FOLIA 202

Annales Universitatis Paedagogicae Cracoviensis

Studia Sociologica VIII (2016), vol. 1, p. 143–165
ISSN 2081–6642

Szymon Czarnik
Jagiellonian University, Poland

Reading Minds of Experimental Subjects. Insights from Pre- and Post-Experimental Surveys in a Redistribution Game Experiment[1]

Abstract

Subjects' responses in pre- and post-experimental questionnaires are utilized to elucidate their behaviour in an asymmetric Prisoner's Dilemma redistribution game with no communication between players. We find experimental subjects to be predominantly negative in their assessment of intentions behind their partners' decisions while describing their own motivations as rationally self-interested, reciprocal, and efficiency-oriented. Thus, in the absence of communication, negative intent attribution may be one of the crucial reasons behind failure to establish lasting cooperation, even in situations where both players are well aware of its benefits and the behaviour necessary to achieve it. We also find some evidence that, on average, players conscious of Pareto-optimizing potential brought about by mutual adoption of Tit-for-Tat strategies make more friendly decisions in the game. Lastly, we consider the study's ecological validity in the light of subjects' post-experimental statements.

Key words: behavioural game theory, Prisoner's Dilemma, tax redistribution, cooperation, interpretation of intentions

The experiment

In May 2005, I conducted an experimental study to investigate redistributive behaviour in a situation where unequal incomes, subject to subsequent redistribution, were rightfully earned by participants (rather than allotted randomly or on the basis of some kind of disputable criterion like a score in a quiz).

A few days before the experiment proper, all subjects attended a single group meeting with the researcher. Apart from introducing everyone to the basic framework of the experiment, the meeting provided an opportunity to collect some relevant additional data. Subjects filled in a questionnaire containing a number of items related to real-life redistribution themes. They made a series of monetary choices wherewith their aversion to payoff inequality was measured. They were put in a position to reveal ('behind the veil of ignorance') their beliefs about what constituted a fair initial payoff distribution in the experiment. Finally, they had to

[1] The research on which this paper is based was financed by the Polish Ministry of Education and Science as part of the project 1 H02E 046 28.

do the hard work to earn money to be subsequently used in redistribution games. The job to be done was deciphering either one, or two, or four pages of coded text, with 15 PLN paid per page. Thus 72 subjects, 36 male and 36 female, were randomly divided into three 12 person male groups and three 12 person female groups with income levels of 15, 30, and 60 PLN, respectively. Twelve experimental sessions (six all-male and six all-female) were scheduled, with two persons from each income level taking part in any single session. Within each session twelve-round redistribution games were to be played between subjects of unequal initial payoffs, i.e. 15–30, 30–60, or 15–60 PLN.

Directly before playing experimental games subjects watched a graphical presentation explaining the mechanism of tax redistribution and the rules of the game in an intuitive way. It is important to stress that terms like 'game,' 'players,' 'strategy,' etc. were never used in communication with the subjects. The whole research situation was explicitly described as an investigation of real-life monetary decisions affecting both one's own and someone else's earned money.

The redistribution mechanism

Redistribution mechanism used in the game may be thought of as an implementation of a negative income tax (NIT) proposed by Milton Friedman back in the 1960s (Friedman 2002). The basic idea is that taxes would be paid only by people with incomes above a certain threshold value, while those below the threshold would pay a 'negative tax,' i.e. receive a subsidy from the budget. The amount of tax paid (subsidy received) would in turn depend on how much person's income exceeds (falls short of) the threshold (with those at the threshold breaking even).[2]

An implementation proposed here would operate in three steps:

1. Everyone pays a linear income tax on his or her initial income.
2. Part of total tax revenues is 'lost,' i.e. taken away to cover the cost of tax collecting and redistribution.
3. What remains in the budget is divided equally among all persons in a form of lump-sum subsidies.

To analyse the logic of this redistribution mechanism, let us denote person's *i* initial payoff by p_i, a linear tax rate by T and a fiscal cost, or share of revenues lost in the process, by C. Then each person's final income, i.e. income after paying a tax and receiving a subsidy, may be construed as consisting of two parts:

$$p'_i = (1 - T)p_i + (1 - C)T\bar{p}$$

[2] A rationale behind NIT was to help low-income workers in a way that would minimize distortions in the market. As Friedman put it, 'Like any other measures to alleviate poverty, it reduces the incentives of those helped to help themselves, but it does not eliminate that incentive entirely' (p. 192). However, the idea met with severe criticism from the word go (see, e.g. *Fallacies of the Negative Income Tax* in Henry Hazlitt's *Man vs. the Welfare State*, 1969).

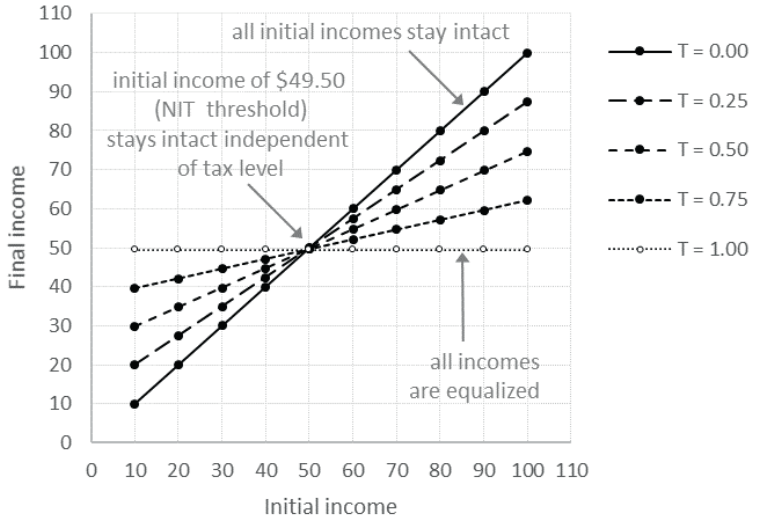
$(1- T)p_i$ is a part that depends on person's *i* initial income. To be exact, it is a part of the person's initial income that is kept after paying a linear tax. $T(1 - C)\bar{p}$ is a lump-sum subsidy from the budget, which is the same for all persons. Obviously, it does not depend on individual initial income but instead it depends on $\bar{p}$, the average initial income in the population.[3] With T equal to 0, all persons would stay with their initial incomes, and with T equal to 1 all incomes would be equalized at the level of $(1 - C)\bar{p}$.

The effective amount of tax paid by player *i* is a difference between his initial income and his final income, or alternatively a difference between the amount paid by him in the form of a linear tax, Tp_i, and the lump-sum subsidy received from the budget, $(1 - C)T\bar{p}$:

$$\tau_i = p_i - p'_i = Tp_i - (1 - C)T\bar{p}$$

A straightforward calculation shows that tax redistribution benefits a person, namely $p'_i > p_i$ (which is tantamount to $\tau_i < 0$), if and only if $p_i < (1 - C)\bar{p}$. $(1 - C)T\bar{p}$ is then a threshold value of negative income tax.[4] At the same time, the amount lost in the process of tax redistribution, which we shall henceforth call a *net social loss*, is $\lambda = CT\sum p_i$.

Figure 1. Tax redistribution at different tax levels and fiscal cost 10%



[3] Tax revenues available for redistribution are equal to $(1 - C)\sum Tp_i$. As they are divided evenly among all persons, a lump-sum subsidy may be expressed as $(1 - C)\sum Tp_i/n$, or $T(1 - C)\bar{p}$.

[4] It may be noted in the passing that with sufficiently large fiscal cost *C* only few persons, or even nobody at all, would benefit from tax redistribution. With *C* equal to 1, all tax revenues would be lost and no subsidies sent back.

By means of an example, Figure 1 shows how redistribution at various tax levels (and at fixed 10% fiscal cost) would affect initial incomes of ten persons, earning \$10, \$20, \$30, ..., \$100, respectively. Average initial income in the group is \$55, and break-even NIT threshold is \$49.50 (0.9 times \$55).

The experimental redistribution game

In the experiment, dyads formed by persons of unequal initial payoffs were playing a redistribution game with NIT mechanism described previously. Three combinations of initial payoffs were possible: 15 PLN vs. 60 PLN, 15 PLN vs. 30 PLN, and 30 PLN vs. 60 PLN. In each round of the game, both a high- and a low-earner (henceforth denoted by H and L, respectively) had to make two choices. First, they had to cast a secret vote on the preferred level of linear tax redistribution, with 0% tax leaving the initial payoffs intact and 100% tax making both payoffs equal. The votes were then revealed and effective tax level was set to the average of the two proposals, $T = (t_L + t_H)/2$. After incomes had been redistributed accordingly, players had an opportunity to make free gifts to one another. The crucial element of the game was that voluntary transfers were fully efficient, whereas tax transfers involved a fiscal cost leading to either 10 or 30% of 'tax revenue' leaked in the process.

In all experimental games, L's initial payoff was below NIT threshold and therefore L was in a position to gain from tax redistribution at the expense of H.[5] Namely, low earners were effectively paying a negative tax in the amount of $\tau_L < 0$, whereas high earners were effectively paying a positive income tax in the amount of $\tau_H > 0$.[6] As a matter of fact, τ_H was necessarily utilized both to subsidize L and cover the inherent net social loss, $\tau_H = |\tau_L| + \lambda$.

Charts in Figure 2 show the outcomes of tax redistribution for each type of dyad with tax level T at 50% (being the result of L voting maximum 100% tax, and H voting no tax at all), and fiscal cost either 10, or 30%. Naturally, with no redistributive taxation (T=0), players would stay with their initial payoffs, no matter the fiscal cost.

Finally, after NIT mechanism had been put into effect, players could offer free monetary gifts to one another and thus their final incomes were $p''_i = p'_i - g_i + g_j$, where g_i and g_j are voluntary gifts offered by players i and j respectively.

Now we should recognize that the structure of the experimental redistribution game is essentially that of a *repeated sequential asymmetric continuous-strategy Prisoner's Dilemma*. Cooperative decisions in the game consist in L voting first for low or no taxes, and then H offering him a sufficiently high voluntary gift. By virtue of such cooperation, net social loss can be minimized, or even eliminated. Thus,

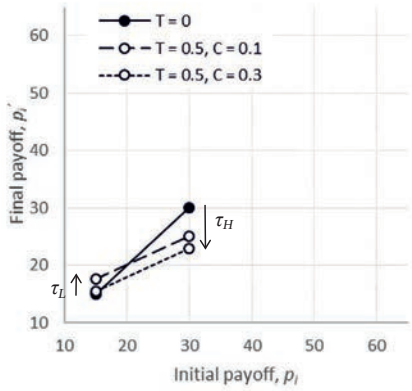
[5] With L's payoff underlined, NIT thresholds for 15–30 PLN dyad are 20.25 (fiscal cost 10%) and 15.75 (30%); for 15–60 PLN they are 33.75 (10%) and 26.25 (30%), and for 30–60 PLN they are 40.50 (10%) and 31.50 (30%).

[6] The exact amount is given, as in the general case, by $\tau_i = Tp_i - (1-C)T\bar{p}$, with $\bar{p} = (p_L + p_H)/2$.

as characteristic of Prisoner's Dilemma, it is in the best interest of both parties to enter into mutually beneficial cooperation by substituting costly tax redistribution with efficient voluntary redistribution. This, however, is not a trivial exercise, as it requires L to renounce his tax benefits, and H to give up a portion of his rightfully earned incomes.[7] In effect, under standard assumptions of rational egoism, the unique equilibrium outcome in a single round of this game is 50% tax redistribution with no voluntary redistribution at all. This is brought about by L voting for maximum tax ($t_L = 1$) and offering no gift ($g_L = 0$), and H voting for minimum tax ($t_H = 0$) and offering no gift either ($g_H = 0$). The equilibrium is clearly Pareto suboptimal due to net social loss λ inherent in tax redistribution.

Figure 2. Tax redistribution in the experimental dyads

15 PLN vs. 30 PLN



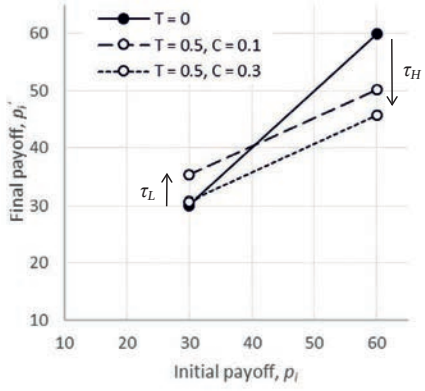
$\tau_i = p_i - p_i'$

High-earner pays a positive tax in the amount of $\tau_H > 0$

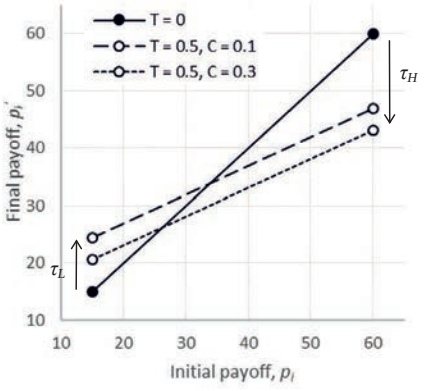
Low-earner pays a negative tax in the amount of $\tau_L < 0$ (receives a net subsidy)

$\lambda = \tau_H - |\tau_L|$
The difference between amount paid by H and amount received by L is a net social loss, λ.

30 PLN vs. 60 PLN



15 PLN vs. 60 PLN



[7] Remember that initial incomes were directly proportional to the amount of work done at the pre-experimental meeting. This created a strong sense of entitlement as most subjects ('behind the veil of ignorance') considered proportional compensation to be a fair allocation rule.

All experimental encounters between low- and high-earners consisted of 12 rounds of thus defined redistribution game. Since the total number of rounds was common knowledge, by means of backward induction the dismal high-taxes no-charity status quo was the unique equilibrium of the whole 12-round game as well.[8] Players' equilibrium gains and losses in 6 experimental types of games are juxtaposed in Table 1 (graphically, these results were presented in Figure 2).

Table 1. Theoretical equilibrium outcomes of experimental redistribution games

Dyad types (p_L–p_H)	15–30 PLN		30–60 PLN		15–60 PLN	
Fiscal cost (C)	10%	30%	10%	30%	10%	30%
L's final payoff (p''_L)	17.63	15.38	35.25	30.75	24.38	20.63
H's final payoff (p''_H)	25.12	22.87	50.25	45.75	46.87	43.12
L's gain ($\lvert\tau_L\rvert$)	2.63	0.38	5.25	0.75	9.38	5.63
H's loss ($\tau_H = \lvert\tau_L\rvert+\lambda$)	4.88	7.13	9.75	14.25	13.13	16.88
Net social loss (λ)	2.25	6.75	4.50	13.50	3.75	11.25
Efficiency of tax transfer ($\lvert\tau_L\rvert/\tau_H$)	54%	5%	54%	5%	71%	33%

In the experiment proper, a member of any payoff category X played first a doubleheader against a member of Y category (one game at 10%, the other at 30% fiscal cost), and then proceeded to a doubleheader with a partner from Z category.[9] For instance, one possible path for a 15 PLN earner was to play games in the following order:

15–30 PLN (cost 10%) → 15–30 PLN (cost 30%) → 15–60 PLN (cost 10%) → 15–60 PLN (cost 30%)

Main experimental results

Table 2 lists main results from actual experimental redistribution games. These were succinctly commented by the author in his earlier paper (Czarnik 2006), while a detailed analysis is to be found in his PhD thesis (Czarnik 2007).

[8] To be sure, this is characteristic of all finitely-repeated versions of the classic prisoners' dilemma. As Kreps et al. put it back in 1982, 'This game has a unique Nash equilibrium path, which involves each player choosing to fink at every stage… This outcome is clearly and dramatically inefficient.' Then they go on to contrast this with actual empirical evidence of human subjects' behaviour: 'This uniqueness result is disturbing in light of experiments with this game, of which there have been a very large number… A common pattern in these experiments is that, at least for some time, both players cooperate and, in the process, end up with payoffs that are strictly greater than they would obtain under equilibrium play.' (Kreps et al. 1982, p. 2).

[9] Doubleheaders were played within fixed-pairs. However, subjects had not been informed that they played two consecutive games against the same person. As revealed in a post-experimental survey, most of them actually believed they were matched with a new person each time.

Table 2. Main results from experimental redistribution games

Dyad types (p_L–p_H)	15–30 PLN		30–60 PLN		15–60 PLN	
Fiscal cost (C)	10%	30%	10%	30%	10%	30%
L's mean tax vote (t_L, %)	56.73	40.92	58.82	53.99	78.55	74.79
H's mean tax vote (t_H,%)	1.33	2.22	1.77	1.79	4.43	5.12
L's final payoff (p''_L, PLN)	16.90	15.80	35.36	32.76	23.14	19.80
H's final payoff (p''_H, PLN)	26.80	26.29	51.91	49.72	48.76	46.21
H's mean gift (g_L, PLN)	0.38	0.64	2.18	2.34	0.35	0.30
Mean social loss (λ, PLN)	1.30	2.91	2.73	7.52	3.10	8.99
Number of games	12	11*	12	12	11*	12

*One game was lost due to technical problems

Briefly, the results can be summarized as follows:

1. Subjects' behaviour deviated substantially from equilibrium play. Nonetheless, for the most part their decisions were narrowly self-interested and far from reaching Pareto-optimal cooperation. Moreover, most of low-earners' self-serving tax decisions were in direct violation of their fairness judgments, as elicited in the pre-experimental procedure under the Rawlsian 'veil of ignorance'.[10]
2. Tax-imposed redistribution was most severe where initial income disparity was the largest, namely in 15–60 PLN dyads.
3. Increased inefficiency of tax redistribution (30% versus 10% fiscal cost) had next to no effect in games involving the highest earners (60 PLN). Only in 15–30 PLN games larger fiscal cost induced somewhat more restrained tax voting.
4. Except for 15–60 PLN games, in majority of rounds voluntary donations tended to be crowded out by fiscal redistribution. This crowding-out effect was evidenced by statistically significant negative correlation between the level of Ls' tax votes and the amount of Hs' free gifts.

   Results 1–4 refer to the data from the first two games played within fixed pairs, one under 10% and the other under 30% tax cost. After these two games subjects were matched again to play a doubleheader with another person. Players involved in 15–30 PLN games were matched against 60 PLN, those involved in 30–60 PLN games were matched against 15 PLN, and those in 15–60 PLN games against 30 PLN.
5. In second-partner games, a powerful history effect was revealed. The relationship between income inequality and amount of tax redistribution (see point 2 above) was completely reversed. 15 PLN earners who experienced a large income disparity in their first doubleheaders against 60 PLN and acquired a taste for heavy tax redistribution, had no qualms about voting high taxes in their

[10] For more details, see Czarnik 2009.

subsequent encounters against 30 PLN. On the other hand, those 15 PLN earners who practiced moderate tax voting in their first doubleheaders against 30 PLN, just went on with their moderate approach in subsequent games against 60 PLN.

Insights from pre- and post-experimental surveys

Pre-experimental survey included questions about causes behind wealth and poverty, income redistribution by government, relations between the rich and the poor, as well as some personal data (sex, academic major, year of studies, financial situation). The post-experimental survey consisted of six open-ended questions:

1. All in all, are you satisfied to have taken part in the experiment?
2. Did you know personally any person co-participating in your experimental session?
3. Do you think you were matched with the same person twice?
4. Please, summarize shortly the behaviour of persons you were matched with.
5. What were your concerns when making decisions about tax level and amount of free transfer to the other person?
6. If you could communicate with the other person to establish a common way of conduct, what would you propose?

Satisfaction was universal among experimental subjects, with only two out of seventy-two participants responding ambiguously. Eighteen subjects had known personally someone who participated in their experimental session, but only three of them thought they had been matched with that person. Nearly half of the experimental subjects thought they had been paired with a different partner each time. Thus, we may consider experimental instruction to be successful in dissuading subjects from treating two consecutive games as one meta-game. If pairs were drawn randomly, the probability of being matched with a different person each time would be only 25%, and yet nearly each second subject thought this had been the case.

Questions 3 to 5 provide much more substantial information as they allow us an insight into how experimental subjects interpreted their own and their partners' behaviour.

Intentions attributed to other parties

Each subject's description of other people's behaviours was dissected into distinct themes and categorized according to the same coding scheme. Some respondents were quite laconic while others had their statements categorized into as many as four different groups. Those detailed categories were in turn collapsed into three major groups depending on the effect other people's actions had on the respondent:

- *positive*, i.e. suggesting other party's friendly attitude or readiness to cooperate;
- *negative*, i.e. suggesting other party's hostile intent, disregard for cooperation, or erratic behaviour;

- *neutral*, i.e. neither beneficial not detrimental per se, mainly referring to rational pursuit of other party's own interest.

It should be noted that subjects were making a single statement concerning all their partners. For this reason, it is not surprising that some statements included what would otherwise seem contradictory opinions, i.e. both positive and negative.[11]

Table 3 contains the frequencies of persons subscribing to particular themes, separately for subjects with initial earnings of 15, 30, and 60 PLN.

Table 3. Interpretations of motives behind partners' behaviour provided by 15, 30, and 60 PLN earners*

–	negative	16
·	neutral	8
+	positive	6

–	negative	16
·	neutral	10
+	positive	8

–	negative	16
·	neutral	7
+	positive	9

	15 PLN earners (n=22)	**N**
–	stinginess of high-earners	11
·	reciprocation	6
+	(positive)	3
–	(negative)	3
·	own interest	4
–	lack of rationality	4
+	generosity of high-earners	3
–	lack of reciprocation	3
·	rationality	2
·	minimization of own losses	1
–	chaos	1
·	(it depends)	1

	30 PLN earners (n=23)	**N**
–	covetousness of low-earners	11
+	reciprocation (positive)	6
–	lack of reciprocation	6
·	(it depends)	5
–	stinginess of high-earners	4
–	lack of rationality	4
·	rationality	3
–	inefficiency	3
·	minimization of own losses	2
·	own interest	1
+	generosity of high-earners	1
+	restraint of low-earners	1
·	superficial lack of rationality	1
·	caution	1
+	group efficiency	1
·	income equalization	1

	60 PLN earners (n=24)	**N**
–	covetousness of low-earners	11
·	reciprocation	8
+	(positive)	6
–	(negative)	2
–	lack of rationality	7
·	(it depends)	3
·	own interest	2
–	inefficiency	2
+	restraint of low-earners	2
+	generosity of low-earners	1
·	rationality	1
·	minimization of own losses	1
–	lack of reciprocation	1
·	caution	1

* Multiple categories possible. Last column in each table displays numbers of persons whose comments fitted particular categories.

First thing to notice is the prevalence of negative sentiments in all earning groups.[12] In the 15 PLN group, the main complaint was about the 'richer' subjects unwilling to share (*'Generally, persons who had most money were more stingy'*). On the other hand, a typical comment from a 60 PLN earner complained that *'most*

[11] For example, one 60 PLN earner's description of his partners found its way to both 'covetousness of low-earners' and 'generosity of low-earners' categories. He stated that some of his partners '*acted as if they were willing not so much to improve their own payoffs but instead to make me lose as much as possible*,' which referred to a doubleheader with a low-earner trying to extract maximum amount in taxes, irrespective of the cost it inflicted on his partner. Then he also said that '*the last one was completely different – low taxes and on top of that he was transferring some money to me even though he had less than I.*'

[12] Not only the largest number of persons provided negative responses but also subjects were most likely to give more than one negative label to their partners' behaviour. All in all, 48 persons offered 73 negative labels (on average 1.52 per person), 25 persons offered neutral labels (on average 1.20 per person), and 23 persons offered 24 positive labels (on average 1.04 per person).

participants employed tactics to rob me of my hard-earned possessions.' Both complaints certainly had substance to them. In the 15 PLN group, 6 out of 11 accusations of the 'rich' being stingy came from subjects who had received the lowest average gift transfers from high-earners (ranging from 0.02 to no more than 0.19 PLN). Similarly, in 60 PLN group, 6 out of 11 accusations of the 'poor' being covetous came from subjects who had suffered the highest average tax vote by low-earners (ranging from 82 to 94%).

Subjects in the 30 PLN group were in a somewhat special position – in the course of experimental session they switched between being low-earners (against 60 PLN) and high-earners (against 15 PLN). It is telling that 11 of them were willing to disparage behaviour of low-earners whereas merely 4 of them condemned high-earners for their stinginess. This may serve as an anecdotal illustration of Kahneman and Tversky's prospect theory (1979): gains and losses are not perceived symmetrically. In this case, losses incurred by high level of enforced redistributive taxation gave rise to more negative comments than gains unrealized due to better-off partners' reluctance to share.

Apart from 'stinginess of the rich' and 'covetousness of the poor,' the third most frequent observation referred to reciprocal actions of one's partners. More often than not, reciprocation mentioned was cooperative in character and consisted in some kind of higher-gifts-for-lower-taxes agreement.

Motivations behind subjects' own actions

As far as subjects' own motivation is concerned, three themes came to the fore in all three earning groups:

- own interest ('*I was willing to secure myself the highest possible gains*');
- reciprocity ('*by transferring small amounts I tried to induce other participants to lower their tax proposals*'; '*if somebody was kind enough to give me some amount freely I was lowering my tax vote, and vice versa*');
- group efficiency ('*let's not introduce tax or we'll lose some part of our common pool of money*').

It is noteworthy that subjects in the lowest earning 15 PLN group were most explicit about being guided by their own self-interest (see Table 4). As a matter of fact, they admitted self-interest three times more often than reciprocity (in proportion 17:5), whereas in the other two groups self-interest and reciprocity were on the same footing (9:9 in 30 PLN, and 11:13 in 60 PLN). This seems to be derivative of the particular structure of the redistribution game used in the experiment. It was in high-earners' interest to uphold the status quo of initial earnings and so their self-interest did not manifest itself in any payoff-changing actions. For low-earners, on the contrary, any positive tax vote disturbed status quo to their advantage and thus was a self-evident example of acting on their own interest[13]. By the same

[13] One may also convincingly argue that status quo, completely apart from being in the interest of high-earners, constituted a fair distribution of payoffs. During the pre-experimental meeting subjects, yet unaware of their particular roles in the experiment, were asked to

token, initiating reciprocal substitution of high-taxes with free-giving was clearly a self-defending action on part of high-earners, even as it could be to the benefit of the other party as well.

Table 4. Motivations behind subjects' decisions

15 PLN earners (n=23)	**N**
own interest	17
group efficiency	6
reciprocity	5
fairness	2
equalization of incomes	2
reducing harm to others	1
minimization of own losses	1
partner's income[13]	1

30 PLN earners (n=23)	**N**
own interest	9
reciprocity	9
group efficiency	8
minimization of own losses	4
helping low-earners	3
(it depends)	3
partner's income[13]	2
equalization of incomes	2
fairness	1

60 PLN earners (n=24)	**N**
reciprocity	13
own interest	11
group efficiency	6
minimization of own losses	5
helping low-earners	1
reducing harm to others	1
partner's income[13]	1
equalization of incomes	1

It is sobering to realize that fairness as a guiding principle was invoked explicitly only by a single subject:

> [I based my choices] *on actual income difference and the amount of work performed (to make it more or less fair).*

Merely two more subjects implicitly hinted at respecting, at least to some extent, other people's initial incomes as fairly earned:

> *In the course of time I came to the conclusion that my partner's 60 PLN wasn't a 'windfall gain' and that he had to do some work on it so after the second round I started setting tax at low level.*

> [I sought] *equal split but not in the absolute sense as if the person who had earned her sum of money had to share with me only because I was less lucky.*

Scant presence of direct fairness considerations in subjects' statements provides much food for thought as certainly everybody was well aware that initial payoffs were earned in proportion to participants' own efforts instead of being distributed haphazardly. It is even more revealing given that one of the pre-experimental tasks was to decide upon fair allotment of initial payoffs in the experiment.

---

divide 105 PLN between three persons burdened with decoding 1, 2 and 4 pages of coded text (tasks subjects themselves were soon afterwards asked to perform to earn their initial payoffs). 60% decided that 15:30:60 was a fair distribution in such a situation and another 15% thought it fair to make distribution of payoffs even more unequal (e.g. 10:25:70).

[14] This category includes statements to the effect that subjects conditioned their choices on the their partners' initial incomes. However no motive (either explicit, or implicit) to equalize incomes was mentioned.

Hypothetical communication between players

The last question in the post-experimental survey was about hypothetical communication between players. What common way of conduct would they propose to their partners?

It is clear from subjects' responses that their primary concern in hypothetical negotiations would be for reaching some sort of Pareto-optimal agreement. All in all, 49 persons made comments to that effect, with 35 of them explicitly mentioning a trade-off between free gifts and taxes as a mechanism for achieving Pareto-optimality[15]. The tax-gift substitution may be construed here as a friendly Tit-for-Tat strategy in Iterated Prisoner's Dilemma (Axelrod 1984).

The following are three examples of comments that either express concern for group efficiency in general, or directly propose a reciprocal solution, or both:

- [I would suggest] *optimization of profits, i.e. my objective would be that both I and the other person get as much as possible, and the state* [= tax collector] *gets the least*;
- *that she votes no taxes, and I give her as much as I would have to pay in taxes anyway*;
- *transferring money instead of taxes – then together we don't waste anything on tax costs – more money could be distributed in a more satisfying way.*

These and other hypothetical communications are categorized in Table 5.

Table 5. Common way of conduct proposed in hypothetical communication*

Ideas proposed	Subjects' initial income			Total (n=70)
	15 PLN (n=23)	30 PLN (n=23)	60 PLN (n=24)	
substituting taxes with gifts (Tit for Tat)	11	12	12	35
concern for group efficiency	4	9	7	20
equalization of incomes	4	2	2	8
(no sensible idea)	3	1	2	6
fairness	1	1	1	3
upholding status quo	0	3	0	3
undefined consensual solution	0	1	1	2
(it depends)	1	0	1	2
minimization of own losses	1	0	0	1
more rationality	1	0	0	1

* Multiple categories possible for a single person.

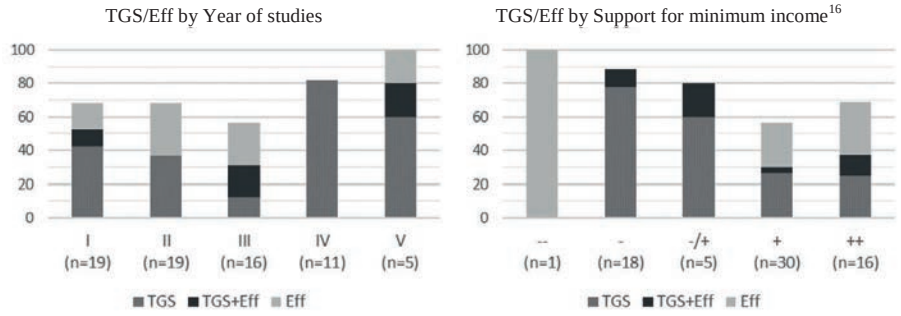
[15] To be sure, desire for group efficiency is implicit in tax-gift substitution proposal. On the other hand, concern for efficiency does not necessarily imply tax-gift reciprocation (for instance, a high-earner could think of sticking to status quo payoffs as a means of avoiding inefficiency inherent in the tax system).

Pareto-optimizing reciprocal solution, i.e. substituting taxes with gifts, was explicitly recognized in all earning groups with equal frequency. However, it is interesting that it depended heavily on two factors: age (as measured by year of studies) and subjects' opinion on state-guaranteed minimum income[16]. In Figure 3, we analyse those relationships by categorizing efficiency-concerned subjects into three groups:

1. Those who simply stated that they would like to implement tax-gift substitution [TGS];
2. Those who elaborated on TGS being a means for achieving efficiency [TGS+Eff];
3. Those who merely declared their desire for efficiency without explicit reference to TGS [Eff].

First two of the above categories comprise of experimental subjects explicitly advocating mutual adoption of Pareto-optimizing Tit-for-Tat strategies.

Figure 3. Prevalence of tax-gift substitution (TGS) and concern for group efficiency (Eff) in hypothetical communication by year of studies and support for state-guaranteed minimum income



Clearly, we observe a rapid increase in advocacy for Tit-for-Tat strategies after third year of studies which may be interpreted as an indication of older subjects being more strategically sophisticated.

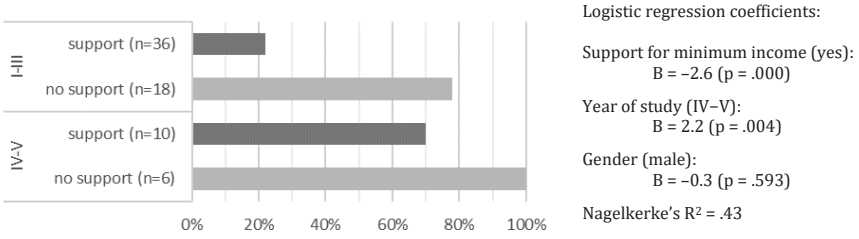
More interestingly, there has been a vast disparity in TGS reciprocation between supporters of state-guaranteed basic income and those uncertain or opposed to it. Explicit Tit-for-Tat advocacy was more than twice less prevalent in the former group's hypothetical communication.

The effect of support for state-guaranteed minimum income (as presented in Figure 4) turns out to be statistically significant predictor of Tit-for-Tat advocacy in logistic regression model with control for subjects' gender and year of study. Certainly, no definite answer can be given to explain why such an effect should take place. Nonetheless, one may surmise that persons conceiving of basic income as

[16] In the pre-experimental questionnaire subjects were asked to express their opinion on the following statement (adopted from Polish General Social Survey): 'The government should provide everyone with a guaranteed basic income.' Available responses were: 'strongly agree (++) / agree (+) / neither agree, nor disagree (-/+) / disagree (-) / strongly disagree (--).'

a kind of human right could be somewhat reluctant to discuss the redistribution problem in terms of bargaining. They would be more inclined to invoke efficiency in general[17], or even to make a direct appeal to equality[18]. Now all this, of course, may be a peculiarity of the present study. Still, it is plausible that subjects' socio-political beliefs about real-life issues concerning income distribution should affect their attitude in experiments, especially in a game overtly construed as a redistributive tax system under democratic rule.

Figure 4. Tit-for-Tat advocacy by year of study (I–III vs. IV–V) and support for minimum income law



What if communication was possible?

There was no experimental condition allowing for communication between players but it is instructive to analyse if there is any difference in actual behaviour between players who (post factum) advocated the adoption of Tit-for-Tat strategies and those who did not. It turns out that there is some. At the same time there are clear-cut examples of how inability to communicate may be a hardly passable stumbling block on the path to cooperation. This is in accord with evidence from Prisoner's Dilemma and public good experiments, where 'preplay communication, which should have no effect in theory, is the non-payoff variable that raises the rate of cooperation by the most' (Camerer 2003, p. 46).

In Table 6, we compare average decisions made in redistribution game by Tit-for-Tat advocates (TFT) with those made by other players (non-TFT). As Tit-for-Tat is equivalent to tax-gift substitution, we focus our attention on low-earners' tax votes and high earners' voluntary gifts. To be sure, the 15 PLN were low-earners throughout the experiment just as the 60 PLN were high-earners. In contrast, the 30 PLN were switching roles: they were low-earners when matched against the 60 PLN (in such a setting we analyse their tax vote) and high-earners when matched against the 15 PLN (in such setting we consider their voluntary gift).

[17] Indeed, 13 out of 14 persons expressing concern for efficiency without direct reference to Tit-for-Tat strategies ('Eff' boxes in Figure 3) were proponents of state-guaranteed minimum income.

[18] Out of 8 hypothetical communications calling for 'equalization of incomes,' 7 came from proponents of basic income law.

Table 6. Low-earners' tax vote and high-earners' voluntary gift. Decisions made by Tit-for-Tat advocates (TFT) and the rest (non-TFT)

Decision		**Tax vote**			**Voluntary gift**		
Decision-maker: Player		15 PLN		30 PLN		60 PLN	
Partner		30 PLN	60 PLN	60 PLN	15 PLN	15 PLN	30 PLN
Player's type	TFT	50.4	39.2	59.3	0.58	3.55	3.84
	non-TFT	68.1	79.9	45.9	0.78	0.51	0.39
Difference		-17.7	-40.7	13.4	-0.2	3.0	3.4
*p**		0.193	0.007	0.288	0.683	0.062	0.078

*Exact significance (2-tailed) in Mann-Whitney test. The size of each group was between 10 and 12.

In Table 6, we compare average decisions made in redistribution game by Tit-for-Tat advocates (TFT) with those made by other players (non-TFT). As Tit-for-Tat is equivalent to tax-gift substitution, we focus our attention on low-earners' tax votes and high earners' voluntary gifts. To be sure, the 15 PLN were low-earners throughout the experiment just as the 60 PLN were high-earners. In contrast, the 30 PLN were switching roles: they were low-earners when matched against the 60 PLN (in such a setting we analyse their tax vote) and high-earners when matched against the 15 PLN (in such setting we consider their voluntary gift).

In the 15 PLN group, we observe that TFT players were voting lower taxes than non-TFT, especially against the 60 PLN, where the difference amounts to whole 40 percentage points and is statistically significant. On the other end of the payoff scale, in the 60 PLN group, TFT players were offering substantially higher gifts than non-TFT and the differences are on the verge of statistical significance[19].

Of course, we should allow for reverse interpretation of causal path for it might also be the case that it had been actual experience of reciprocity that subsequently prompted subjects to invoke Tit-for-Tat strategy. If so, there should be some differences in partner's behaviour experienced by TFT and non-TFT players.

As evidenced by the data in Table 7, only in the 15 PLN group Tit-for-Tat advocates received significantly better treatment (from the 60 PLN). Other differences were far from significant, and some – like tax vote experienced by the 30 PLN from the 15 PLN – had the opposite direction, i.e. it was TFT players who had suffered larger tax burdens imposed by low-earners. Furthermore, it should be noted that TFT advocates were describing their partners' behaviour in no better terms than non-TFT. As a matter of fact, they were more likely to complain of other people's 'lack of rationality' and 'lack of reciprocation.'

[19] One should bear in mind that we have very small samples here and thus it takes a really strong effect to turn out statistically significant.

Table 7. High-earners' voluntary gift and low-earners' tax vote. Partner's decisions experienced by Tit-for-Tat advocates (TFT) and the rest (No TFT)

Decision		Voluntary gift			Tax vote		
Player		15 PLN		30 PLN		60 PLN	
Decision-maker: Partner		30 PLN	60 PLN	60 PLN	15 PLN	15 PLN	30 PLN
Player's type	TFT	0.47	3.41	2.48	67.1	55.2	58.6
	No TFT	0.84	0.72	1.91	45.6	64.9	49.3
Difference		-0.37	2.68	0.57	21.5	-9.7	9.3
p*		0.911	0.053	0.727	0.118	0.880	0.799

* Exact significance (2-tailed) in Mann-Whitney test. All sample sizes were between 10 and 12.

Misadventures of mute cooperation – a case study

A perfect illustration of how the inability to communicate could thwart cooperation is provided by games from one experimental session where 5 out of 6 subjects were aware of the mutually beneficial tax-gift substitution. First, let us consider their motivations and hypothetical communication proposals (subject are labelled by their experimental nicks).

Table 8. Own motivations and hypothetical communications by subjects in session #11 (males)

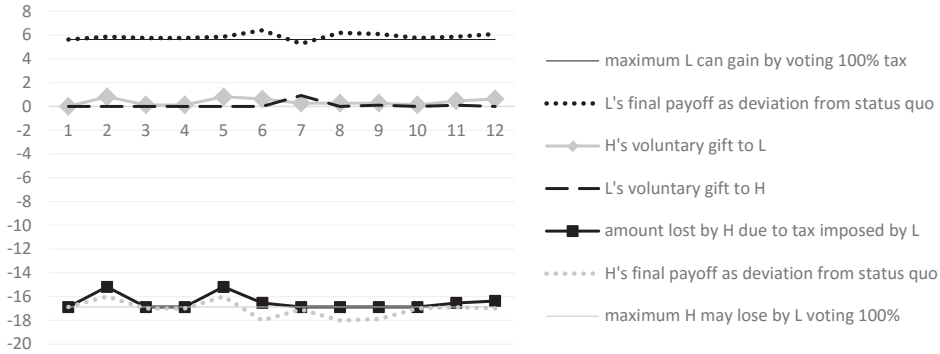
Kadr (60 PLN)	[I was basing my decisions on] *the tax rate imposed by the other person in a previous round and my willingness to initiate 'dialogue'… Let's profit together.*
Kana (60 PLN)	[I wanted to keep] *tax at its lowest because of the inherent cost. I was willing to pass 10 to 20% of my income.*
Kent (30 PLN)	[I would propose to have] *0% tax and share thus acquired 'profits' fifty-fifty.*
Klon (15 PLN)	*I would propose we both vote 0%… I would then expect my partner to transfer an amount making up for my losses… I would gain a good deal and the other person would lose less than if I voted 100%.*
Koch (15 PLN)	*Zero taxes, equalization through free giving.*

Now, it is obvious from the above statements that subjects, irrespective of their initial income position, were all interested in a sort of Tit-for-Tat arrangement with free giving and no taxes. However, this is very far from what actually happened in their games, as evidenced by the following series of game charts in Figures 5-8. Charts visualize both the players' decisions and the payoffs through 12 rounds of the redistribution game[20]. In the charts, topmost and bottommost thin horizontal lines indicate, respectively, the amount that a low-earner (L) could gain and a high-earner (H) lose due to low-earner's uncooperative voting for 100% redistributive

[20] Each one of the charted games was played at high 30% cost of tax redistribution and followed immediately after a game at 10% cost played with the same partner. However, the latter was unknown to the subjects and most of them surmised that they had been matched against a new partner.

tax. Solid grey and black lines with square markers indicate, respectively, H's free gifts to L, and amounts lost by H due to tax imposed by L. Dashed line traces L's free gifts to H, and dotted lines represent final payoffs in particular rounds expressed as deviations from initial incomes. If players voted 0% tax-rate and offered each other no gifts throughout the whole game all lines would coincide and run horizontally at zero-level (that is except for the 'maximum' lines).

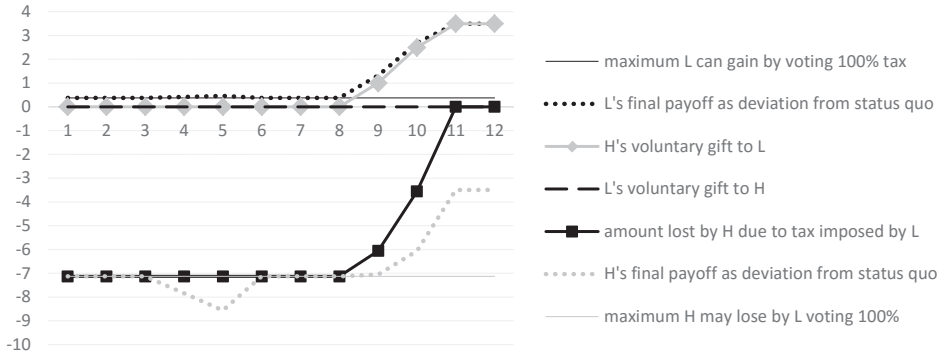
Figure 5. Game #108 (first partner): Koch (15 PLN) – Kadr (60 PLN)



In Figure 5 we witness faint and utterly failed attempts at cooperation by both players. High-earner, Kadr, makes varied little gifts (less than 1 PLN), not very attractive to Koch who in this game can assure himself as much as 5.63 PLN gain in tax benefits. This is exactly what he does most of the time, thus imposing on Kadr a concomitant loss of more than 16 PLN. Every now and then Koch is probing his partner's reaction with slightly diminished tax-vote (e.g. in rounds 2 and 5) but, in the last analysis, both players' frail and erratic cooperative gestures are futile and the game never strays too far from its dismal equilibrium track.

Simultaneously, another game, visualized in Figure 6, was played between Kent (30 PLN) and Koch (15 PLN). They both used strategies that amounted to 'suspicious Tit-for-Tat,' namely 'don't cooperate unless the other player initiates cooperation.' Accordingly, in the first eight rounds, Koch was receiving no free transfers from Kent and was himself voting 100% tax rate, which basically mimicked the uneventful history of their first game at 10% cost. Thus he was inflicting 7.13 PLN tax on his better-off partner only to gain a meagre 0.38 PLN tax benefit for himself. Finally, in round 9 Koch ventured to lower his defences a little bit and slightly diminished his tax vote. Kent responded in kind, and step by step they established a full-blown cooperation by round 11. They enjoyed the fruits of tax-gift substitution in the twelfth round as well, and then the game was over. A peculiarly bitter happy end it was as they must have reflected upon the uncooperative stalemate that ruled supreme for most of the game.

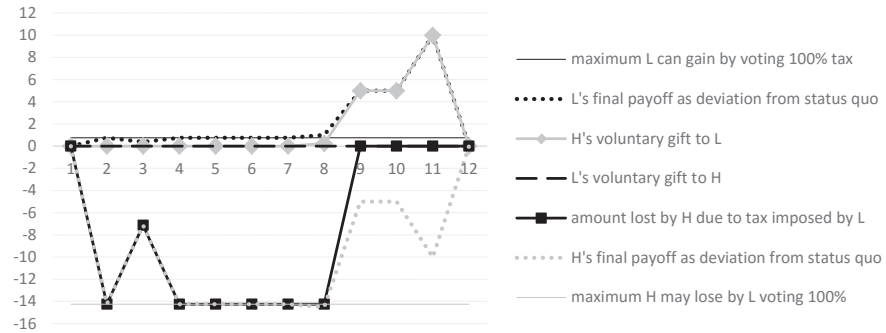
Figure 6. Game #12 (first partner): Klon (15 PLN) – Kent (30 PLN)



It is instructive to follow Kent and Klon to their games with newly matched partners. Would they capitalize on their recently experienced late ascent to cooperation? Well, they tried. In his next two games, Kent was a low-earner facing 60 PLN player nicknamed Kadr and indeed he did open both games with a 0% tax vote. However, Kadr failed to make an immediate cooperative response and the game deteriorated to no-gift maximum-tax equilibrium with only two occasional attempts at cooperation on part of Kent, again unreciprocated.

In Figure 7, we see the second game between Kent and Kadr.

Figure 7. Game #84 (second partner): Kent (30 PLN) – Kadr (60 PLN)



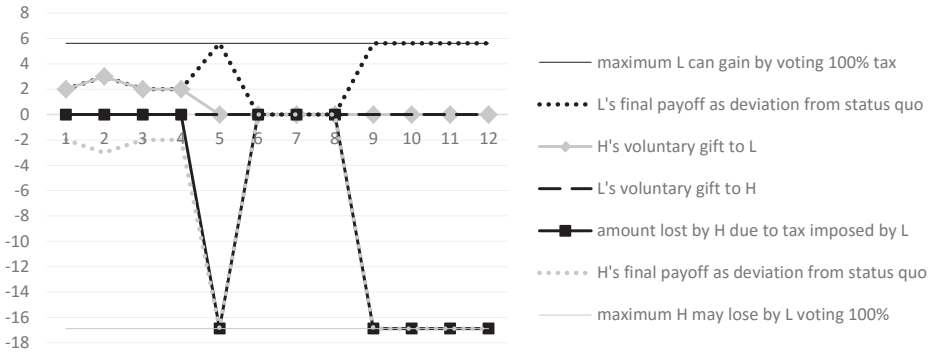
Again, Kent initiated the game with a 0% tax vote and yet again Kadr failed to respond immediately. In effect, rounds 2 and 4 through 8 were devoid of any trace of cooperation. Unexpectedly, in round 9 Kent dropped his tax-vote to zero and finally managed to coax Kadr into mutually beneficial cooperation which lasted for two more rounds. In the last round, Kadr defected on Kent, probably willing to recover half of the double-sized gift he offered him in round 11 as an incentive to vote no taxes in round 12.

Finally, let us follow Klon's adventures in his last two games played against Kana (60 PLN). In the first game, he consistently voted a 0% tax-rate and was receiving gifts of ca. 5 PLN. The problem with this arrangement was that Klon could

secure himself as much as 9.38 by voting 100% tax and so efficient cooperation was really an exercise in self-sacrifice for him. Worse, Kana tried to take advantage of his partner's good will as in the last four rounds he cut his donations to be less than half of what they used to be so far.

Figure 8 visualizes their second game. It started as if it was a continuation of the previous one: no taxes and insufficient gifts. In round 5, Klon's resolve to sustain disadvantageous cooperation finally broke down and he voted 100% tax. Kana responded by withholding the gift. In rounds 6 through 8, Klon tried to re-establish cooperation but to no avail – and since round 9 the game deteriorated to a grim uncooperative equilibrium routine.

Figure 8. Game #132 (second partner): Klon (15 PLN) – Kana (60 PLN)



These games provide an ample illustration of how difficult it may be to initiate and sustain cooperation in a Prisoner's Dilemma type of situation where participants have no effective means of communication. Even with all participants concerned about social losses due to entrenched defection and privately willing to establish mutually beneficial Tit-for-Tat agreement, long-lasting cooperation is a far shot.

Some remarks on ecological validity

To be succinct: 'Ecological validity is the extent to which research findings would generalize to settings typical of everyday life' (Wegener, Blankenship 2007). Certainly, it would be rather silly to claim that experimental framing of a two-person redistribution game made it a straightforward model of real-life redistribution processes in a democratic society. That granted, we may still expect certain factors of the situation to work on a similar basis. Half a century ago, Morris Zelditch (1969) asked 'Can you really study an army in the laboratory?'. His conclusion boiled down to an observation that 'while you cannot take an army into a laboratory, you certainly can study important theoretical features of armies' (Webster, Sell 2014, p. 20). By the same token, in the present experiment attention was focused on crucial circumstances under which redistributive policies are shaped and implemented. One such aspect is pre-tax income inequality, another is the scope of wastefulness inherent in the system.

Maximum efforts were taken to provide clues for experimental subjects that what they participated in was not a parlour game but a session of serious decision-making with financial consequences for all involved. Thus both in recruitment ads and introductory pre-experimental speech subjects were informed that

> The aim of the experiment . . . is to better understand processes related to wage setting, tax voting and decision-making concerning monetary transfers to other persons.

More concretely, their role in the experiment was explained in the following terms:

> Today you will be asked to fill out a questionnaire concerning various issues that refer to earning money, taxes, income inequalities, etc. Then, we have a certain set of tasks prepared for you, a job you will be paid for . . . . Next time we meet in the computer laboratory where you will make decisions concerning money you will have earned today.

The tasks that were to be performed on spot were time-consuming and paid by piece rate. Therefore all subjects knew well that all money in the experiment was earned and that earnings were in direct proportion to the amount of job done. They were even asked, 'behind the veil of ignorance,' to make fairness judgments about experimental payoff scheme. Hence we know that to a large extent they believed that initial payoffs of 15, 30, and 60 PLN had been fairly earned. Now did this no-nonsense framing of the experiment become a part of how subjects perceived the whole situation? Did their experimental choices have anything to do with their political beliefs and moral convictions concerning real-life social processes? They were not asked about it in the post-experimental survey for fear that such questions, when publicized, could influence behaviour of other persons in the future sessions. But it is worthwhile to conclude this article with a number of comments that subjects spontaneously made to that effect.

Thus Biel (30 PLN) complained of 'ingratitude' of her partners:

> *They didn't want to change their tax proposals even though I encouraged them with 'symbolic' transfers of certain sums of money. Such behaviours may be observed in everyday life – people would like some, e.g. the rich, to pay taxes and make donations – 'give them an inch, and they'll take a mile.'*

Haft (60 PLN) offered one of the most elaborate accounts of player's own motivations in the game:

> *I was guided by a general economic conviction that taxes should be minimized. . . . Besides, I consider the very idea of equalizing taxation to be socially, economically, and ethically misguided. I was transferring money out of a simple need to share (with persons 3 and 4), for even though the disparity was rooted in disparate amounts of job done, I was willing to compensate it somehow. The fact that the amount of job to be done was determined by chance (rather than by choice) certainly had some relevance here. My second motivation was a desire to persuade my partner (persons 1 and 2) to lower the taxes. I didn't want money to be dissolved in procedural costs, and at the same time I wanted somehow to show those people that a higher tax imposed on the better-off does not lead to enriching*

the poor, and that general lowering of the rates may bring about much better result. Thus I simply cared for my own interest, but also tried to teach others a deal.

Horn (15 PLN) took the survey opportunity to offer a meticulous self-critique:

The study was certainly a good idea and I think the findings will be descriptive of the whole society, unfortunately with certain exceptions. As I mentioned before, I had 15 PLN so I was always the poorer [of the two] and each time I felt the urge to choose the highest equalizing tax in order to grab some part of my partner's income… such behaviour is quite typical of Polish paupers who prefer, out of envy, to take from the rich only because the latter are better-off. So in the first two rounds my behaviour could exemplify such an attitude. But as I mentioned before, in subsequent rounds I decided to vote lower taxes so as not to take money from persons who had to work for it after all.

Chem (30 PLN), on the other hand, felt he should justify his choices in high-earner's position:

Allow me to write a few words. If I am correct, I think the experiment was testing whether people declaring certain attitudes are faithful to them in reality. If so, I think it doesn't fully reflect the phenomenon, i.e. declaration vs. behaviour. For example, in the survey I declared rather left-wing views. I wrote that income disparities should be smaller, that poor people should be assisted, etc. During the session I didn't give money to a person I was matched with. But (in my opinion) the level of the whole society, the state, etc. is different from managing money at micro-level, where my main concern was to get a few zlotys for a ticket home, or for kilograms of photocopies that I need to make for the quickly oncoming examination period. I knew that by giving nothing at all to the other person I'm not depriving him of life's necessities, and that either way he will leave the experiment with a certain sum of money.

For Etna (60 PLN), taking part in the experiment was *'a stimulus to reflect upon* [her] *attitude to financial issues'*. Finally, Cedr (30 PLN) mentioned that after the experiment subjects went on discussing their choices in the redistribution game:

Some of them played similarly to me, which I liked, others did not. It seems that some of them didn't feel strategy but after we had left the laboratory it turned out that they had their strategies and could argue them all right ☺

Indeed, it is the case that certain behaviours in the experimental game were seemingly irrational until explained by the subjects. Why should the high-earners vote for positive taxes if they could transfer the same amount freely without incurring the additional cost? Or why should the low-earners vote high taxes and then make gifts to their better-off partners? Well, from the subjects' post-experimental statements we learn that these were not necessarily symptoms of insanity. They could have been premeditated, even if desperate, attempts at signalling friendly attitude and spurring cooperation. So in the end it seems that in the social world there is a method to every madness.

Conclusions

Data from pre- and post-experimental surveys may provide us with clues about factors affecting the subjects' behaviour in the experiment, as well as help us better understand and interpret motivations behind their actions. Two such factors that turned out to have some influence on the subjects' perception of the optimal behaviour in the redistribution game were beliefs about state-guaranteed minimum income and year of studies. Older students were much more likely to formulate a hypothetical negotiated solution for the game in terms of mutual use of Tit-for-Tat strategies characteristic of repeated Prisoner's Dilemma. This suggests that students' strategic sophistication is linked to age. Since many game-theoretic experiments have students for experimental subjects, it would therefore be advisable to perform such experiments on groups within narrow age-brackets, or at least to gather information on subjects' age for the purpose of statistical control.

Allowing for communication between players could immensely affect the likelihood of establishing a full-blown cooperation. With all channels of communication blocked, even cooperation-conscious players find it hard to overcome mutual defection which constitutes unique equilibrium in a repeated Prisoner's Dilemma when the total number of rounds is common knowledge among players. Problems caused by the inability to negotiate common way of conduct are further exacerbated by the fact that people will tend to read hostile, reckless, or irrational actions into other people's decisions that affect them negatively.

References

Axelrod R. (1984). *The Evolution of Cooperation*. Basic Books. New York.

Camerer C.F. (2003). *Behavioral Game Theory. Experiments in Strategic Interaction*. New York: Russell Sage Foundation.

Czarnik S. (2009). *Proportionality and Two Kinds of Fairness*. In: J. Bacher, J. Górniak, M. Niezgoda (eds.), *Selected Research Papers in Education, Labour Market and Criminology*, vol. 1. Linz: Trauner Verlag. p. 103–109.

Czarnik S. (2007). *Sprawiedliwość i równość w podziale dóbr wypracowanych. Formalny model redystrybucji w warunkach przymusu i dobrowolności* (in Polish). Ph.D. thesis. Uniwersytet Jagielloński, Kraków.

Czarnik S. (2006). *Justice in the Shadow of Self-Interest. An Experiment on Redistributive Behavior.* Acta Physica Polonica B, 37, p. 2967–2977.

Friedman M. (2002). *Capitalism and Freedom. 40th Anniversary Edition*. Chicago and London: The University of Chicago Press.

Hazlitt H. (1969). *Man vs. the Welfare State*. New Rochelle, N.Y.: Arlington House.

Kahneman D., Tversky A. (1979). *Prospect Theory: An Analysis of Decisions under Risk.* Econometrica, 47, p, 263–291.

Kreps D.M,, Milgrom P., Roberts J., Wilson R. (1982). *Rational Cooperation in the Finitely-Repeated Prisoners' Dilemma*. Institute for Mathematical Studies in the Social Sciences, Stanford University.

Webster M., Jr., Sell J. (2014). *Why Do Experiments?* In: M. Webster Jr., J. Sell (eds.), *Laboratory Experiments in the Social Sciences*, 2nd ed. San Diego, CA: Academic Press, p. 5–21.

Wegener D.T., Blankenship K.L. (2007). *Ecological Validity*. In: R.F. Baumeister, K.D. Vohs (eds.), *Encyclopedia of Social Psychology*. Thousand Oaks, CA: Sage Publications, p. 275–276.

Zelditch M. (1969). *Can You Really Study an Army in the Laboratory?* In: A. Etzioni (ed.), *Complex Organizations*, 2nd ed. New York: Holt, Rinehart, Winston, p. 528–539.

Czytanie w myślach uczestników eksperymentu. Wnioski z kwestionariuszy wypełnianych przed i po eksperymencie z grą redystrybucyjną

Wypowiedzi badanych z kwestionariuszy przed- i poeksperymentalnych wykorzystane zostały do zinterpretowania ich zachowań w grze redystrybucyjnej o strukturze asymetrycznego Dylematu Więźnia bez komunikacji między graczami. Badani w przeważającej mierze negatywnie oceniali intencje swoich partnerów, podczas gdy swoje własne decyzje określali jako motywowane racjonalnym interesem własnym, wzajemnością i troską o efektywność. Przy braku komunikacji atrybucja złych intencji może być więc jedną z głównych przeszkód na drodze do ustanowienia trwałej kooperacji, nawet wówczas, gdy obydwaj gracze w pełni zdają sobie sprawę z tego, jakie korzyści niesie ze sobą współpraca i jakie działania są konieczne do jej osiągnięcia. Tym niemniej zebrane dane świadczą o tym, że gracze świadomi Pareto-optymalizującego potencjału tkwiącego w obustronnym przyjęciu strategii wet za wet na ogół podejmują w toku gry bardziej przyjazne decyzje. Wreszcie w świetle poeksperymentalnych wypowiedzi badanych, oceniamy trafność ekologiczną eksperymentu redystrybucyjnego.

Słowa kluczowe: behawioralna teoria gier, Dylemat Więźnia, redystrybucja podatkowa, kooperacja, interpretacja intencji