Online Appendixes for "Cooperating With the State: Evidence from Survey Experiments on Policing"

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Online Appendix A: Theoretical Framework

In this appendix, we develop a "calculus of cooperation," adapted from Riker and Ordeshook (1968), to identify various potential determinants of cooperation. We subsequently use this theoretical framework to describe our empirical strategy.

Let a denote the decision to report a crime, where $a = 1$ indicates that the citizen reports, whereas $a = 0$ indicates that the citizen does not report. Reporting a crime may increase the probability that the crime is solved, where the benefit to the citizen of solving the crime is $v \geq 0$; we normalize to zero the benefit of not solving the crime. In addition, the citizen may derive some benefit from cooperating with the police, independent of whether the crime is solved. We denote this benefit by $r \geq 0$. Finally, reporting a crime may be costly, where $c \geq 0$ denotes the cost.

The expected payoff to the citizen from reporting the crime is therefore:

$$\Pr\left(\text{crime solved} \mid a = 1\right) \cdot v + \left[1 - \Pr\left(\text{crime solved} \mid a = 1\right)\right] \cdot 0 + r - c.$$

The citizen receives the payoff v if and only if the crime is solved, whereas the payoff r is received and cost c incurred regardless of whether the crime is solved. (In this decision-theoretic framework, it is useful to think of the probabilities as subjective, that is, as the perceived probability that the crime will be solved, conditional on the citizen's action.) Similarly, the expected payoff from not reporting the crime is

$$\Pr\left(\text{crime solved} \mid a = 0\right) \cdot v + \left[1 - \Pr\left(\text{crime solved} \mid a = 0\right)\right] \cdot 0.$$

The citizen prefers to report the crime if the first expression is greater than the second, or

$$\left[\Pr\left(\text{crime solved} \mid a = 1\right) - \Pr\left(\text{crime solved} \mid a = 0\right)\right] \cdot v \geq c - r. \tag{A1}$$

In words, the benefit of seeing the crime solved, weighted by the marginal probability that reporting the crime results in its being solved, must be greater than the cost of reporting the crime, net of any other benefits of doing so.

Condition A1 is formally identical to that derived by Riker and Ordeshook (1968) in their study of the "calculus of voting." Nonetheless, the empirical implications in our setting are quite different. Although it is extraordinarily unlikely that a single citizen's vote would swing an election in large electorates—a fact that leads Riker and Ordeshook to emphasize the civic duty of voting (analogous to r in our setting)— the marginal probability that reporting a crime to the police will result in its being solved is often substantial. Victims and bystanders may possess uniquely valuable information, such that they act as "gatekeepers" who decide whether to help the state do its job (Bowles et al. 2009). Our empirical strategy recognizes this possibility by exploring various elements of Condition A1.

As illustration, consider a treatment T that varies the benefit of solving the crime, where $T = 0$ corresponds to the state where this benefit is low, and $T = 1$ corresponds to the state where this benefit is high. Further, assume a linear probability model based on Condition A1, where the probability of reporting the crime, conditional on the treatment T, is

$$\Pr(a = 1 \mid T = 0) = [\Pr(\text{crime solved} \mid a = 1) - \Pr(\text{crime solved} \mid a = 0)] \cdot v_0 + r - c + \epsilon_0, \quad \text{(A2)}$$

$$\Pr(a = 1 \mid T = 1) = [\Pr(\text{crime solved} \mid a = 1) - \Pr(\text{crime solved} \mid a = 0)] \cdot v_1 + r - c + \epsilon_1. \quad \text{(A3)}$$

The variables v_0 and v_1 represent the benefits of solving the crime in the states $T = 0$ and $T = 1$, respectively, whereas ϵ_0 and ϵ_1 are stochastic terms.

The problem of causal inference is that for any particular citizen making a decision about whether to report a crime, we observe the decision only for the case where $T = 0$ or $T = 1$, not for both simultaneously. Formally, the probability that the citizen reports the crime can be represented as a function of T, as follows:

$$\Pr(a = 1) = (1 - T) \cdot \Pr(a = 1 \mid T = 0) + T \cdot \Pr(a = 1 \mid T = 1).$$

Substituting in from Equations A2 and A3 gives

$$\begin{aligned} \Pr(a = 1) = {} & [\Pr(\text{crime solved} \mid a = 1) - \Pr(\text{crime solved} \mid a = 0)] \cdot v_0 + r - c \\ & + [\Pr(\text{crime solved} \mid a = 1) - \Pr(\text{crime solved} \mid a = 0)] \cdot (v_1 - v_0) \cdot T \quad \text{(A4)} \\ & + \epsilon_0 + (\epsilon_1 - \epsilon_0) \cdot T. \end{aligned}$$

The causal effect of increasing the benefit from solving the crime v is the interactive effect of two terms: the (subjective) marginal probability that the crime is solved and the increase in the benefit of solving the crime. This illustrates that the treatment effect may be conditioned on contextual variables such as citizens' trust in the police to act on the information provided.

With observational data, it would be difficult to identify the causal effect of increasing the benefit of solving the crime, as in general the error term in Equation A4, $\epsilon_0 + (\epsilon_1 - \epsilon_0) \cdot T$, will be correlated with the treatment variable T. In contrast, successful random assignment of manipulations ensures that T is independent of the probabilities given by Equations A2 and A3.

Online Appendix B: Survey implementation

We hired a leading polling firm based in Moscow to conduct a face-to-face survey of 1,550 adult residents of Moscow in late 2011. Our contracted firm, the Levada Center, is one of the most respected polling agencies in Russia, with more than twenty years of experience

Table A1: Item Non-Response: Incidence and Correlations

		Correlations	
	Incidence	Experiment 1	Experiment 2
Experiment 1	0.045		
Experiment 2	0.077	0.088	
Experiment 3	0.023	0.155	0.151

and a long list of clients, including the World Bank, the EBRD, and many scholars from Europe and the United States. The sample was designed to be representative of the city population. We employed a multi-stage stratification strategy, first establishing the proportion of respondents to be chosen in each of Moscow's ten administrative districts (*okruga*) based on their share of the population. Within each administrative district, we selected from one to seven regions (*raiony*). The probability that each region was selected was weighted according to population. In all, we included 51 of Moscow's 123 regions in the sample. At the next stage, interviewers selected three to four electoral districts within each region and sampled households within each electoral district. We included quotas based on age and gender to ensure that women and the elderly were not overrepresented.

Interviewers spoke with respondents face-to-face and alone at their homes; the survey took place November 25 to December 25. There were 61 interviewers: all women, predominantly from 25 to 54 years old, most having previously conducted more than six surveys. Only one respondent per household took part in the survey. A total of 4,991 visits were made to selected addresses, 31% of which resulted in successful interviews. Of the 3,441 unsuccessful visits, 60% were unsuccessful because the individual refused to open the door to take part in the survey, whereas the remaining 40% were not home or were unable to take part in the survey due to language or not meeting sampling criteria. Forty percent of those who took part in the survey were telephoned to check the accuracy of their responses as reported by the interviewers.

Table A1 describes item non-response for the three survey experiments used in this paper, whereas Table A2 shows how item non-response is related to treatment status and demographic controls in each survey experiment. Although non-response is largely uncorrelated with these variables, participants were statistically significantly less likely to respond to versions of the first survey experiment with the "police" than with the "stranger" treatment. Nonetheless, as Figure 1 in the paper shows, the absolute level of non-response is low in both cases. Table A3, in turns, demonstrates that the somewhat higher overall non-response in Survey Experiment 2 is driven to some extent by disproportionately high non-response in a handful of regions.

Randomization and Balance

Randomization into treatment groups was conducted at the question level. Thus, treatment status in any given survey experiment is unrelated to treatment status in any other survey

Table A2: Item Non-Response by Question

	Question 1		Question 2		Question 3	
	(1)	(2)	(3)	(4)	(5)	(6)
Stranger	−0.647**	−0.847***				
	(0.261)	(0.311)				
Beating	0.011	−0.049				
	(0.247)	(0.278)				
Civic duty			−0.183	−0.172		
			(0.192)	(0.209)		
Reward			0.064	−0.021		
			(0.192)	(0.209)		
Busy					−0.433	−0.391
					(0.357)	(0.389)
High value					0.261	0.217
					(0.350)	(0.379)
Age/100		1.017		−0.765		0.451
		(0.919)		(0.692)		(1.285)
Male		−0.216		−0.395*		−0.217
		(0.284)		(0.216)		(0.387)
Material security		−0.509**		−0.536***		−0.247
		(0.199)		(0.150)		(0.273)
Education		−0.092		−0.052		−0.023
		(0.084)		(0.063)		(0.114)
Interaction with police		0.263		−0.041		0.181
		(0.297)		(0.222)		(0.423)
Occurrence of crime in past 12 months		−1.528		0.150		0.845
		(1.023)		(0.382)		(0.522)
Know location of nearest police station		−0.173		−0.264		0.183
		(0.305)		(0.228)		(0.451)
New to Moscow		−0.211		−0.595*		0.062
		(0.455)		(0.341)		(0.516)
Russian nationality		−0.168		−0.868**		−0.539
		(0.545)		(0.340)		(0.631)
Constant	−2.806***	−0.725	−2.440***	1.333	−3.747***	−2.740*
	(0.195)	(1.123)	(0.165)	(0.812)	(0.291)	(1.465)
Observations	1,549	1,366	1,548	1,365	1,549	1,366
Log Likelihood	−278.866	−218.757	−416.605	−350.186	−162.468	−136.834

Notes: Logit models. Standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

Table A3: Item Non-Response Across Strata

Okrug	Sampled N	SE1 NR	SE2 NR	SE3 NR	Region ID	Sampled N	SE1 NR	SE2 NR	SE3 NR
Eastern	200	0.060	0.115	0.025	2	32	0.125	0.562	0.094
					5	43	0.000	0.000	0.000
					7	32	0.125	0.000	0.000
					10	31	0.032	0.000	0.000
					11	31	0.097	0.161	0.065
					16	31	0.000	0.000	0.000
Western	168	0.042	0.083	0.065	20	29	0.034	0.034	0.069
					21	28	0.036	0.214	0.179
					22	28	0.000	0.000	0.000
					24	27	0.074	0.037	0.037
					26	28	0.071	0.000	0.000
					28	28	0.036	0.214	0.107
Zelenograd	29	0.034	0.000	0.034	30	29	0.034	0.000	0.034
Northern	146	0.096	0.274	0.041	39	29	0.034	0.069	0.000
					40	30	0.133	0.500	0.133
					41	28	0.071	0.250	0.036
					42	30	0.133	0.167	0.000
					44	29	0.103	0.379	0.034
Northeastern	173	0.023	0.058	0.012	52	29	0.000	0.000	0.034
					56	25	0.000	0.000	0.000
					59	30	0.033	0.033	0.000
					62	29	0.000	0.000	0.000
					64	30	0.100	0.300	0.033
					66	30	0.000	0.000	0.000
Northwestern	120	0.000	0.017	0.008	70	30	0.000	0.033	0.033
					72	30	0.000	0.033	0.000
					73	30	0.000	0.000	0.000
					75	30	0.000	0.000	0.000
Central	107	0.028	0.047	0.028	80	42	0.048	0.071	0.071
					82	44	0.000	0.023	0.000
					85	21	0.048	0.048	0.000
Southeastern	173	0.104	0.092	0.006	86	30	0.000	0.000	0.000
					89	28	0.107	0.250	0.000
					90	29	0.069	0.103	0.000
					91	29	0.414	0.138	0.034
					95	29	0.034	0.069	0.000
					97	28	0.000	0.000	0.000
Southwestern	202	0.035	0.020	0.005	100	30	0.033	0.000	0.000
					101	30	0.100	0.067	0.000
					102	23	0.000	0.000	0.000
					105	31	0.032	0.000	0.000
					107	29	0.000	0.034	0.000
					108	29	0.034	0.034	0.034
					109	30	0.033	0.000	0.000
Southern	232	0.013	0.017	0.013	111	33	0.030	0.061	0.030
					114	40	0.000	0.025	0.025
					116	32	0.031	0.031	0.031
					119	32	0.031	0.000	0.000
					121	31	0.000	0.000	0.000
					123	32	0.000	0.000	0.000
					125	32	0.000	0.000	0.000

experiment.

As illustrated by Tables A4–A6, our randomization resulted in approximately equal numbers of respondents receiving each treatment. Figure A1 below indicates balance across our pre-treatment variables that is fully within statistical expectations. Twelve out of 81 p-values

Table A4: Crime severity and perpetrator identity: assignment and response

	Police officer	Stranger	Total
Stealing	408	383	791
	(368)	(370)	(756)
Beating	395	363	758
	(371)	(353)	(724)
Total	803	746	1,549
	(757)	(723)	(1,480)

Note: Cells provide the number of subjects assigned to the indicated treatment, with the number of responses in parentheses.

Table A5: Civic duty and monetary reward: assignment and response

	No reward	Reward	Total
No civic-duty frame	376	398	774
	(350)	(360)	(710)
Civic-duty frame	382	392	774
	(352)	(368)	(720)
Total	758	790	1,548
	(702)	(728)	(1,430)

Note: Cells provide the number of subjects assigned to the indicated treatment, with the number of responses in parentheses.

are below 0.10, roughly what we would expect to observe by chance.

Table A6: Opportunity cost of time and crime severity: assignment and response

	Low-value robbery	High-value robbery	Total
No "busy" frame	415	385	800
	(405)	(374)	(779)
"Busy" frame	361	388	749
	(356)	(380)	(736)
Total	776	773	1,549
	(761)	(754)	(1,515)

Note: Cells provide the number of subjects assigned to the indicated treatment, with the number of responses in parentheses.

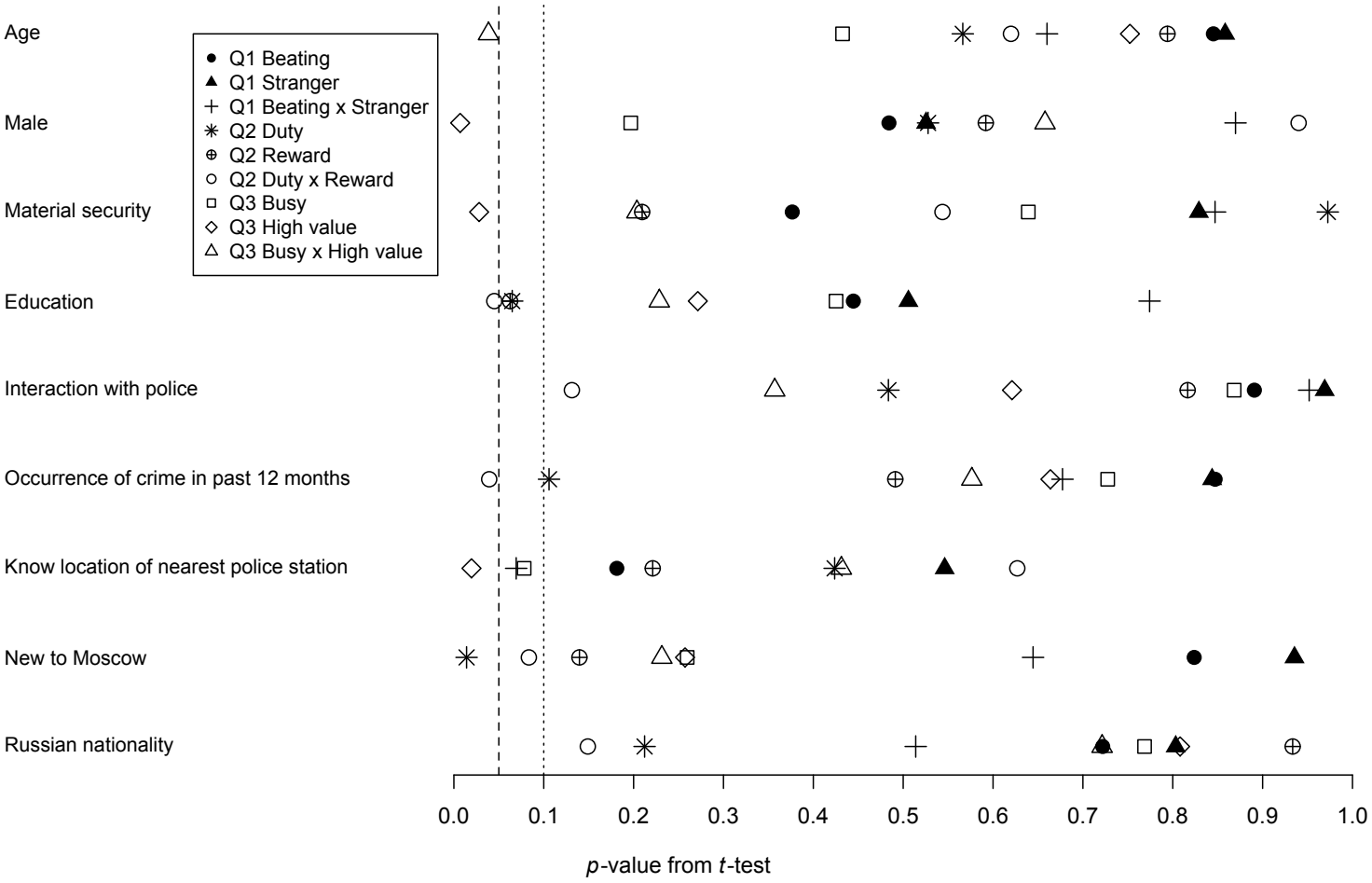

Figure A1: Balance of Pre-Treatment Variables

Spillovers

As noted above, the three survey experiments presented in this paper were embedded within a larger set of eight survey experiments, split into two blocs that were presented approximately one-third and two-thirds of the way through the survey instrument. The order in which the survey experiments were presented to respondents was fixed. Table A7 shows how treatment assignment from previously-asked questions affects the outcomes we study in this paper. As Survey Experiment 1 was the first survey experiment presented to respondents, there are no earlier treatment assignments and so we omit this experiment from spillover analysis. Survey Experiment 2 was the fifth survey experiment presented. The model in Column 1 of Table A7 regresses responses to Survey Experiment 2 on the four treatment indicators from Survey Experiments 1 and 3. Column 2 extends this with treatment indicators from the other two survey experiments (not analyzed in this paper) included in the first block. Columns 3 and 4 repeat Columns 1 and 2 but also with treatment indicators from Survey Experiment 2. Finally, Columns 5 and 6 reproduce Columns 1 and 3 but with the outcome variable for Survey Experiment 3 as the dependent variable and previous treatments (i.e., those from Survey Experiment 1) as predictors.

None of the treatment indicators from prior experiments is significantly correlated with outcomes from Survey Experiment 2. Relative to the results reported in Column 3 of Table 5 in the paper, there is a loss of magnitude on the estimated duty-reward interaction term, with corresponding loss of significance, but the difference is small. With respect to Survey Experiment 3, outcomes are significantly correlated with whether respondents received the "beating" treatment in Survey Experiment 1, but the estimated treatment effects from Survey Experiment 3 itself are very similar to those reported in Table 6 of the paper. Taken as a whole, our results do not appear to be driven by spillovers from prior survey experiments.

Table A7: Spillovers

	SE2 Outcome				SE3 Outcome	
	(1)	(2)	(3)	(4)	(5)	(6)
Stranger (SE1)	0.061	0.061	0.060	0.060	0.042	0.053
	(0.053)	(0.053)	(0.052)	(0.053)	(0.054)	(0.052)
Beating (SE1)	0.031	0.030	0.030	0.029	0.151***	0.135**
	(0.052)	(0.053)	(0.053)	(0.053)	(0.054)	(0.053)
Busy (SE3)	−0.051	−0.053	−0.051	−0.053		0.083
	(0.053)	(0.053)	(0.052)	(0.053)		(0.074)
High Value (SE3)	0.050	0.051	0.049	0.051		0.519***
	(0.053)	(0.053)	(0.053)	(0.053)		(0.073)
Busy × High Value (SE1)						−0.095
						(0.105)
Civic Duty (SE2)			−0.147**	−0.143*		
			(0.075)	(0.075)		
Reward (SE2)			−0.019	−0.017		
			(0.075)	(0.075)		
Civic Duty × Reward (SE2)			0.168	0.162		
			(0.105)	(0.105)		
Intervening Treatment 1		−0.007		−0.008		
		(0.023)		(0.023)		
Intervening Treatment 2		−0.026		−0.023		
		(0.023)		(0.023)		
Constant	3.733***	3.817***	3.775***	3.852***	4.028***	3.757***
	(0.057)	(0.102)	(0.074)	(0.112)	(0.046)	(0.061)
Observations	1,430	1,430	1,430	1,430	1,515	1,515
R-squared	0.002	0.003	0.006	0.007	0.006	0.058

Notes: OLS models. Dependent variables are outcomes for Survey Experiments (SE) 2 and 3, as noted at the top of the table. Standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

Descriptive Statistics and Covariate Question Wording

Table A8 presents basic descriptive statistics for the covariate variables employed in our analyses. Figure A2 shows the exact wording of the survey questions that were used to generate the covariates incorporated in our analysis. This text was translated from Russian by the authors.

Figure A2: Translated Wording of Covariate Questions in Survey

3. Which of the following descriptions most closely matches the material position of your family? (one response; 99 coded as missing)

1 there is not enough money even for food
2 there is enough money for food, but not enough to buy clothing and shoes
3 there is enough money for clothing and shoes, but not enough to buy a large household appliance
4 there is enough money for clothing and shoes, but we cannot buy a new car
5 there is enough money for a new car, but we cannot permit ourselves to buy an apartment or house
6 we experience no material difficulties, if needed we could acquire an apartment or house
99 difficulty answering

5. What kind of education do you have? (one response)

1 ninth-grade or less
2 basic professional, PTU
3 general secondary (10-11 grades)
4 secondary professional (specialized): technikum, kolledzh, etc.
5 incomplete higher: three or four grades of higher education without a diploma
6 higher, baccalaureate diploma
7 higher, specialist (five years)
8 higher, master's
9 graduate (Ph.D. level), ordinatura, etc.

We code respondents as having had contact with the police if they *did not* respond yes to option 8 below.
12. Have you had contact with members of internal affairs organs in the last 12 months? If yes, for which reasons? (unlimited number of responses; 9 coded as missing)

1 I needed help from a police officer
2 a police officer stopped me to check my documents
3 acquisition of documents (passport, etc.), a permit
4 I was brought in as a witness
5 a police office considered my actions to be unlawful and I was stopped or detained to establish the circumstances
6 I socialized with a police officer in an informal context
7 other (explain)
8 no contact
9 difficulty answering

We code respondents as having been the victim of a crime (binary) if they responded either 2 or 3 to question 14 below.
14. Have you personally been subject to any type of criminal act (theft, assault, fraud, or others) in the last 12 months? If so, how often? (one response; 99 coded as missing)

1 I have not been subject
2 I was subject one time
3 I was subject two or more times
99 difficulty answering

35. Do you know where the local police station is located in the raion in which you live? (yes/no/missing)

We consider respondents to be new to Moscow (binary) if they indicate having lived there since 2000 or more recent residence (Q60). Responses 'difficulty answering' are coded as missing.

We code respondents as being of Russian nationality (binary) if they indicated this in the free text question below, otherwise not.
67. To which nationality do you ascribe yourself? (free response)

Table A8: Descriptive statistics for covariates

Variable	Type	N	Min	Max	Median	Mean	SD	NR
Age/100	Integer	1550	0.18	0.85	0.43	0.43	0.16	0
Male	Binary	1550	0.00	1.00	0.00	0.47	0.50	0
Material security	Ordinal (6 cat)	1526	1.00	6.00	4.00	3.68	0.70	24
Education	Ordinal (9 cat)	1550	1.00	9.00	5.00	5.23	1.71	0
Interaction with police	Binary	1549	0.00	1.00	1.00	0.63	0.48	1
Crime in past 12 months	Binary	1544	0.00	1.00	0.00	0.08	0.26	6
Know nearest police station	Binary	1550	0.00	1.00	1.00	0.70	0.46	0
New to Moscow	Binary	1430	0.00	1.00	0.00	0.16	0.37	120
Russian nationality	Binary	1504	0.00	1.00	1.00	0.92	0.27	46