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Confusion or fairness in the field? Rejections in the ultimatum game under the strategy method[☆]

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Abstract

Field experiments conducted in two multi-ethnic republics of Russia show that responders employ varied strategies in an “ultimatum game”. While many responders choose strategies that are monotonically rational and characteristic of most ultimatum game results (rejecting low offers and accepting high ones), almost as many others display a tendency towards “hyper-fairness” (rejecting offers that are too low and too high). Proposers, in turn, seem to take this into account with an unusually high proportion of 50/50 splits. Drawing on data from the experiments and a related survey, this paper focuses on the variation in responders’ strategies, and the factors that account for the differences.

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1. Introduction

Only recently in experimental economics have experimentalists emerged from laboratories in our own universities and ventured out into the world. Ordinarily the aim of such studies has been to test whether theoretical models stand up to cultural variation. So far the record is mixed (see, for example, papers by Roth et al. (1991), Yamagishi et al. (1998), Ensminger (2000), Henrich (2000), Henrich et al. (2001), Oosterbeek et al. (2004), Buchan et al. (2002), Paciotti and Hadley (2003) and Ashraf et al. (2003)). Sometimes it seems that culture has an impact on behavior, but at other times the strategies played by subjects show remarkably similar patterns across a wide assortment of countries.

Most of these experiments depend on students from foreign universities, and few studies thus far have addressed the issue of heterogeneity within the population.¹ It may be that using homogeneous samples masks key elements of strategic behavior.

The experiment reported here focuses on population heterogeneity. It uses a random sample that allows us to test for effects due to age, income, ethnicity and place of residence. The larger study, of which it is a part, combines a face-to-face mass survey with a series of small-group bargaining games in two multiethnic regions of Russia, Tatarstan and Sakha-Yakutia. The two regions were the site of ethnic revivals by titular nationalities (Tatars and Yakuts) in the late 1980s and 1990s, making ethnicity especially salient. They have also experienced over ten years of Russia's turbulent market transition, with its legacy of heightened uncertainty and growing inequality. They thus offer a particularly good setting for evaluating potential variations in strategic behavior and in norms, and heterogeneity within the population.

We report on results from the ultimatum game. The game is straightforward and lends itself well to less-than-ideal field experimental conditions. Participants are randomly assigned to be proposers or responders; proposers offer an allocation of money to responders, and responders decide whether to accept or reject it. If a responder accepts, then both players get the proposed amount. If a responder declines, neither player gets anything.

The standard form of the ultimatum game allows responders to accept or reject the proposal they are offered, but it does not indicate how responders might react to other possible allocations. It thus gives us only limited purchase on what is driving responders' choices. To address that, we rely on the strategy method where responders indicate whether they will accept or reject each possible allocation. Thus we can evaluate responders' strategies across particular allocations and the degree to which strategies are the same among different segments of the sample.

Results from the experiment allow us to draw several conclusions. First, in a heterogeneous population, proposers overwhelmingly settle on an even split. Among responders we find evidence of two distinct strategies: "monotonically rational", with rejection of very low offers turning to consistent acceptances as offers increase, and "hyper-fair", with rejection of both very low and very high offers. Moreover, responder strategies vary systematically

¹ Recently, a handful of studies have gone into the field to examine heterogeneous populations (see the discussion in Henrich et al. (2001), Carpenter et al. (2003), Barr (2003), Eckel et al. (2003) and Cardenas and Carpenter (2003)).

with individual characteristics. Finally, it appears that proposers make offers that constitute a best reply strategy to norms of fairness.

2. Motivation

The ultimatum game is a standard instrument for laboratory experimentalists studying norms of fairness (Eckel and Wilson, 2001; Handgraaf et al., 2003). It has been replicated many times, with consistent results (see reviews by Thaler (1988), Güth and Tietz (1990), Roth (1995) and Camerer (2003)). It has also been tested in a variety of environments (see, for example, Roth et al., 1991; Slonim and Roth, 1998; Cameron, 1999; Henrich, 2000; Henrich et al., 2001).

The empirical findings show that proposers commonly offer equal splits, and responders commonly accept them. Thus the bulk of proposers offer somewhere between a 60/40 and a 50/50 split, and most responders accept. When proposers offer smaller shares, such as an 80/20 split, then most responders decline. It is, Camerer (1997) notes, as if subjects have an implicit notion of fairness that they bring to these games. Traditional equilibrium concepts from game theory predict neither fairness nor rejection and this has led to a growing literature seeking to explain both (see, e.g., Fehr and Schmidt, 1999; Bolton and Ockenfels, 2000; Rabin, 1993).

Most assessments of ultimatum games focus on proposers' behavior. Responders figure in the analysis chiefly when it comes to examining rejections. Their behavior is difficult to explore in more detail since the typical experiment allows them only to respond to a single offer. (Ultimatum games are usually run one time, with proposers suggesting an allocation and responders accepting or rejecting that allocation.) This generates a single observation for each pair of actors. Generally there are few rejections, so it is difficult to understand what it is that responders might prefer.

To get around this problem some researchers have used the "strategy method" (see, for example, Mitzkewitz and Nagel, 1993; Solnick and Schweitzer, 1999). Responders indicate in advance whether they would accept or reject each possible allocation. In the play of the game the experimenter then matches proposers and responders randomly and imposes the outcome. Responders do not have to anticipate any response by the proposer, so they are unconstrained by strategic behavior. Their decisions can thus provide some insight into what responders consider to be fair.²

Studies using the strategy method suggest that the logic of responses varies. With American students as subjects, Mitzkewitz and Nagel find that most subjects are monotonic in their behavior (only 10 out of 320 observed strategies deviate from this pattern) although there is

² Of course, there are cautions attendant with using the strategy method. Blount and Bazerman (1996) finds that subjects tend to accept lower offers when using something similar to the strategy method rather than announcing a minimal acceptable offer. Likewise Güth et al. (2001) suggest the elicitation method matters. However, Oosterbeek et al. (2004) are of two minds as to whether it makes a difference, and Brandts and Charness (2000) suggest that it does not. Whether the procedure raises or lowers offers or whether it lowers the minimal acceptable amount among responders is not of concern here. All subjects were run using the same protocol and as a consequence any differences we observe across subjects are due to heterogeneity.

considerable dispersion in the minimum amounts acceptable to responders. Rapoport et al. (1996) use a different variant of the ultimatum game with American students, but find the same monotonic pattern of rejections and acceptances. In contrast, ultimatum games run with Chinese students yield considerable violations of strict monotonicity (Hennig-Schmidt et al., 2002). In the modal set of strategies, subjects reject both low and high offers. Based on videotapes from the experiments, the authors conclude that subjects are using a fairness criterion to justify this deviation from monotonicity. Huck (1999) also reports substantial deviations from monotonic rationality among pupils from a German gymnasium. More than 60 percent of his subjects violate strictly monotonic strategy profiles.³

These studies are unable to explain why there may be this dispersion of types in the population. Is it that subjects vary systematically in their beliefs about fairness, or are they simply confused? We think that by making our sample more diverse and by collecting additional data concerning individual characteristics we can cast light on this question. After all, it is reasonable to expect that different ethnic groups or people from different socio-economic backgrounds may hold different norms.

Transitional societies such as the Russian Federation offer a particularly good environment for addressing the question of heterogeneity and attachment to norms of fairness. Market exchange has undercut old norms of egalitarianism; regard for the self-presumably replaces regard for the collective. But the penetration of new norms is uneven. Market mechanisms have spread more to urban areas than to villages, to predominantly Russian areas more than to minority regions and to younger generations more than older ones. The costs and benefits of the transition have spread unevenly as well. Income inequality, for example, has grown dramatically since the advent of market reforms in the early 1990s.

Our focus on Tatarstan and Sakha offers the opportunity to explore the differences in detail. Both regions are multiethnic, with the titular nationality and Russians comprising more than 85 percent of the population in each case. Both have also pursued a mixed or “soft” transition from central planning, with continued economic regulation, limited privatization and substantial social protections (Koroteeva, 2000; Bahry, 2005). Their economic performance (and levels of poverty and unemployment) has typically fallen in the middle of the spectrum of Russia’s 89 regions in the past 12 years (Bahry, 2002). We would not want to suggest that they are necessarily representative of the country as a whole, but they do allow us to determine whether norms vary systematically among different groups.

3. Research design

We turn first to an explanation of the design of our survey and experiments since the design is substantially different from most other economic experiments conducted in the field. We then evaluate the pattern of offers by proposers, the degree of correspondence between proposers’ and responders’ choices, and the patterns among responders’ strategies.

³ However, subjects participated in four distinct games that allowed very different kinds of responses, so it may be that the play across the games contributed to the odd patterns of rejection and acceptance.

3.1. Sample structure and recruitment

Our data come from a combination of a survey and laboratory experiments conducted in Tatarstan and Sakha in the summer and fall of 2002. The 2 h, face-to-face survey covered a number of issues ranging from work to social relations and ethnic identification to trust. The questionnaire was developed in English and Russian with collaborators from Demoscope in Moscow, and then translated into Tatar and Yakut. The Tatar and Yakut versions were subsequently blind-backtranslated to insure linguistic equivalence. Wherever possible, respondents were interviewed by same-nationality interviewers, and members of the titular nationality could opt to give the interview in either the titular language or in Russian. The eligible population included non-institutionalized permanent residents eighteen years of age and older.

The stratified, random sample was designed to achieve two goals: to allow comparisons between the titular nationality and Russians in each republic, and to allow inferences about the populations of each republic as a whole. However, comparisons across ethnic groups could be complicated by the fact that the two groups were unevenly distributed, with Tatars and Russians making up around 50 and 43 percent of Tatarstan's population, respectively, and with Yakuts and Russians accounting for approximately 40 and 45 percent in Sakha. The survey thus included an oversample of the underrepresented nationality in each case.

A total of 2572 people were interviewed, 1266 in Tatarstan and 1306 in Sakha. Response rates were 81 and 72 percent, respectively. Ten percent of completed questionnaires were chosen for inspection of interviewers' work by independent evaluators from Moscow, although these inspections were not typically conducted in very small villages.

A unique feature of this research design is that a subset of the survey respondents were re-contacted and then brought together to participate in controlled laboratory experiments a few weeks later. Travel and resource constraints meant that we could only visit a limited number of locations to conduct the experiments. We thus included the capital city and another major city in each republic, some smaller towns, and some villages within a day's driving distance of the cities/towns. We did not, however, go to villages where fewer than 20 individuals had been surveyed.

At the end of the face-to-face interview, interviewers invited all survey respondents in the given locations to participate in the experiments. They then contacted respondents again a short time before the experiments to set a date for them to participate. Respondents who agreed to participate received a 30-ruble fee at that time and then another 120-ruble "showup fee" when they arrived at an experimental session.

A total of 42 experimental sessions (20 in Tatarstan, 22 in Sakha-Yakutia) were conducted in May–July 2002.⁴ An additional five were conducted in Yakutsk 6 weeks later. A total of 650 subjects participated, with 254 from Tatarstan and 396 from Sakha.⁵ Each session lasted

⁴ The final sessions were delayed due to difficulties in locating respondents during mid-summer, when many people were on vacation or away at their dachas.

⁵ Here, however, we exclude 75 subjects from the analysis. Of these, 61 were participants in the experiment who did not fall in the original sample and 14 were in-sample participants in one problematic session. Out-of-sample subjects were typically family members or friends of respondents in the sample who came to play in their stead. Others were participants recruited by interviewers during the final three sessions in order to insure sufficient group

approximately 2 h. Sessions averaged 13.8 subjects (ranging from a low of 7 to a maximum of 23).⁶ The average payoff was 540 rubles in Tatarstan and 558 rubles in Sakha (between US\$ 17.40 and 18.10). These payoffs were substantial by local standards, reflecting a week's wage or more for 62 percent of our subjects. A comparison of sample and experimental respondents is provided in the Appendix A available on the *Journal of Economic Behavior and Organization* website.

3.2. Facilities and set-up

The experimental sessions were usually held in schools or public libraries. Facilities varied a great deal in terms of room size and amenities, but subjects typically sat at tables with sufficient space for their tasks. All were given cardboard boxes to use as “screens” so that their decisions (allocating money and completing forms) could be kept confidential from other participants. To preserve confidentiality, each subject was assigned a number as he or she arrived for the session so that no names would appear on any experimental materials.

While the usual protocol is to run experiments in two different rooms, this was impossible under our field conditions. Thus all subjects were in the same room for all experiments. In part, this was due to the fact that only a single room was available in many of our research sites. It was also due to the fact that we relied on a single local experimenter to conduct all sessions within a republic.⁷ Each experimenter was female and was fluent in both Russian and the titular language. Having two competent experimenters conducting the experiments simultaneously in separate rooms would have been very difficult.

Experimenters ran each session by reading from a standard script in Russian or the titular language, and demonstrated each task physically with the relevant sums of cash, envelopes and forms. In all sessions, experimenters offered a brief explanation of the project and then fielded questions from subjects. Subjects then filled out a 1-page questionnaire on their basic demographic characteristics.

The experiment included eight decision tasks. The first five were variants of the dictator game; the latter three included a trust, an ultimatum and a risk game.⁸ In the first two dictator games, subjects were given 8 ten-ruble notes, 8 pieces of similarly sized blank

size to run each session. All but six of the out-of-sample subjects were subsequently contacted and interviewed. The six non-interviews either could not be located or refused to be interviewed. Finally, respondents in the problematic session were excluded due to possible contamination by two local interviewers.

⁶ As a rule we ran a session only when at least eight subjects were available. When fewer people showed up for a session, we cancelled it and invited them back to a later session. Also, a few subjects were turned away from sessions where the available space was too small to accommodate them and were invited back at a later time.

⁷ In each session one of the authors served as coordinator seated outside the room, organizing the distribution of forms and payouts as the games progressed. The other author served as observer to note questions and issues that arose in the course of the session. A fourth member of the team served as an assistant in handing out/collecting forms and envelopes and answering subjects' questions that arose as they completed various tasks.

⁸ Ideally, the order of the games would have been randomized, but this was impossible to carry out in the field. The experimenters were instructed to stick with the script and they did so. It is very likely that the order of the games affected the behavior of subjects. However, because all subjects faced the same order, any between-subject variation must be due to differences in subject characteristics. Because we have a detailed survey instrument for each subject, we have substantial information about individual characteristics.

paper, and two envelopes. They were then asked to allocate the money and slips of paper between themselves and a counterpart not in the room.⁹ The next two games reversed the procedure. Subjects were given envelopes from other people (again, not in the room) with some sender characteristics listed on the outside. Respondents were then asked to guess how much money the sender had left in the envelope. In the fifth variant of the dictator game, subjects were given two envelopes from other people, each with a picture of the sender on it. Subjects were asked to choose one of the two envelopes and then guess how much money the sender had left in it.¹⁰

The trust game that followed was a standard investment game based on Berg et al. (1995) and details are reported in Bahry et al. (2003). Subjects were divided randomly (by chip draw) into two groups, senders and receivers, and the identity of each group was kept confidential. Senders received 8 ten-ruble notes, eight pieces of blank paper, and an envelope. They were asked to decide how much money to send to their anonymous counterpart, knowing that the experimenters would triple any amount they sent. Receivers would then receive an envelope from an anonymous sender and decide how much of the tripled amount, if any, to put in an envelope for the sender. The envelopes were then handed back to the original senders.¹¹

Once finished with the trust game, subjects played the ultimatum game. The ultimatum game was also standard, except that both proposers and responders were in the same room. In order to insure that no one knew the role to which others were assigned, subjects again drew poker chips from a hat to determine who would be proposers or responders. Proposers were given a form and were asked to choose one of nine possible ways to divide a sum roughly equal to a day's wage (160 rubles in Tatarstan, 240 rubles in Sakha) with an anonymous counterpart in the room. At the same time, responders were given a form with the nine possible allocations and were asked to indicate whether they would accept or reject each one.

As the sheets were collected a research assistant checked to make certain they were completely filled out. Subjects who made "odd" choices in rejections (for example, choosing to reject everything except an equal split) were asked whether that was what they intended and given examples to show what would happen if they were matched with someone making an offer at the extremes. With the exception of two subjects, none changed their mind. The forms were then taken out of the room, where one of the authors randomly matched the subjects and filled envelopes based on the joint decision of each pair.¹²

⁹ In the first treatment they were told their counterpart was someone in the same republic. In the second treatment they were told their counterpart was someone in a different region. In both instances what they allocated was passed on to participants in subsequent sessions.

¹⁰ In each of the latter three dictator games, subjects kept the envelopes sealed until the end of the session. Their responses in subsequent decisions were thus not affected by what they received in these games.

¹¹ To preserve anonymity, while senders were getting money, paper, and envelope, receivers got blank paper and an envelope so that they would be going through the same motions as senders. The steps were reversed in the second stage; senders now got blank paper while receivers got envelopes filled by senders. Senders were not allowed to open the envelopes until the end of the session. Thus receivers learned in the course of the game how much they had earned (based on what they kept) while senders did not.

¹² Many of the sessions included an odd number of subjects. When there was an odd number we used a decision rule making that person an extra responder. A proposer was randomly chosen and matched with two responders. The proposer was paid on the basis of the first responder's choice. Both responders were paid on the basis of their decision given what the proposer offered.

Table 1
Percentage of offers made to recipient by category and republic

Tatarstan		Sakha	
Offer to recipient	Percentage (frequency)	Offer to recipient	Percentage (frequency)
0	0.98 (1)	0	1.85 (3)
20	2.78 (3)	30	4.32 (7)
40	3.70 (4)	60	3.70 (6)
60	22.22 (24)	90	11.11 (18)
80	65.75 (71)	120	70.37 (114)
100	4.63 (5)	150	3.70 (6)
120	0.0 (0)	180	0.62 (1)
140	0.0 (0)	210	1.23 (2)
160	0.0 (0)	240	3.09 (5)
Number	108		162

While the data were being recorded and payments readied, subjects then played a variation of a risk game. Once that game was finished and the envelopes with earnings from the ultimatum game were handed back to subjects, they were debriefed and then told they were free to leave. About half left immediately, while the remainder stayed behind to open their envelopes and count their earnings.

Given the difficult physical conditions under which some of the experiments were performed (especially in remote villages), we think we have gotten close to experiments run in the lab. The difference here was that the lab went into the field.

4. Results

Our focus here is with outcomes from the ultimatum game. We begin by analyzing decisions by proposers. As noted above, the stake was roughly equal to a full day's wage, 160 rubles in Tatarstan and 240 rubles in Sakha. The offers were constrained to nine different allocations, with offers made in 20 ruble increments in Tatarstan and 30 ruble increments in Sakha. On average, proposers offered 47 percent of the total to their counterpart. The bulk of the offers were for an equal split. As seen in Table 1, residents of Tatarstan offered an equal split 66 percent of the time and residents of Sakha 72 percent of the time. This might reflect the fact that Sakha and its residents depend somewhat more on redistribution and on subsidies, given the far harsher natural conditions in Siberia. However, the difference between the republics proves to be only marginally significant.¹³

Table 2 presents results for the matching of proposers and responders. The correspondence between offers and acceptances is high; only 17.4 percent of the offers were "re-

¹³ On average those in Sakha offered slightly more (as a percentage of the pie) with 47.8 percent, compared with 45.4 percent for Tatars. A Mann–Whitney nonparametric test shows that the difference in the distributions is marginally significant ($z = -1.664$, $p = .10$). However, a two-sample median test eliminating ties (which is more appropriate for these data) shows that there is no significant difference between the two republics ($\chi^2(1) = 1.954$, $p = .162$).

Table 2
Rejection rates by offer and republic^a

Tatarstan		Sakha	
Offer to recipient	Percentage rejected (frequency)	Offer to recipient	Percentage rejected (frequency)
0	0.0 (0/0)	0	66.7 (2/3)
20	50.0 (2/4)	30	77.8 (7/9)
40	40.0 (2/5)	60	66.7 (4/6)
60	20.8 (5/24)	90	38.9 (7/18)
80	4.9 (4/81)	120	6.7 (9/134)
100	25.0 (1/4)	150	83.3 (5/6)
120	100.0 (1/1)	180	0.0 (0/1)
140	0.0 (0/0)	210	0.0 (0/2)
160	100.0 (2/2)	240	66.7 (4/6)
Number	121		185

^a Because of an odd number of subjects and because some out-of-sample subjects participated the frequencies in this table do not match those in Table 1.

jected”, and the rejections were not random. Where proposers offered a 50/50 split, only six percent of responders declined the offer. But where proposers offered less than half the stake, a substantial number of the offers were rejected. (In Tatarstan, among the 33 offers below a 50/50 split, 27.3 percent were rejected. In Sakha 20 of 36 offers below 50/50 (55.6 percent) were rejected. A number of more advantageous offers were rejected as well. 13 of 23 offers (56.5 percent) that gave the recipient more than half the amount were rejected.

Compared to ultimatum game experiments run elsewhere, there are several unusual features in these data. First, the offers by proposers are higher than average. Proposers offer an equal split over two-thirds of the time, and the average offer is 47 percent of the total. By comparison the modal offer in the United States is between 40 and 50 percent, and the average offer lies between 30 and 40 percent of the total (see the discussion by Camerer, Chapter 2). Second, there are a number of rejections for hyper-fair offers (i.e., those offering more than half of the sum available). This points to the possibility of unusual responder strategies that help drive equal splits in this experiment.

Table 3 details how responders reacted to each feasible offer. The rejection rate decreases monotonically as the offer goes from 0 to an equal split. Over 94 percent of all 50/50 offers would have been accepted in either Republic. However, the rejection rate then goes up as offers grow more advantageous for the responder. Given this distribution of rejections it is little wonder that proposers overwhelmingly focused on 50/50 offers. Certainly for low offers, proposers had to be cautious, but at the same time proposers could not be guaranteed that hyper-fair offers (those giving the responder more than half) would be accepted. The handful of such offers was rejected more than half the time. By moving to 50/50 offers it is as if proposers have accurate beliefs about responders’ rejection patterns and chose a best response given those beliefs (see Harrison and McCabe, 1996; Eckel and Grossman, 2001).

Responders did not all behave alike, however. Our data reveal three distinct responder profiles. Using a variation of the categories proposed by Huck, we characterize them in

Table 3

The percentage accepting and rejecting hypothetical offers by republic

Tatarstan		Sakha	
Potential offer to recipient	Percentage rejecting (frequency)	Potential offer to recipient	Percentage rejecting (frequency)
0	72.2	0	77.3
20	56.2	30	68.7
40	44.6	60	54.1
60	28.9	90	37.8
80	3.3	120	6.0
100	28.9	150	33.0
120	36.4	180	41.6
140	40.0	210	48.1
160	45.5	240	50.3
Number	121		185

Table 4

The percentage and number (*N*) of subjects with a specific profile, by republic

Type	Tatarstan	Sakha
Monotonically rational (M-R)	50.0 (61)	38.3 (79)
Hyper-fair (H-F)	42.6 (52)	40.8 (84)
Confused (C)	7.4 (9)	20.9 (43)

Fig. 1a–c.¹⁴ The first pattern, given by Fig. 1a, is a standard monotonically rational pattern. Here subjects hold a consistent ordering in their rejections. As offers increase, at some point they switch from rejecting to accepting offers. The second pattern, represented by Fig. 1b, has an inverted “U” shape in which both low and high offers are rejected. We think such subjects have a very distinct concept of fairness in which hyper-fair offers are unacceptable. Certainly this would fit with the egalitarianism of the Soviet period. The third pattern, in Fig. 1c, indicates subjects who appear to be confused. They change their mind several times, rejecting offers in a seemingly random pattern.

Responders who began with rejecting a low offer (or offers) and then switched to accepting all subsequent offers were coded as monotonically rational (M-R). This includes the special case of subjects who accepted all offers (17.1 percent of the responders). Responders who rejected offers on both the left and right of the equal split are coded as hyper-fair (H-R). Finally, subjects who “bounced” between accepting and rejecting offers are coded as confused. This group includes any subject who accepted an offer, rejected a higher one, and then accepted one still higher.

As Table 4 indicates, over 75 percent of subjects played either an M-R or an H-F strategy (and of those using an H-F strategy, 55 of 136 chose to accept *only* the

¹⁴ Huck develops three basic profiles. One is strict monotonic rationality and accounts for just under 40 percent of the subjects. A second is what Huck calls “weak local monotonicity”, in which subjects accept a connected set of allocations including at least an equal split or an offer of everything. (This includes people who might accept offers around the equal split but at the same time reject low and high offers.) These subjects account for another 30 percent of his subjects. Finally, there is roughly 30 percent for whom the patterns make no obvious sense.

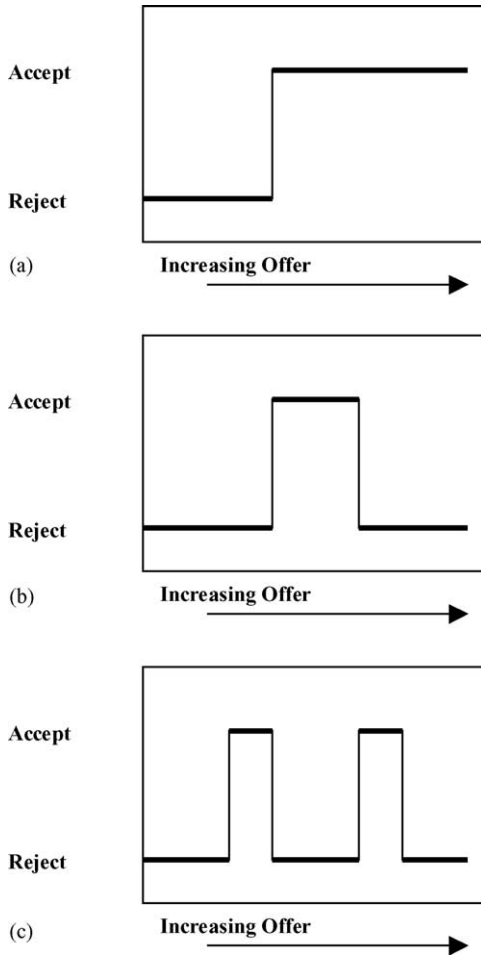


Fig. 1. (a) Hypothetical pattern of rejecting and accepting for (a) a monotonically rational (M-R) subject; (b) a hyper-fair (H-F) subject; (c) a confused (C) subject.

equal split). About 15 percent were confused, a profile more common in Sakha than in Tatarstan.¹⁵

What factors shape the choice of one strategy over another? We began the analysis expecting that several variables would distinguish between people committed to a Soviet-style norm of hyper-fairness and a market-oriented norm of monotonic rationality. One conjecture is that individuals differ by age: older respondents, socialized in the Soviet era,

¹⁵ We examined the distribution of strategies within each session as well to determine whether there was something about individual sessions that might have produced more confused respondents, but all three strategy profiles crop up in every session, suggesting that it was not the conduct of the session itself that influenced the choice of strategy. As we note below, choice of a confused strategy depended more on individual characteristics of the participants.

ought to be more disposed to the old norms, while younger ones should be disposed to more self-regarding norms. Norms might also vary between urban and rural areas, especially given the slower penetration of the market in villages than in cities (cf. Gächter and Benedickt, 2003; Wegren, 2002; Wegren et al., 2003). Third, ethnicity might make a difference, since market reform has been slower in non-Russian areas (Slider, 1997; Bahry, 2002). On the other hand, earlier survey evidence suggests that titular ethnic groups and Russians in Tatarstan and Sakha have fared about the same in their experiences of economic transition (Bahry, 2002). Thus fairness norms might not be all that different across our key ethnic groups. Fourth, socio-economic status might be a factor. We would expect that people advantaged in the market transition (with higher incomes) ought to be more disposed to market-type norms while low-income subjects would be less so. Finally, we think that the choice of strategy might also depend on an individual's subjective commitment to equality.

We use an unordered multinomial logit to test these hypotheses. The baseline category is set as the H-F strategy. To tap generational differences, we use subjects' age (with a range of 18–82 and a mean of 42). In the course of the analysis, we discovered that the effect might not be monotonic, so we also include age squared to test for a potential curvilinear relationship. The urban–rural divide is measured with a dummy variable for villages (coded as places with fewer than 3000 people). Our measure of ethnicity is a respondent's self-defined ethnic identity, represented here as a dummy variable (1 if Russian; 0 if titular or other). (The percentage of Russians in the experiment is 37.7, another 23.1 percent were Tatar, and 31.6 percent were Yakut.) To assess egalitarianism, we use an additive scale of two agree–disagree questions: “everyone deserves a normal standard of living regardless of how well they work” and “it is only natural for some people to live better than others.” (The items were coded in the same direction and added together.) The resulting scale ranges from 2 to 8 in which a higher score constitutes a stronger egalitarian outlook (the modal response was 4 and the mean was 4.7). To measure socio-economic status, we include logged monthly household income.¹⁶ Finally a dummy variable is included for experiments conducted in Sakha to capture differences across the two republics.¹⁷

The results are presented in Table 5. The first column estimates the likelihood of choosing a monotonically rational strategy instead of a hyper-fair strategy (the comparison group). Several of our expectations are borne out; monotonic rationality is the province of the young and relatively well-to-do. It is significantly less common among people with a subjective commitment to egalitarianism. Ethnicity, however, has little impact on choice of strategy. Russians and non-Russians are equally likely to be monotonically rational. We do, though, find a significant regional effect once other variables are factored in. Residents of Sakha

¹⁶ In the survey respondents were asked their household income. Among the subjects in this analysis, there were 64 with missing data for this variable. However, these respondents did reply to another question on their personal income. We used that to estimate their household income, adjusted for the size of the household. In addition, because of differences in cost of living between Tatarstan and Sakha, household income was adjusted accordingly so that comparisons can be directly made across Republics.

¹⁷ We also ran numerous other models testing the robustness of the variables reported here. The most complete model included the sex of the subject, an attitudinal scale measuring commitment to private ownership, and strength of religious beliefs along with the variables listed in Table 5. None of these other coefficients proved statistically significant. A likelihood ratio test between a model including these variables, and the model reported in Table 5 indicates they contribute little to the estimates ($\chi^2(8) = 3.58, p = .82$), so they were dropped.

Table 5

Estimate of a subject's rejection strategy with unordered multinomial logit^a

	M-R strategy	C strategy
Intercept	.419 (1.887)	1.945 (1.872)
Age	–.101 ⁺ (.057)	–.168* (.072)
Age-squared	.0008 (.006)	.002** (.0008)
Village (0 = no, 1 = yes)	1.025** (.390)	1.409** (.474)
Egalitarianism	–.198* (.105)	–.089 (.132)
Sakha (0 = no, 1 = yes)	–.564* (.301)	.826 ⁺ (.450)
Russian (0 = no, 1 = yes)	–.245 (.322)	–.577 (.472)
Household income (logged, monthly)	.409** (.161)	.009 (.115)

Log-likelihood = –255.89; $N = 276$; Pseudo- $r^2 = .10$.

^a A hyper-fair strategy is the comparison group and standard errors are in parentheses. Bolded coefficients are significant at the .10 level or above.

⁺ <.01.

* <.05.

** <.10.

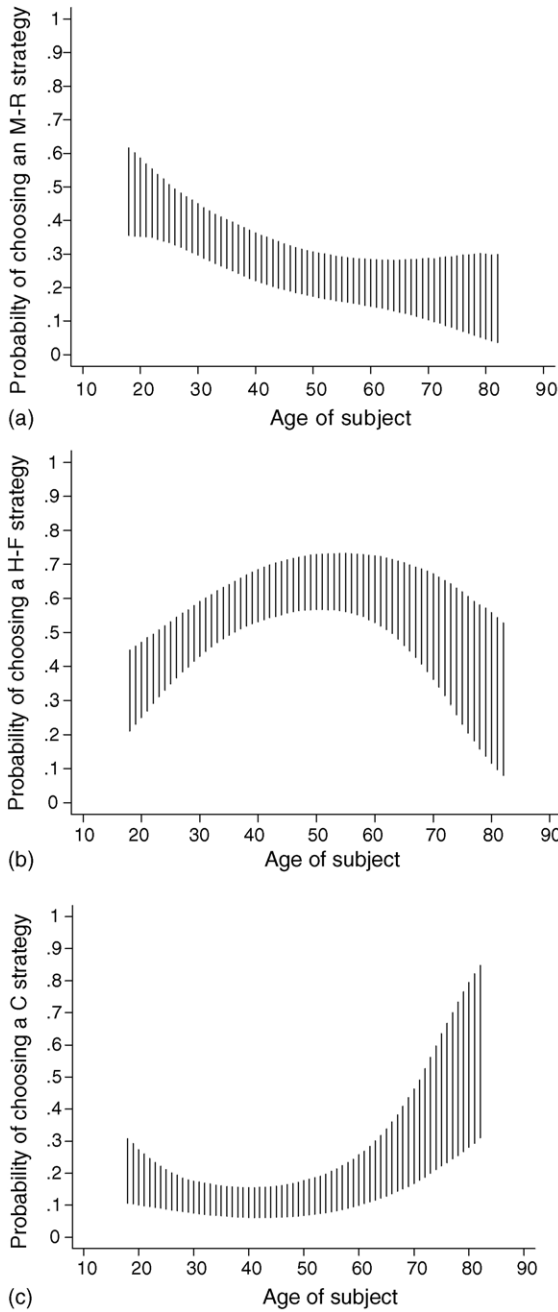
are more disposed to hyper-fairness. As noted earlier, this may be due to greater reliance on redistributive policies to cope with the harsh climate and terrain.

Other results in column 1 of Table 5 diverge from what we would expect. Thus despite the slower penetration of market mechanisms into rural areas, villagers are more likely to choose monotonically rational strategies than their urban counterparts. Given the small sample size, it is difficult to disaggregate the data further to tease out why this might be the case.

The second column in Table 5 estimates the likelihood of choosing a confused strategy rather than a hyper-fair strategy. Once again, age matters; younger and older subjects are more likely to play a confused rather than hyper-fair strategy (both the age and age-squared coefficients are significant and indicate an inverted quadratic relationship). Villagers are also more likely to play confused than are urban dwellers. Finally there is a significant difference between the regions, with those in Sakha more likely to resort to this strategy than a hyper-fair strategy. Neither household income nor egalitarianism has any effect in this case.

Directly comparing the correlates of these different strategies is difficult to do from Table 5. To make the comparisons easier, the parameters of the model were simulated and converted to predicted values. The 90 percent confidence intervals were then plotted for each age category in the sample. Predictions were made for each strategy, setting the variables egalitarianism and household income at their mean and switching on the dummy variables for Sakha.¹⁸ The three plots in Fig. 2 give the probabilities of choosing the particular strategy, contingent on the model estimated in Table 5. Several points stand out. First there is a clear age effect for all the strategies, though the estimates for the oldest cohort are noisier than they are for the young. The youngest subjects are more likely to use a monotonically rational rejection profile than their elders. The middle-aged cohort (in their 40s and 50s) are more

¹⁸ The simulations and predicted values were generated in STATA using Clarify. Additional detail concerning the Clarify procedure is given in King et al. (2000).



* Predicted values are derived from simulations from Table 5. The bars at each age reflect the 90 percent confidence interval.

Fig. 2. Probability of choosing (a) monotonic rationality; (b) hyperfairness; (c) a confused strategy, by age (predicted values are derived from simulations from Table 5. The bars at each age reflect the 90 percent confidence interval).

likely to use a hyper-fair strategy and the oldest subjects (and some of the youngest as well) are more disposed to follow a confused strategy.

5. Discussion

These results lead to a number of observations.

- *Observation 1:* Although our object here was not to test the robustness of the ultimatum game in a non-American environment, our results nevertheless confirm it. As in other ultimatum game research, we found that proposers tend toward equal splits, and responders tend to accept them. On the proposer side, our offers are at the upper range of those reported by Roth. These results also fit well with societies that are “marketized” as reported in Henrich. The offers fit closely with those reported by Cameron in the high-stakes condition. Likewise, the rates of rejections are in line with many of these studies.
- *Observation 2:* Unlike most other experiments using the ultimatum game, however, we find systematic variation in responder strategies. A significant number of subjects do play monotonically rational, as in other experiments, but an almost equal number take a very different approach to fairness. Thus the pattern we find is not simply one of monotonic rationality and deviations from it, but rather one of different norms operating for different groups of respondents.
- *Observation 3:* We also find that the choice of strategy is not random. Subjects differ significantly by age, by place of residence, and by income. Monotonically rational norms that fit more readily with market transition are most evident among the young and those with higher incomes. Hyper-fair norms are the province of the poor and the middle-aged. They are also the province of people with a subjective commitment to equality.
- *Observation 4:* These patterns of play among responders also help to explain why the number of proposers offering equal splits should be so high. A proposal for a 50/50 split was clearly a best response. We think that the offer side tells us a great deal about expectations (see the discussion by Harrison and McCabe). Proposers understood the social norm of fairness. This is evident in that young and old alike (the subjects least disposed to hyper-fairness as responders) nevertheless made equal offers and behaved as if they anticipated being paired with middle-aged counterparts who prefer egalitarian splits. Such a response is consistent with evolutionary game theoretic models that anticipate fair strategies surviving if proposers have strong beliefs about responders’ expectations of fairness (see for example Ellingsen and Robles, 2002).

6. Conclusion

We began this paper by noting that research in experimental economics has only recently begun to address the issue of heterogeneity in samples and in economic behavior. Our research addresses the question of heterogeneity by focusing on a cross-section of the population in two republics of Russia.

In one sense, the results are very similar to those from most other research on ultimatum games. The modal choice for an offer was an equal split of the pie. Almost all offers were accepted. What is surprising, however, is that the proportion of equal offers is unusually high. Almost two-thirds of subjects in Tatarstan and almost three-quarters of those in Sakha make such offers. A closer look at the patterns of rejection under the strategy method makes the high proportion of 50/50 splits less surprising. A sizeable number of people in both republics choose what we have called hyper-fair strategies, rejecting both low and high offers. In this sense they appear to have a strong commitment to a norm of fairness defined as an equal split of the pie.

We think that this norm is a residual from the Soviet era for a certain segment of the population, but its impact seems to extend beyond that segment, by leading other people to egalitarian behavior as well.

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Appendix A. Sample design

The sample design began with two strata: urban and rural, using data from the most recent census updates. Urban areas were then further stratified by size and drawn randomly with probability proportional to size. Each urban area in the sample was then partitioned into districts, and districts were randomly selected for inclusion in the sample. Within each sample district, a list of all dwellings was constructed by visual inspection and consultation with authorities. In the case of dormitories and communal apartments, each room or space housing a separate household was treated as a dwelling unit, not the entire building. Then, a number of dwelling units were selected systematically starting with a random number. An individual from each drawn household was then selected using the Kish procedure (Kish, 1965). Sampling in rural areas presented more problems. Cost considerations and lack of detailed data made it impossible to build a sample from the ground up based on all rural settlements or to conduct only a few interviews apiece in widely dispersed settlements. As an alternative, villages were drawn from the raions (regions) included in the urban stratum. However, many villages in the two republics are ethnically homogeneous, and since only a few villages could be selected from most raions, we wanted to avoid the problem of disproportionate representation of one or the other major ethnic groups. As a result, within each selected raion, villages were stratified by ethnic composition: predominantly (90 percent or more) titular, predominantly (90 percent or more) Russian, and mixed. Within each of these strata, villages with at least 100 residents were ordered by size and selected by probability proportional to size. Within each village, households were selected systemat-

Table A1

Major demographic comparisons between the survey respondents and subjects who were surveyed and participated in the experiment

Variable	Survey only	Survey and experiment	Difference?
Age (mean)	46.10	41.91	Yes ^a
College educated (percent)	15.70	22.45	Yes ^b
Sex (percent female)	59.44	65.99	Yes ^b
Household income in rubles (mean)	5126.05	5491.02	No ^a
Always lived in the republic (percent)	71.99	75.00	No ^b
Russian national	51.30	39.19	Yes ^b
From a village (under 3000 people—percent)	36.68	28.42	Yes ^b

^a Test was whether $p < .05$ using t -test of difference of means.

^b Test was whether $p < .05$ using Wilcoxon signed ranks test.

ically starting from a random number and drawn from the official residence registration book (pokhoziaistvennaia kniga). The Kish procedure was employed to select an individual respondent from each drawn household. As in urban areas, at no point did interviewers exercise discretion in the selection of households or respondents.

Geography and budgetary considerations imposed some limitations on the sample design. Remote areas of Sakha were eliminated since many points were sparsely settled and not regularly accessible by scheduled transportation. Such exclusions are common in national surveys employing face-to-face interviews; certain territories are eliminated in advance due to practical considerations such as very low population density, low accessibility, or political unrest. (Thus in the US, Alaska and Hawaii are typically excluded from national samples.)

As shown in Table A1 there are some differences between the respondents from the survey and those who participated in both the survey and the experiment. Subjects in the experiment were younger and better educated than the sample from the survey. As well, subjects in the experiment were more likely to be female. The high percentage of females responding to the survey is not unusual in most surveys in Russia. This has to do with a combination of mortality rates among men, especially in the older population, and with the mobility of males pursuing secondary forms of employment. The distribution of household income was very similar for both groups. However, people in the experiment were more likely to be white-collar workers, students and housewives. In part this was because these individuals could get away to attend the experiment.¹⁹

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¹⁹ We tried to make certain that people who were working could attend. The experiments were usually conducted at 6 p.m., after work, or on weekends. Subjects were given a choice of attending sessions at different times, and we tried very hard to accommodate their needs and preferences.

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