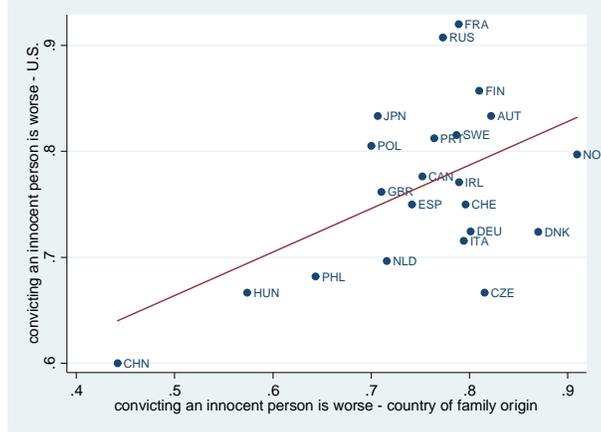


Figure 3: Preferences of Groups in Country of Family Origin and in the U.S.

seems consistent with the idea that culture, namely, "those customary beliefs and values that ethnic, religious, and social groups transmit fairly unchanged from generation to generation" (Guiso et al. 2006), is a factor in shaping preferences.

5.2 Minorities

Unlike the GSS data, the International Social Survey Program (ISSP) data used in Section 4 does not provide comparative information about race, and race of course plays a very different role outside the U.S. For that reason the analysis in Section 4 did not consider race. The question arises whether minority groups outside the U.S. that exhibit some similar patterns to blacks in the U.S. also care more about convicting the innocent. To address this question, I look for a natural minority group within one of the 22 countries covered by the ISSP data. One minority group that seems fitting to focus on is the Arab minority in Israel.

The Arab population of Israel exhibits certain similarities to the black population in the U.S. in terms of its involvement in crime. Israeli Arabs

is correlated with an increase of 0.41 percentage points in the share of U.S. respondents whose family originated in that country, who think that convicting an innocent person is worse (p-value<0.01).

Preferences for Criminal Justice Error Types

are disproportionately involved in crime, but also disproportionately suffer from crime. To illustrate, for the years 2006–2012, Arabs constituted 48.5% of homicide victims and 55.5% of homicide offenders in Israel, while their share of the population was 20% (Hasisi and Teschner 2014). These patterns are similar to blacks in the U.S., and this similarity makes comparing these groups interesting.

The ISSP data on Israel is based on three surveys. In 1990 only Jewish dominated districts were covered, but in 1996 and 2006 the surveys were extended to cover Arab dominated districts in separately identified surveys. Separate "Israel-Jews" and "Israel-Arabs" surveys allow the identification of responses of the respective populations. The ISSP weighting factor accounts for any disproportionate oversampling of the populations.

Table 6 presents the results of OLS regressions for Israel, where the dependent variable is a dummy variable, assuming the value one if the respondent thought that convicting an innocent person is worse than letting a guilty person go free. All the regressions control for year fixed effects, and weigh observations by the weights provided by the ISSP.

Comparing Table 6 with Table 2 one can see that, generally, the same relationships that were found in the U.S. using the GSS data can also be seen in Israel. Women care less than men about convicting the innocent, and the relationship between age and preferences for criminal justice error types looks like an inverted U curve. Furthermore, education is positively correlated with concern about convicting the innocent, and there is a negative relationship between concern about crime and concern about convicting the innocent.¹² One difference between the U.S. and Israel is that in the U.S. commitment to always obeying the law is negatively correlated with concern about convicting the innocent, while in Israel it is positively correlated.

Based on Table 6 one can see that, unlike blacks in the U.S., Israeli Arabs care less about convicting the innocent than Jews. Specifically, while blacks in the U.S. were 6% more likely to think that convicting an innocent person is worse than letting a guilty person free, Israeli Arabs are 25% less likely to think that convicting an innocent person is worse than letting a guilty person go free.

According to the instrumental theory of preferences, if a lower concern about convicting the innocent leads to less crime but a higher chance of conviction,

¹²The variable "left" which indicates party affiliation, does not exist for Israel, and is therefore not included in the analysis.

Preferences for Criminal Justice Error Types

Table 6: Preferences for Criminal Justice Error Types in Israel

Dep. Variable:	convict the innocent is worse			
	(1)	(2)	(3)	(4)
female	-0.0515*** (0.0153)	-0.0515*** (0.0152)	-0.0545*** (0.0153)	-0.0502*** (0.0159)
arab	-0.255*** (0.0225)	-0.244*** (0.0227)	-0.249*** (0.0227)	-0.232*** (0.0242)
age	0.0952*** (0.0289)	0.0955*** (0.0290)	0.107*** (0.0292)	0.102*** (0.0302)
age squared	-0.0106*** (0.00299)	-0.0101*** (0.00300)	-0.0113*** (0.00303)	-0.0108*** (0.00313)
married	0.0129 (0.0186)	0.00992 (0.0187)	0.00711 (0.0187)	0.00662 (0.0194)
high school		0.0678*** (0.0189)	0.0680*** (0.0190)	0.0733*** (0.0199)
university		0.105*** (0.0213)	0.104*** (0.0214)	0.113*** (0.0224)
spend more on law enforcement always obey law			-0.0242*** (0.00835)	-0.0282*** (0.00878) 0.0491*** (0.0167)
Obs.	3,153	3,153	3,103	2,832
R^2	0.050	0.058	0.061	0.057

*** p<0.01, ** p<0.05, * p<0.1. Robust standard errors.

All regressions control for year fixed effects.

then Israeli Arabs benefit from the former effect but are hurt by the latter effect. Therefore, as in the case of blacks in the U.S., theoretically it is unclear whether Israeli Arabs should care more or less about convicting the innocent. That Israeli Arabs are significantly less concerned about convicting the innocent may indicate that what is driving their views is their concern about crime rather than the concern about being convicted.

Still, the difference between the preferences of Israeli Arabs and Jews is quite large, much larger than between blacks and non-blacks in the U.S., and larger than any difference we have seen in the data. This may suggest that the instrumental theory of preferences is not the only one playing a role here, and the intrinsic theory of preferences may also explain the difference in preferences. Specifically, and consistent with the previous subsection, culture, defined as "those customary beliefs and values that ethnic, religious, and social groups transmit fairly unchanged from generation to generation" (Guiso et al. 2006), may also be a factor in shaping preferences in this case.

5.3 Deterrence

The instrumental theory of preferences, developed in Section 2, considered only the incapacitating effect of law enforcement. This is because the effect of criminal justice error types on deterrence is ambiguous. This point can be illustrated.

Suppose an individual gains g from committing a crime, and that the sanction for the crime is s . The probability of the individual being falsely convicted is ε_1 and the probability of the individual being falsely acquitted is ε_2 . The individual will commit the crime if the net gain from doing so is greater than the net gain from not doing so. Formally, a crime will be committed if:

$$g - (1 - \varepsilon_2)s > -\varepsilon_1s \tag{6}$$

The net gain from committing a crime is the gain from the crime (g) minus the expected sanction, given the likelihood of a false acquittal ($(1 - \varepsilon_2)s$). The net gain from not committing a crime is the cost of the expected sanction, given the likelihood of a false conviction (ε_1s).

Let us define the difference between the net gain from committing a crime and from not committing a crime as G . Formally,

$$G = g - s + (\varepsilon_1 + \varepsilon_2)s$$

Individuals commit a crime when $G > 0$. A change that leads to a reduction in G increases deterrence, whereas a change that leads to an increase in G reduces deterrence.

In this setting, it is unclear whether an increase in the error ratio $e = \varepsilon_1/\varepsilon_2$ will lead to an increase or a decrease in G . Recall the assumption that there is a technological tradeoff between these two error types. This means that we can only reduce one by increasing the other. But when the likelihood of a false conviction (ε_1) increases, while the likelihood of a false acquittal (ε_2) decreases, the effect of these changes on G is unclear, and depends on the magnitude of each of these changes.

The analysis so far assumed that by committing a crime the individual eliminates the risk of a false conviction. In many cases, however, by committing a crime the individual will not eliminate the risk of a false conviction (Lando 2006). In particular, in the case of a mistake about identity, a person who commits a criminal act does not thereby eliminate the risk of being convicted of someone else's crime. In such cases the individual will commit

the crime if:

$$g - (1 - \varepsilon_2)s - \varepsilon_1s > -\varepsilon_1s \tag{7}$$

The only difference between Expressions 7 and 6 is that in Expression 7 the net gain from committing a crime takes into account not only the expected sanction given the likelihood of a false acquittal $((1 - \varepsilon_2)s)$, but also the expected sanction in light of the risk of a false conviction (ε_1s) .

We can now define \tilde{G} , the difference between the net gain from committing a crime and from not committing a crime in this new setting, as the following:

$$\tilde{G} = g - s + \varepsilon_2s$$

In this setting, an increase in the error ratio $e = \varepsilon_1/\varepsilon_2$, in which the likelihood of a false conviction (ε_1) increases, while the likelihood of a false acquittal (ε_2) decreases, leads to a reduction in \tilde{G} , and therefore an increase in deterrence. This is consistent with the analysis in Section 2, where it was assumed that $c'(e) < 0$, that is the risk of crime decreases with e .

6 Conclusion

The preferences for criminal justice error types are core legal preferences. These preferences shape the legal system in many ways, and have attracted much attention from legal scholars. The work of these scholars, however, has been exclusively normative, and no attempt has been made to investigate theoretically or empirically what shapes individuals' preferences for criminal justice error types.

In this paper I develop an instrumental theory and an intrinsic theory of the preferences for criminal justice error types. Using individual level data from the U.S., I find support for both theories. I then confirm these findings using individual level data from 22 countries.

The literature on preferences for redistribution began by developing competing theories and using survey data to find patterns that were consistent with these theories. Subsequent research focused on identifying natural experiments to establish robust causal mechanisms. Here too, the data analyzed in the paper only reveals patterns that are consistent with the two theories developed in the paper. Subsequent research should focus on identifying natural experiments that allow for stronger conclusion about the causal mechanisms shaping the preferences from criminal justice error types.

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