An experimental study of prosocial motivation among criminals

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Abstract The fact that criminal behavior typically has negative consequences for others provides a compelling reason to think that criminals lack prosocial motivation. This paper reports the results from two dictator game experiments designed to study the prosocial motivation of criminals. In a lab experiment involving prisoners, we find a striking similarity in the prosocial behavior of criminals and non-criminals, both when they interact with criminals and when they interact with non-criminals. Similarly, in an Internet experiment on a large sample from the general population, we find no difference in the prosocial behavior of individuals with and without a criminal record. We argue that our findings provide evidence of criminals being as prosocially motivated as non-criminals in an important type of distributive situations.

JEL Classification Numbers: C91, D63, K40.

Keywords Keyword Prosocial motivation · Criminals

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1 Introduction

Criminal behavior has significant direct costs for society and considerable resources are used on crime prevention. Close to ten million individuals are held in penal institutions around the world (Walmsley, 2009) and in the US alone, 227 billion USD are spent each year to catch, prosecute, and punish offenders (Bureau of Justice Statistics, 2010). The prison population is considerably smaller in the European countries than in the US, but even in these countries as many as one third of all young males have been charged with at least one crime (Skardhamar, 2004). Criminal behavior is thus a pervasive and costly phenomenon and it is important to understand what explains such behavior. In particular, in the design of policies aimed at crime prevention or reintegration of criminals into society, it is crucial to understand why some people commit crimes while others do not.

It is well established that differences in circumstances are important in explaining differences in criminal behavior (Allingham and Sandmo, 1972; Becker, 1968; Gould, Weinberg, and Mustard, 2002; Horney, Osgood, and Marshall, 1995; Levitt, 1997; Lochner, 2004; McCarthy, 2002). The role of individual motivation, in particular prosocial motivation, is less well understood. The fact that criminal behavior typically has negative consequences for others provides a compelling reason to believe that criminals are less prosocially motivated than non-criminals. This hypothesis has not been carefully tested, however. Earlier comparisons of the prosocial motivation of criminals and non-criminals have relied on self-reported measures of moral judgments (Kohlberg, 1976, 1984; Palmer and Hollin, 1998; Tarry and Emler, 2007) or studied prosocial behavior when criminals interact with other criminals while they are imprisoned (Chmura, Engel, Englerth, and Pitz, 2010; Gummerum and Hanoch, 2012). The present study improves on this literature in a number of ways and allows a clean comparison of prosocial behavior of criminals and non-criminals when they make decision. Importantly, we study the prosocial behavior of criminals both inside and outside of prison and both when they interact with criminals and with non-criminals.

We report the results from two economic experiments, a lab experiment and an Internet experiment. Both experiments employ the classical dictator game where one participant, the dictator, is asked to determine how a sum of money should be distributed between himself and another participant, the receiver, with whom he is anonymously matched (Camerer, 2003; Engel, 2011). The key feature of this game is that it places the dictator in a situation where there is no potential economic benefit from sharing since the recipient has no opportunity to respond to the decision made by the dictator. How much the dictator gives to the receiver, as a share of the available money, is therefore commonly used as a measure of an individual's level of prosocial motivation.

In the lab experiment we find a striking similarity in the prosocial behavior of prisoners and a benchmark group recruited from the general population when making decisions in the dictator game. This result holds both when the prisoners interact with other prisoners and when they interact with participants from the benchmark group. In-group favoritism has been shown to be important for prosocial behavior in many contexts (Akerlof and Kranton, 2000; Bernhard, Fehr, and Fischbacher, 2006; Charness, Rigotti, and Rustichini, 2007; Chen and Li, 2009), but in our experiment we find no significant in-group effect for either of the two groups of participants.

Two concerns when interpreting the data from the lab experiment are that there might have been an experimenter demand effect and that imprisonment may have made the criminal identity of the prisoners salient (Cohn, Maréchal, and Noll, 2012). The Internet experiment, which was conducted with a large group of participants from the general population, allows us to address these two concerns. In the Internet experiment there was nothing to indicate that the purpose of the experiment was to compare criminals and non-criminals and all subjects could participate in the experiment from their home. By linking the behavioral data from the Internet experiment to official criminal records, we could compare the average level of prosocial behavior of individuals with and without a criminal record. The

results are in line with the results from the lab experiment: we find no significant difference in the prosocial behavior of individuals with and without a criminal record.

We interpret the finding in the two experiments as providing evidence of criminals being as prosocially motivated as non-criminals in an important type of distributive situations. If we assume cross-situational consistency in social preferences, this suggests that the prosocial motivation captured by the dictator game is of little importance in explaining criminal behavior. We cannot, however, exclude the possibility that criminal behavior is affected by differences in prosocial motivation that are not captured by the dictator game or that there is weak cross-situational consistency in social preferences (Levitt and List, 2007).

Section 2 presents the sampling procedure and the design of the lab experiment and the Internet experiment. Section 3 presents the results, while Section 4 discusses some implications of our findings.

2 Design

Below we describe the design and the sample in the the lab experiment and the Internet experiment.

2.1 The lab experiment

In the lab experiment we conducted 12 sessions with a total of 360 participants. Four sessions, with a total of 207 participants, were mixed sessions in which the prisoners and participants from a benchmark group interacted. Eight sessions, with a total of 153 participants, were single group sessions in which the participants only interacted with participants from their own group. In all sessions, participants were informed about how the other participants were recruited, but otherwise they did not receive any information about the other participants. In order to make the lab experience as similar as possible for the prisoners and the benchmark group, all procedures were the same for the two groups and no prison guards were present in the lab during the experiment in the prison.

The endowment to be distributed by the dictator in the mixed session was 1000 NOK (approximately 175 USD) and the participants could choose between six possible distributions. Each participant made two decisions as a dictator, once with a receiver from the prison group and once with a receiver from the benchmark group. In the single group session each participant was a dictator in one situation with an endowment of 1000 NOK and in one situation with an endowment of 500 NOK.[1] No individual participated in more than one session.

The 187 prisoners who participated in the experiment were all male inmates of Bjørgvin Prison, a medium security prison located outside the city of Bergen, Norway. All the inmates at the prison were given a written invitation to participate in the experiment at a meeting a few days in advance of each session. At this meeting we explained that the experiment was voluntary, that participants would not be asked to reveal any personal information, and that any information gathered in the experiment would be anonymous. In order to ensure anonymity we did not collect individual data about the prisoners' offences and the length of their prison sentence. The prison authorities provided, however, an overview of the distribution of crimes committed by the participants and the most common crimes were burglary, theft, drug related crimes and violence.

The prisoners were informed that in addition to a show-up fee they could earn extra money during the experiment, that all earnings would be paid in cash immediately after the experiment, and that they would not have to report their earnings from the experiment to the prison authorities. More than 90 percent of the prisoners accepted the invitation. For the prisoners, the experiment was conducted in a mobile computer lab that was set up in the prison gymnasium and no prison guards were present in the lab during the experiment.

The other group of participants consisted of 173 males selected randomly from the population living in the 27 basic statistical units closest to the Norwegian School of Eco-

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[1] There is no statistically significant difference in the average share given when the endowment is 500 NOK and 1000 NOK (Wald test: $p = 0.51$). In the analysis we only report the shares given.

nomics (NHH) in Bergen.[2] These basic statistical units include parts of the second largest city in Norway as well as a less populated rural area, and the population is close to the national average with respect to the distribution of income, education and occupation. The inmates at Bjørgvin prison are on average younger than the general population, and we stratified the invitations so that the age profile of the benchmark group was approximately the same as for the prisoners.[3] Table 1 reports the characteristics of the two groups based on self-reported age, education and work experience. We observe that the two groups are very similar with respect to age and work experience, but that a somewhat higher share of the benchmark group has completed secondary education.

[Table 1 about here.]

The benchmark group received an invitation letter similar to the one received by the prisoners and they were given the same instructions during the experiment. For the benchmark group, the experiment was conducted at NHH in a computer lab of the same type as the one in Bjørgvin Prison.[4] In the mixed sessions, participants in the lab at Bjørgvin Prison and at NHH interacted in real time via the Internet.

At the end of the experiment, one of the decisions was randomly selected to determine the final payment. Payments were made in cash using a procedure ensuring that neither the other participants nor the experimenters knew what decisions any particular participant had made.

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[2] A basic statistical unit is the smallest geographical unit used by Statistics Norway.

[3] The selection procedure was approved by the Norwegian Social Science Data Services ("Norsk samfunnsvitenskaplig datatjeneste") and the Norwegian Public Register ("Norsk Folkeregister").

[4] To compensate the benchmark group for the additional time and costs incurred by this group in order to come to the lab, the show-up fee for the benchmark group, 300 NOK, was higher than the show-up fee for the prisoners, 100 NOK. The participants were not informed about the other group's show-up fee.

2.2 The Internet experiment

The Internet experiment was conducted using The Internet Laboratory for Experimental Economics (iLEE) at the University of Copenhagen, which provides a platform for running large-scale experiments over the Internet. Participants were recruited from the general Danish adult population and were randomly selected for invitation by Statistics Denmark. The dictator game was part of the second wave of experiments conducted on this platform and invitations were sent to the approximately 2300 participants who had finished the first wave.

In order to ensure the participants' anonymity in the experiment, Statistics Denmark generated a unique and random six-digit id-number for each individual. The invitation letter, which was distributed to the participants by Statistics Denmark, included a URL to the experiment's website, and a unique login code which the invitee had to enter on the website in order to access the experiment. The invitees had seven days to respond.

Participants were randomly matched in pairs. The endowment to be distributed by the dictator was 150 DKK (approximately 27 USD) and the dictator could choose between 11 possible distributions. Each participant was involved in two situations, one as a dictator and one as receiver. After the experiment, one of the two situations was randomly drawn to determine the payment. Subjects were paid via electronic bank transfers, which is common practice in Denmark. The payments were made by Statistics Denmark to ensure that the participants were anonymous for the experimenters.

After the experiment was completed, Statistics Denmark matched at the individual level the experimental data with official register data, using the six-digit personal id-number. The official register data includes official criminal records containing information about offenses and sanctions in the period from 1980 to 2009. In our sample 34 participants had received at least one prison sentence in the period and an additional 344 participants had been sentenced to a fine.

Using official register data we can also compare the gender, age, education and work experience of those with who has been sentenced (to imprisonment or to a pay a fine) and the other the participants in the experiment. We observe from Table 2 that the share of females being much lower among those with a criminal record than among the rest of the participants, 0.27 versus 0.53, otherwise the two groups are quite similar.

[Table 2 about here.]

3 Results

Figure 1 provides histograms of the share given in the lab experiment. From the upper left panel in Figure 1 we observe that the large majority of the prisoners, 89 percent, gave a share of the endowment to the other prisoner. Strikingly, we observe, from the left panels in Figure 1, that the distribution of share given is very similar when the prisoner shared with a person from the benchmark group. The average share given to a participant from the benchmark group, 34.2 percent, is only slightly lower than the average share given to another prisoner, 37.0 percent (Wald test: $p = 0.136$).[5] Thus, the distributive behavior of the prisoners provides clear evidence of criminals being prosocially motivated both when they interact with criminals and when they interact with non-criminals.

[Figure 1 about here.]

From comparing the left and the right panels in Figure 1, we observe that the the prisoners and the benchmark group make very similar choices. There is no statistically significant difference in what the two groups on average gave in situations where they were matched with prisoners (Wald test: $p = 0.601$) or in situations where they were matched with the benchmark group (Wald test: $p = 0.426$).[6] This similarity in prosocial behavior

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[5] The Wald-tests here and below use Huber-White standard errors that are corrected for repeated observations of individuals where appropriate.

[6] When the receiver is prisoner Mann-Whitney: $p = 0.658$ and the Kolmogorov-Smirnov test of equality of distributions: $p = 0.108$. When the receiver is from the benchmark group Mann-Whitney test: $p = 0.850$ and the

is confirmed by column (1) in Table 3, which reports a regression of the share given on participant group and background variables. We observe that the coefficient for the dictator being a prisoner is small and not statistically significant ($p = 0.72$).

From column (1) we also observe that the coefficient for the receiver being a prisoner is positive and significant ($p = 0.001$). The positive effect of the receiver being a prisoner is not, however, a result of an in-group effect among the criminals. From column (2) in Table 3, which includes the interaction effect between the dictator being a prisoner and the receiver being a prisoner, we observe that there is no significant difference in the average share given by the benchmark group and the prisoners when the receiver is a prisoner ($p = 0.343$).

[Table 3 about here.]

Data from the Internet experiment allow us to examine whether the results from the lab experiment hold for a group of participants with a criminal record who were not imprisoned at the time of the experiment.

[Figure 2 about here.]

The upper left panel in Figure 2 reports the histogram of the share given by the participants who had been sentenced to imprisonment and the upper right panel reports the histogram of share given by the rest of the participants. We observe that the two distributions are strikingly similar and the difference in average share given is small, 30.8 percent versus 33.8 percent, and not statistically significant (t-test: $p = 0.410$).[7]

Kolmogorov-Smirnov test of equality of distributions: $p = 0.631$. For individuals with repeat observations, we take the average of the share given before applying the Mann-Whitney tests. For the Kolmogorov-Smirnov tests, we look only at the case where the endowment is 1000 NOK. Here and below, we report the p-values for the Kolmogorov-Smirnov test statistic are calculated using a permutation test procedure with 10 000 permutations (since the standard distribution theory for the Kolmogorov-Smirnov statistic relies on continuously distributed outcomes).

[7] The Mann-Whitney test: $p = 0.612$ and the Kolmogorov-Smirnov test of equality of distributions: $p = 0.516$).

The two lower panels in Figure 2 allow us to compare the distribution of the share given by participants who had either been sentenced to imprisonment or to pay a fine (not including fines for minor offenses) with the share given by the rest of the participant. Again there is no statistically significant difference in share given, 32.7 percent versus 34.1 percent (*t*-test: $p = 0.236$).[8] Column (3) in Table 3, confirms that there is no statistically significant difference in the prosocial behavior of participants with a criminal record and participants without a criminal record also when controlling for background variables.

In column (4) in Table 3, we examine whether particular groups of criminals, specifically those who were convicted for the most serious crimes, those with the most recent sentence, and those who were convicted for economic crimes, behave less prosocially than others with a criminal record. We observe that the coefficients for these dummies have the expected sign, but that the effects are small and not statistically significant.[9]

4 Discussion

Taken together, the results from the lab experiment and the Internet experiment show that criminals behave as prosocially as the general population when making decisions in the dictator game. This holds both when they interact with other criminals and with the general population and it holds both inside and outside of prison. This is a striking result in light of the fact that the share given in the dictator game has been the dominant measure of prosocial motivation in the recent economic literature. Assuming some cross-situational consistency in social preferences, our results suggest that the prosocial motivation captured by the dictator game is of little importance in explaining criminal behavior.

We believe that the results from our experiments shed light on the public debate on crime prevention policies, penal systems and reintegration of criminals into society. A common perception in these debates is that criminals are bad guys who lack prosocial motiva-

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[8] Mann-Whitney test: $p = 0.508$ and the Kolmogoro-Smirnov test of equality of distributions: $p = 0.073$.

[9] Regressions with each of these dummies included separately show that the average share given by participants from these groups are not significantly different from the average share given by the other participants.

tion and this perception may potentially be used to justify harsh sentencing of criminals and prevent reintegration of criminals in society. Our results suggests that this perception needs to be nuanced and that criminals in an important set of situations are equally prosocially motivated as the general population.

References

Akerlof GA, Kranton RE (2000) Economics and identity. Quarterly Journal of Economics 115(3):715–753

Allingham MG, Sandmo A (1972) Income tax evasion: A theoretical analysis. Journal of Public Economics 1(3-4):323–338

Becker GS (1968) Crime and punishment: An economic approach. Journal of Political Economy 76(2):169–217

Bernhard H, Fehr E, Fischbacher U (2006) Group affiliation and altruistic norm enforcement. American Economic Review 96(2):217–21

Bureau of Justice Statistics (2010) Justice expenditure and employment extracts, 2007. http://bjs.ojp.usdoj.gov/index.cfm?ty=pbdetail&iid=2315

Camerer CF (2003) Behavioral Game Theory: Experiments in Strategic Interaction. Princeton University Press, Princeton, NJ

Charness G, Rigotti L, Rustichini A (2007) Individual behavior and group membership. American Economic Review 97(4):1340–52

Chen Y, Li SX (2009) Group identity and social preferences. American Economic Review 99(1):431–457.

Chmura T, Engel C, Englerth M, Pitz T (2010) At the mercy of the prisoner next door. Preprints of the Max Planck Institute for Research on Collective Goods Bonn 2010/27

Cohn A, Maréchal M, Noll T (2012) Bad boys: The effect of criminal identity on norm violation. mimeo, University of Zurich

Engel C (2011) Dictator games: A meta study. Experimental Economics 14(4):583–610

Gould ED, Weinberg BA, Mustard DB (2002) Crime rates and local labor market opportunities in the united states: 1979-1997. The Review of Economics and Statistics 84(1):45–61

Gummerum M, Hanoch Y (2012) Altruism behind bars: Sharing, justice, perspective taking and empathy among inmates. Social Justice Research 25:61–78

Horney J, Osgood W, Marshall IH (1995) Criminal careers in the short-term: Intra-individual variability in crime and its relation to local life circumstances. American Sociological Review 60(5):655–673

Kohlberg L (1976) Moral stages and moralization: The cognitive-developmental approach. In: Lickona T (ed) Moral Development and Behavior: Theory, Research, and Social Issues, New York: Holt, Rinehart and Winston, pp 31–53

Kohlberg L (1984) Essays in Moral Development. Vol II: The Psychology of Moral Development. Harper and Row, San Francisco

Levitt SD (1997) Using electoral cycles in police hiring to estimate the effects of police on crime:. American Economics Review 87(3):270–290

Levitt SD, List JA (2007) What do laboratory experiments measuring social preferences reveal about the real world? Journal of Economic Perspectives 21(2):153–174

Lochner L (2004) Education, work, and crime: A human capital approach. International Economic Review 45(3):811–843

McCarthy B (2002) New economics of sociological criminology. Annual Review of Sociology 28:417–442, DOI 10.1146/annurev.soc.28.110601.140752

Palmer EJ, Hollin CR (1998) A comparison of patterns of moral development in young offenders and non-offenders. Legal and Criminological Psychology 3(2):225–235

Skardhamar T (2004) Noen få veier tungt i kriminalitetsbildet. Samfunnsspeilet 3:25–31

Tarry H, Emler N (2007) Attitudes, values and moral reasoning as predictors of delinquency. British Journal of Developmental Psychology 25(2):169–183

Walmsley R (2009) World prison population list, eighth edition. International Centre for Prison Studies
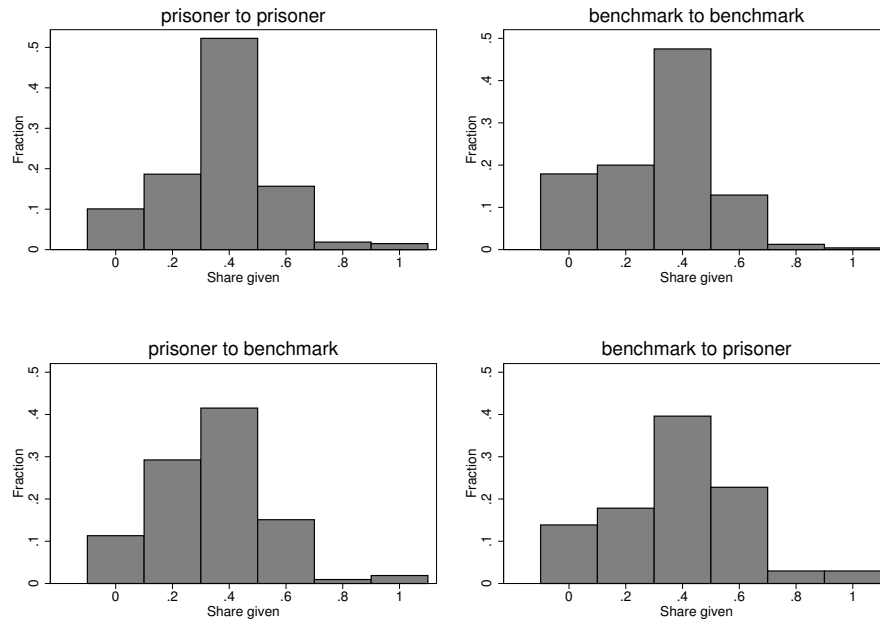
Fig. 1 Histograms of share given - lab experiment

Share given is the share of the money given to the other participant in the dictator game, where the dictator had to choose between six alternative shares: $0, 0.2, 0.4, \ldots, 1$. The upper left panel reports the histogram of the share given by the prisoners when the receiver is prisoner, the upper right panel reports the histogram of the share given by the benchmark group when the receiver is prisoner, the lower left panel reports the histogram of the share given by the prisoners when the receiver is from the benchmark group and the lower right panel reports the histogram of the share given by the benchmark group when the receiver is from the benchmark group.
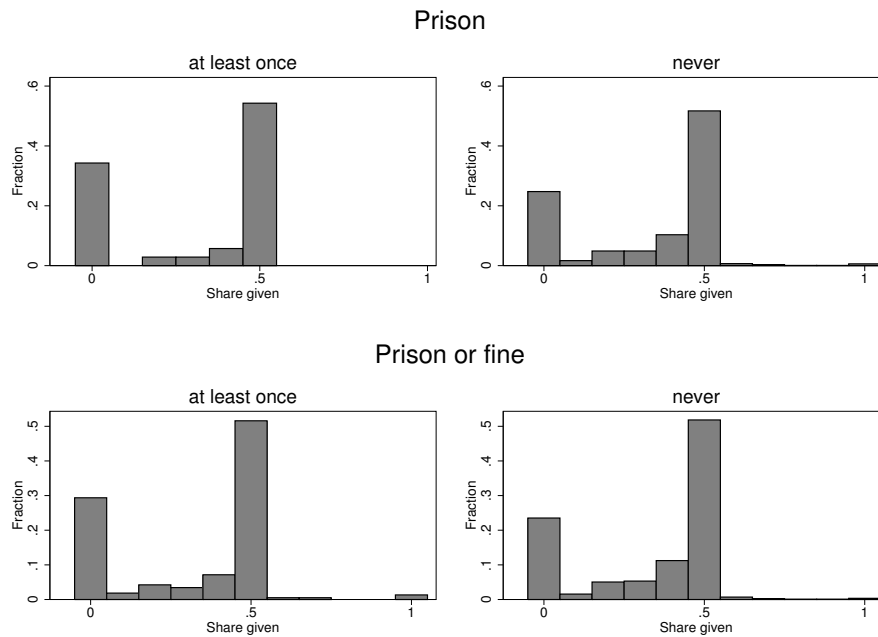
Fig. 2 Histograms of share given - Internet experiment

Share given is the share of the money given to the other participant in the dictator game, where the dictator had to choose between eleven alternative shares: $0, 0.1, 0.2, \ldots, 1$. The upper left panel reports the histogram of the share given by the participants who received a prison sentence (suspended or unsuspended) at least once between 1980 and 2009 (34 participants) and upper right panel reports the share given by the rest of the participants. The lower left panel reports the histogram of the share given by the participants who either received a prison sentence (suspended or unsuspended) or was fined at least once between 1980 and 2009 (378 participants) and lower right panel reports the share given by the rest of the participants.

Table 1 Sample characteristics - lab experiment

	Prisoners	Benchmark
Above 25 years old	0.764	0.774
	(0.031)	(0.032)
Completed secondary school	0.631	0.879
	(0.035)	(0.025)
At least five years work experience	0.727	0.722
	(0.037)	(0.034)
n	187	173

Note: The table reports the background characteristics of the prisoners and the benchmark group in the lab experiment. "Above 25 years old" is a dummy for the participant's age being above 25 years, "Completed secondary school" is a dummy for the participant having completed secondary education, and "At least five years work experience" is a dummy for the participant having at least five years work experience. Standard errors in parentheses.

Table 2 Sample characteristics - Internet experiment

	Sentenced	Not sentenced
Female	0.278	0.555
	(0.023)	(0.015)
Above 25 years old	0.976	0.880
	(0.008)	(0.01)
Completed secondary school	0.854	0.873
	(0.018)	(0.010)
At least five years work experience	0.952	0.874
	(0.011)	(0.010)
n	378	1148

Note: The first table reports the background characteristics of the participants who have been sentenced (either to imprisonment or to pay a fine) in the period from 1980 to 2009 and the rest of the participants in the Internet experiment. "Female" is a dummy for the participant being a female, "Above 25 years old" is a dummy for the participant's age being above 25 years, "Completed secondary school" is a dummy for the participant having completed secondary education, and "At least five years work experience" is a dummy for the participant having at least five years work experience. Standard errors in parentheses.

Table 3 Regressions of share given on participant group and background variables

	Lab experiment		Internet experiment	
	(1)	(2)	(3)	(4)
Prisoner	0.008	0.021		
	(0.022)	(0.025)		
Receiver prisoner	0.046	0.060		
	(0.014)	(0.021)		
Prisoner × Receiver prisoner		-0.027		
		(0.028)		
Sentenced			-0.016	-0.008
			(0.014)	(0.017)
Prison sentence				-0.023
				(0.043)
Recent sentence				-0.011
				(0.023)
Economic crime				-0.022
				(0.056)
Female			0.023	0.023
			(0.012)	(0.012)
Age	0.037	0.036	0.087	0.087
	(0.028)	(0.028)	(0.024)	(0.024)
Education	0.020	0.018	-0.021	-0.021
	(0.023)	(0.023)	(0.017)	(0.017)
Work experience	0.024	0.024	-0.023	-0.024
	(0.026)	(0.026)	(0.023)	(0.023)
Constant	0.263	0.261	0.290	0.290
	(0.032)	(0.033)	(0.025)	(0.025)
Observations	715	715	1522	1522
R^2	0.028	0.029	0.015	0.016

Note: Regression of share given in the lab experiment and the Internet experiment on participant group and background variables. "Prisoner" is a dummy for the participant being a prisoner and "Receiver prisoner" is a dummy for the other participant being a prisoner. "Prison * Receiver prisoner" is an interaction variable of "Prisoner" and "Receiver Prisoner". "Sentenced" is a dummy for the participant in the Internet experiment being sentenced to either prison or a fine (in the period from 1980 to 2009), while "Prison sentence" is dummy for the participant being sentenced to prison (in the period from 1980 to 2009). "Recent sentence" is a dummy for the most recent sentence being after year 2000. "Economic crime" is a dummy for the participant having been sentenced for an economic crime. "Female" is a dummy for the participant experiment being a woman. "Age", "Education" and "Work experience" are dummies for the participant's age being above 25 years old, for the participant having completed secondary education, and for the participant having at least five years work experience. Standard errors (in parentheses) are corrected for repeated observations of individuals in the lab experiment.