No. 49-2013

Christoph Bühren and Thorben C. Kundt

Imagine Being a Nice Guy: A Note on Hypothetical Vs. Incentivized Social Preferences

IMAGINE BEING A NICE GUY:
A NOTE ON HYPOTHETICAL VS. INCENTIVIZED SOCIAL PREFERENCES

Christoph Bühren[i] *and Thorben C. Kundt*[ii]

[i] Department of Economics, University of Kassel, Germany
[ii] Department of Economics, Helmut-Schmidt-University, Hamburg, Germany

ABSTRACT

We conducted an experimental study on social preferences using dictator games similar to Fehr et al. (2008). Our results show that social preferences differ between participants who receive low-stakes monetary rewards for their decisions and participants who consider hypothetical stakes. The results were robust when we controlled for socio-demographic characteristics and participants' risk attitudes. Our findings indicate that, apart from incentives, gender plays an important role for the categorization of different social preferences.

Keywords: social preferences, generosity, egalitarianism, incentive mechanisms, dictator games

JEL classification: C91

Correspondence: Thorben C. Kundt, Department of Economics, Helmut-Schmidt-University, Holstenhofweg 85, 22043 Hamburg, Germany. Tel.: +49 40 6541 3409, Email: kundt@hsu-hh.de.

1. INTRODUCTION

The fields of economics and other social sciences, such as psychology, differ in their views on the use of monetary incentives in experiments. Economists usually argue that financial rewards create a more realistic environment within the lab (Rosenboim and Shavit, 2012), causing participants to consider their decisions more carefully (Carpenter et al., 2005). Psychologists, on the other hand, tend to believe that experimental participants are generally intrinsically motivated and need no financial reward for decision-making (Camerer and Hogarth, 1999). However, previous research provides empirical evidence that different incentive mechanisms usually, but not always, induce different behavioral responses from experimental subjects.[1]

In this study, we examined the effects of the presence or absence of monetary incentives on other-regarding behavior, that is, social preferences. Social preferences, such as egalitarianism or generosity, are argued to be highly relevant to decision-making in a variety of economic and social contexts such as philanthropy and charitable giving, organ donations, or family transfers (see Kolm and Ythier, 2006 for a comprehensive overview). However, exactly how monetary rewards affect those social preferences remains unclear. Compared to a hypothetical setting without financial rewards, we found that even low-stakes monetary incentives 1) decrease (strongly) egalitarian choices, 2) increase spiteful choices, but 3) also increase generous choices.

A common way to elicit social preferences is to use the dictator game (DG) in which a sender (*dictator*) decides how to allocate a sum of money to himself and a receiver.[2] There are only few studies on the effect of introducing financial incentive mechanisms in DGs and these report mixed results: Sefton (1992) found significantly more self-interested offers in a DG with a low-stakes financial reward compared with Forsythe et al.'s (1994) results for an equally designed hypothetical setting. In Dana et al. (2007), receivers in a binary DG were instructed to choose hypothetically between an equal and an unequal distribution, while the choices of dictators were incentivized:[3] Compared with the incentivized treatment, a larger share of participants picked the egalitarian option in the hypothetical treatment. Amir et al. (2012) reported that 1$ incentives in an online DG significantly decreased average offers compared to a no-stakes DG. On the contrary, Ben-Ner et al. (2008) showed that dictators facing decisions involving real money were slightly more generous compared with participants considering hypothetical money, but this difference was not significant in statistical and economic terms, even after controlling for subject-specific characteristics.

There are numerous models to describe different types of social preferences. In economics, the most popular ones are Fehr and Schmidt (1999), who incorporate envy and altruism in the utility function, the theory of equity, reciprocity, and competition (ERC) by Bolten and Ockenfels (2000), in which deviations from egalitarian distribution result in disutility, and the Quasi-maximin model by Charness and Rabin (2002), which takes into account the lowest payoff of a distribution. However, it is not easy to distinguish these different models in experiments (Daruvala, 2010). We used DGs similar to those of Fehr et al. (2008) which provided us with a simple way to categorize different types of social preferences. Participants were

---

[1] See Camerer and Hogarth (1999) for an overview.
[2] Engel (2011) provides a meta-study on DGs. For an overview of other games used to elicit social preferences, see Levitt and List (2007).
[3] This was done to keep the roles of senders and receivers anonymous.

presented with three sets of dichotomous choices to allocate money to themselves and another person. In the *prosocial game*, the dictator chose between two different allocations, (0.5,0.5) and (0.5,0). The dictator could increase his partner's payoff at no cost to achieve an egalitarian distribution. In the *envy game*, the dictator faced a choice between (0.5,0.5) and (0.5,1). An increase in the partner's payoff was only possible by deviating from the egalitarian distribution. In the *sharing game*, the feasible allocations were (0.5,0.5) and (1,0). Choosing the egalitarian option in the *prosocial* or the *envy game* indicates inequality aversion: In the former case, the decision maker does not want the other person to earn less than himself, and in the latter case, he does not want his partner to earn more. The *sharing game* can be regarded as a strong form of the *prosocial game* – the fundamental difference is that taking the egalitarian option in the sharing game is costly for the dictator.

Table 1 displays how the pooled decisions map into different categories of social preferences. The order of categories indicates the strength of social preferences (from *spiteful* to *strongly generous*). Spiteful subjects always choose options making their counterparts *worse* off. Weakly egalitarian subjects choose the egalitarian option whenever they are not disadvantaged; they are not spiteful but they also do not allow their counterparts to earn more than them. Weakly generous subjects grant their counterparts a higher payoff if this is at no cost for them. Strongly egalitarian subjects always choose the egalitarian option – no matter if it "hurts" others or them. Finally, strongly generous subjects *always* choose the best option for their counterparts in the three DGs, even if this means a costly transfer in the *sharing game*, and a deviation from the egalitarian distribution in the *envy game*.

Table 1: Subcategories of social preferences

Category	Prosocial game	Envy game	Sharing game
Spiteful	(0.5,0)	(0.5,0.5)	(1,0)
Weakly egalitarian	(0.5,0.5)	(0.5,0.5)	(1,0)
Weakly generous	(0.5,0.5)	(0.5,1)	(1,0)
Strongly egalitarian	(0.5,0.5)	(0.5,0.5)	(0.5,0.5)
Strongly generous	(0.5,0.5)	(0.5,1)	(0.5,0.5)

Source: Own compilation based on Fehr et al. (2008).

The dictator games of Fehr et al. (2008) have been applied in a variety of settings (e.g., Svensson, 2009; Bauer et al., 2011a; Bauer et al., 2011b; Fehr et al., 2011; Zaleskiewicz and Helka, 2011; House et al., 2012); experimental participants were usually children or adolescents, incentives were usually sweets. Fehr et al. (2011) provided small monetary incentives to a group of adolescents. In our experiment, we used an adult subject pool that was randomly assigned to an *incentivized treatment* and a *hypothetical treatment*. To our knowledge, we are the first to study hypothetical vs. incentivized decisions in the Fehr et al. (2008) DGs in an adult subject pool.

2. EXPERIMENT

The social preferences experiment involved three allocation decisions similar to the Fehr et al. (2008) DGs. Since the experiment lasted less than five minutes, it was preceded by two other unrelated experiments.[4] Combining short experiments this way is a common practice (see, e.g., Fischbacher and Föllmi-Heusi, 2013).

In total, six sessions were carried out at the experimental lab of the University of Hamburg in November 2012 with 150 students participating. Participants were invited via the recruitment software *hroot* (Bock et al., 2012). They received a 5.00 EUR show up fee that was announced in the invitation.[5] 90% came from Germany, 50% were male, and the average age was 25.14 ($SD = 4.73$).

Participants were randomly divided into two subgroups: 80 made decisions involving real money (*incentivized treatment*), 70 made hypothetical choices (*hypothetical treatment*) in the DGs. The assignment to the experimental conditions was independent from the treatments in the preceding experiments. The only differences across treatments was that respondents in the hypothetical treatment were instructed to *imagine* they could choose between two allocations within the DGs, whereas participants in the incentivized treatment were informed that one of their decisions and the decision of another experimental participant would be paid out to them (see Appendix A).

The experiment was computerized using z-Tree (Fischbacher, 2008). Possible allocations in the three DGs were presented to the participants as outlined in section one, with payoffs of 0.00 EUR, 0.50 EUR, and 1.00 EUR (see Appendix A).[6] To every dictator's decision one receiver was randomly matched. In order to avoid reciprocity, the matching procedure ensured that the roles of senders and receivers remained independent and anonymous: a dictator A sending a transfer to a receiver B received a transfer from another, unrelated dictator C. Participants were aware of this type of matching. The exercise was repeated for the three DGs; following Fehr et al. (2008), we kept the ordering of the DGs identical across subjects. Participants received no feedback in the one-shot DGs and transactions were kept anonymous in order to rule out that social preferences resulted from strategic behavior or that they were affected by selfish motives (Fehr et al., 2008).

In the incentivized treatment, one DG was randomly chosen and we paid out the money the participants allocated to themselves and received from another participant in that game. Average earnings were 1.15 EUR ($SD = 0.39$ EUR). After completing the experiment, participants filled out a questionnaire from which we only used demographics for this paper.

---

[4] The first experiment included a real counting task with varying levels of effort provision (treatment 1: *no effort*, treatment 2: *moderate effort*, treatment 3: *hard effort*) and focused on the effect of work effort on income tax evasion; the second experiment measured risk attitudes using incentivized Holt and Laury (2002) lotteries. Average earnings were 3.99 EUR ($SD = 0.99$ EUR). The experiments did not affect decisions in the DGs (see Sections 3; for details on the experiments: see Bühren and Kundt, forthcoming).

[5] This is the standard fee for students participating in the experimental lab at the University of Hamburg.

[6] The options in each of the DGs were designed in such a way that it was technically impossible to choose more than one allocation by using "radio buttons", which only allow the selection of one option at a time. Additionally, none of the options were preselected to avoid biased choices in favor of a default option.

3. RESULTS

3.1. HOMOGENEITY OF TREATMENTS

Table 2 demonstrates that participants in the two treatments did not significantly differ with respect to age, gender, income, and nationality. We also found no differences when it came to earnings in the previous two experiments. In addition, Table 2 (last three rows) shows a cross tabulation of the number of students from the two treatment conditions of the social preferences experiment assigned to one of the three treatment conditions in the tax evasion experiment. Again, there was no systematic difference between the sub-groups. We can thus rule out that results might have been driven by heterogonous sub-samples.

Table 2: Sample composition

| Variable | Treatment | | p-value |
	Incentivized	Hypothetical	
Age (years)	25.16 (5.15)	25.12 (4.23)	0.95
Gender (female)	0.51 (0.50)	0.49 (0.50)	0.75
Income (EUR)	768.36 (1777.83)	717.15 (518.69)	0.82
Nationality (German)	0.89 (0.32)	0.96 (0.21)	0.13
Previous earnings			
Tax evasion experiment (EUR)	3.50 (0.85)	3.48 (1.05)	0.91
Risk-elicitation experiment (EUR)	0.51 (0.23)	0.48 (0.21)	0.34
Treatment tax evasion experiment			
Endowed (# of students)	28	22	
Moderate effort (# of students)	26	25	0.88
Hard effort (# of students)	26	23	

Notes: Standard deviations in parenthesis; p-values obtained by t-tests except for the variable *treatment tax evasion experiment* (Fisher's exact test).

3.2. TYPES OF SOCIAL PREFERENCES

Figure 1 illustrates the percentage of participants by treatment that fall into the five categories of social preferences based on the aggregated decisions in the DGs.[7]

Examining the egalitarian category, we found that 48.6% of the participants in the hypothetical treatment could be categorized as *egalitarian* (weakly or strongly), but only 27.5% fell into this category in the incentivized treatment. The difference of 21.1 percentage points is highly significant (Fisher's exact test, $p = 0.01$, *two-sided*). Choices in the *sharing game* revealed that 21.4% of the participants in the hypothetical treatment picked the egalitarian distribution (0.5,0.5) in *all* DGs (*strongly egalitarian*), whereas the frequency dropped to 2.5% in the incentivized treatment (Fisher's exact test, $p < 0.01$, *two-sided*). Unlike in the *envy* and *prosocial game*, choosing (0.5,0.5) in the *sharing game* involved a costly transfer and thus represents a strong form of other-regarding behavior in terms of inequality aversion and altruism as defined by evolutionary biology (Fehr et al., 2008). Taken together, considering real money seriously influenced the equality motive, even for relatively low stakes. Similar results for DGs with low stakes were also reported by Sefton (1992) and Amir et al. (2012).

---

[7] The percentages for the hypothetical treatment do not add up to hundred because one participant could not be categorized.

Figure 1: Results of the behavioral subcategories (by treatments)
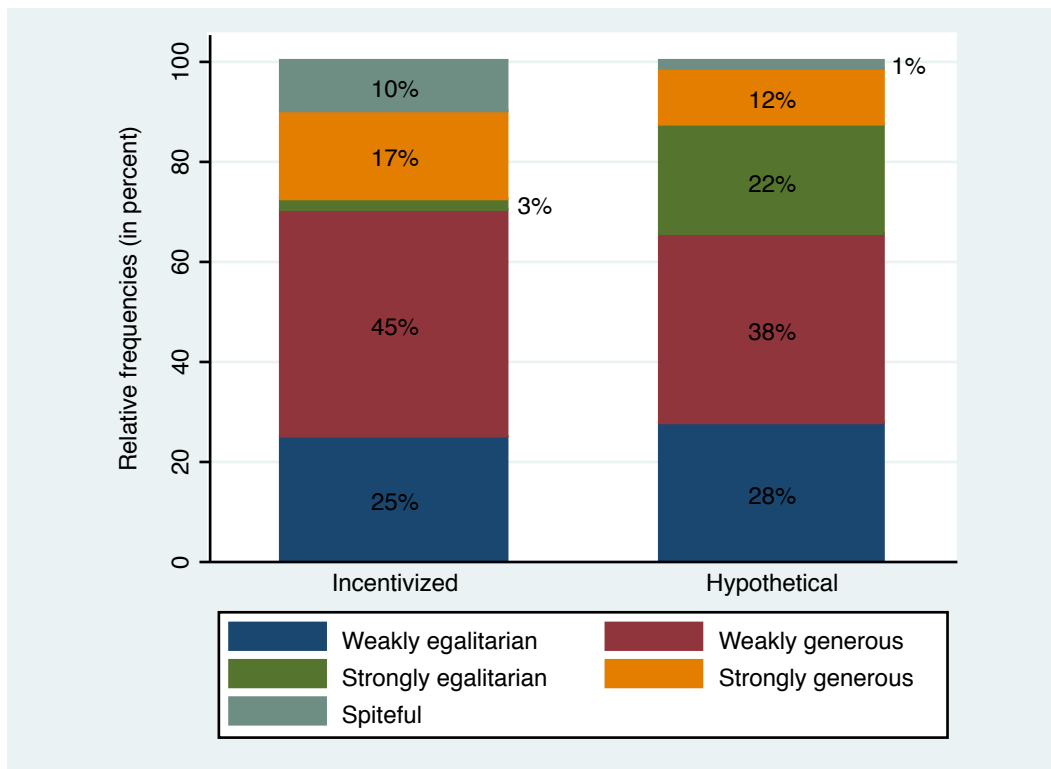
In contrast, we found that incentivized participants were slightly more generous. Pooling generous and strongly generous subjects resulted in a proportion of 62% in the incentivized, and 48% in the hypothetical treatment; yet this difference is not significant (Fisher's exact test, $p = 0.10$, *two-sided*. This pattern is in line with Ben-Ner et al. (2008), who found insignificantly larger generosity for real as compared with hypothetical choices in DGs.

Finally, examining the frequency of *spiteful* choices, we found a significant difference between the two treatments (Fisher's exact test, $p = 0.04$, *two-sided*); 10% of the incentivized participants chose the option that *minimized* their anonymous partner's payoffs in *all* DGs. In contrast, the frequency of spiteful choices was only 1% (i.e., only one out of 70) when participants only imagined being a dictator in the experimental setting.

With respect to gender, we found that the majority of men in our sample could be categorized as generous (68%), whereas most of the female choices fell into the category egalitarian (in sum 51% with 19% even strongly egalitarian) (see Figure 2 in Appendix B). In this respect, choices of women (*men*) are on average comparable to choices in our hypothetical (*incentivized*) treatment. According to two-sided Fisher exact tests, the treatment effect (incentivized vs. hypothetical) in the weakly generous as well as the strongly egalitarian category is significant for women ($p = 0.096$ and $p < 0.01$, respectively) but not for men. These findings suggest that women respond more to the introduction of monetary incentives. Similar to our result, Eckel and Grossman (1996) found in their "punishment game" that women are more responsive to changes in the incentive structure than men.

3.3. MULTIVARIATE ANALYSIS

We applied probit regressions to analyze additional factors affecting social preferences. For the five subcategories, we used dummies as dependent variables, with outcome 1 meaning that the observation falls into the subcategory and 0 that it does not. The models included a *treatment dummy* (0 = incentivized, 1 = hypothetical). We further took into account the socio-demographic information of *gender* (0 = male, 1 = female), *age,* and *income* (monthly net income). Furthermore, we controlled for participants' *risk attitudes* measured by means of the incentivized lotteries (Holt and Laury, 2002) in the previous experiment (Experiment 2 in footnote 4). Although dictators' decisions are not risky, Carlsson et al. (2005) found a strong correlation between risk and inequality-aversion. Table 3 shows a positive and highly significant treatment effect for the *strongly egalitarian* category; the marginal effect indicates that, ceteris paribus, subjects in the hypothetical treatment were 14.6 percentage points more likely to be strongly egalitarian than incentivized participants. The reverse effect could be seen for the *spiteful* category, for which we found a negative, albeit marginally significant, coefficient.

Table 3: Probit regression results for the subcategories

Variables	Weakly egalitarian		Weakly generous		Strongly egalitarian		Strongly generous		Spiteful	
	Coef.	Marg.	Coef.	Marg.	Coef.	Marg.	Coef.	Marg.	Coef.	Marg.
Treatment	0.036	0.011	-0.194	-0.076	1.641***	0.146***	-0.254	-0.053	-0.886*	-0.051
	(0.244)	(0.073)	(0.222)	(0.086)	(0.468)	(0.052)	(0.276)	(0.057)	(0.515)	(0.033)
Gender	0.477*	0.142*	-0.155	-0.061	0.939**	0.064	-0.803***	-0.171***	-0.195	-0.011
	(0.259)	(0.076)	(0.231)	(0.090)	(0.441)	(0.042)	(0.298)	(0.062)	(0.409)	(0.023)
Age	0.015	0.005	0.004	0.001	-0.017	-0.001	0.013	0.003	-0.030	-0.002
	(0.027)	(0.008)	(0.024)	(0.009)	(0.054)	(0.003)	(0.029)	(0.006)	(0.054)	(0.003)
Income	-0.000	-0.000	0.000	0.000	-0.001	-0.000	0.000	0.000	-0.001	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.000)	(0.000)	(0.000)	(0.001)	(0.000)
Risk attitude	-0.026	-0.008	0.087	0.034	-0.129	-0.008	0.015	0.003	-0.115	-0.006
	(0.075)	(0.022)	(0.068)	(0.027)	(0.117)	(0.008)	(0.084)	(0.018)	(0.122)	(0.007)
Previous experiments										
Income	-0.195	-0.058	0.212*	0.083*	0.160	0.010	-0.106	-0.022	-0.172	-0.010
	(0.147)	(0.044)	(0.127)	(0.050)	(0.206)	(0.013)	(0.158)	(0.033)	(0.239)	(0.014)
Treatment (ref.: A))										
B)	-0.333	-0.095	0.204	0.080	0.397	0.028	0.232	0.051	-0.326	-0.017
	(0.291)	(0.080)	(0.269)	(0.106)	(0.469)	(0.039)	(0.331)	(0.076)	(0.498)	(0.026)
C)	-0.413	-0.116	0.055	0.021	0.591	0.046	0.134	0.029	0.089	0.005
	(0.299)	(0.079)	(0.278)	(0.109)	(0.460)	(0.048)	(0.354)	(0.079)	(0.459)	(0.027)
Tax evasion	0.191	0.057	0.238	0.093	-0.790	-0.049	-0.126	-0.027	0.321	0.018
	(0.373)	(0.111)	(0.327)	(0.128)	(0.587)	(0.042)	(0.403)	(0.085)	(0.573)	(0.033)
Fined	0.182	0.056	-0.231	-0.089	0.442	0.033	-0.281	-0.056	0.378	0.025
	(0.273)	(0.085)	(0.257)	(0.098)	(0.431)	(0.039)	(0.330)	(0.062)	(0.423)	(0.032)
Constant	-0.318		-1.534*		-2.359		-0.583		0.807	
	(1.024)		(0.920)		(1.880)		(1.099)		(1.740)	
Pseudo R^2	0.071		0.065		0.338		0.093		0.190	

Notes: n = 144; standard errors in parentheses; *$p < 0.1$, **$p < 0.05$, ***$p < 0.01$; variables of previous experiments: *treatment* refers to the condition in the tax evasion experiment, *tax evasion* measures the average size of the tax evasion during the experiment (0%-100%), *fined* indicates that a fine was imposed because a participant was caught evading (for details, see Bühren and Kundt, forthcoming); in specifications with interaction terms of gender and treatment, we did not find any significant interaction except for the strongly egalitarian category (Ai and Norton, 2003). This is in line with our finding in 3.2.: The percentage of women categorized as strongly egalitarian drastically drops if money is at stake.

Decision-making behavior also differs by gender. Examining *weakly egalitarian* choices, we found that females were 14.2 percentage points more likely to fall into this category than men; this effect is, however, only marginally significant. With regard to *strongly egalitarian* decisions the coefficient for gender coefficient was significant and positive. This finding is in line with previous results from DGs (Croson and Gneezy, 2009). For *strongly generous* decisions, we found a converse gender effect: Male participants were 17.1 percentage points more likely to fall into this category than females. Income and risk aversion had no influence.

We also controlled for potentially confounding effects of the preceding experiments (variables below the dotted line). Neither did earnings in these experiments significantly affect the categorization into a class of social preferences[8], nor did we find any effects of treatments and other variables.

4. DISCUSSION AND CONCLUSIONS

In this paper, we presented the results of an experiment on social preferences elicited by using DGs similar to Fehr et al. (2008). We showed that incentivizing participants affects their choices in DGs and the categorization into different social preference classes.

(Almost) nobody wanted to be spiteful (only 1% of our subjects) when choices had no monetary consequences. Furthermore, strongly egalitarian choices that indicate an aversion of disadvantageous *and* advantageous distributions almost disappeared when people were incentivized (3%). The majority of incentivized participants (62%) displayed generous choices. In the hypothetical treatment, egalitarian choices were slightly more frequent than generous choices (48.6 % vs. 48%). The increase of spiteful and generous choices and the decrease of strongly egalitarian choices in the face of low monetary consequences indicate that the elicitation of subjects' true preferences might be complicated when using a hypothetical treatment. Ultimately, generous as well as spiteful choices only make sense/have consequences if (small) monetary rewards are at stake.

Within the context of the existing literature, our results in the incentivized treatment are very much in accordance with the categorization of 16- and 17-year old adolescents presented in Fehr et al. (2011). In their experiment, Fehr et al. (2011) used a comparably higher stake of 6 EUR for this subsample and found that the majority could be categorized as *generous* (60%), while only 26% fell into the *egalitarian* category and 14% in the *spiteful* category. The results presented in Fehr et al. (2011) also confirm the gender effect we observed in our data: while female participants between 16- and 17 years were more frequently categorized as *egalitarian*, male participants turn out to be in the *generous* category more often.

Our results imply that experimental findings for social preferences depend crucially on the underlying earning mechanism; even low stakes are able to systematically change the categorization into different classes of social preferences. The effects of stakes on decision-making have also been reported in a number of other, partly comparable, experimental environments (see Camerer and Hogarth, 1999, for an overview). It would be interesting to see if the categorization of the incentivized treatment changes with the integration of large stakes (Carpenter et al. 2005); however, the results provided by Fehr et al. (2011) suggest that the size of stakes (in absolute and relative terms) must not necessarily lead to systematically different categories.

---

[8] There was only a marginally significant effect ($p = 0.095$) of income in the *weakly generous* category.

According to our results, hypothetical and incentivized decisions reflect fundamentally different situations. Experimenters have to evaluate in which cases intrinsic motivation in hypothetical scenarios vs. motivation caused by monetary rewards are better able to predict real behavior. We do not want to judge whether the psychological perspective (i.e., relying on subjects' intrinsic motivation) or the economic perspective (i.e., incentivizing subjects) leads to more external valid experimental results. Monetary incentives inside (and outside) the experimental lab might crowd out intrinsic motivation (Frey and Oberholzer-Gee, 1997), or they might reveal the true face of a hypothetically nice guy.

REFERENCES

Ai, C. R. & Norton, E. C. (2003). Interaction terms in logit and probit models. *Economics Letters*, 80 (1), 123-129.

Amir, O., Rand D.G., & Gal, Y.K. (2012). Economic games on the internet: The effect of $1 stakes. *PLoS ONE*, 7 (2): e31461. doi:10.1371/journal.pone.0031461.

Bauer, M., Cassar, A., & Chytilova, J. (2011a). Warfare and social preferences in children. Mimeo, University of San Francisco.

Bauer, M., Chytilová, J., & Pertold-Gebicka, B. (2011b). Effects of parental background on other-regarding preferences in children. *CERGE-EI Working Paper Series*, 450.

Ben-Ner, A., Kramer, A., & Levy, O. (2008). Economic and hypothetical dictator game experiments: Incentive effects at the individual level. *Journal of Socio-Economics*, 37 (5), 1775-1784.

Bolton, G.E., Ockenfels, A. (2000). ERC: a theory of equity, reciprocity and competition. *American Economic Review*, 90 (1), 166–193.

Bühren, C. & Kundt, T. C. (forthcoming). Does the level of work effort influence tax evasion?, *Review of Economics*.

Camerer, C. F. & Hogarth, R. M. (1999). The effects of financial incentives in experiments: A review and capital-labor-production framework. *Journal of Risk and Uncertainty*, 19 (1-3), 7–42.

Carlsson, F., Daruvala, D., & Johansson-Stenman, O. (2005). Are people inequality-averse, or just risk-averse? *Economica*, 72 (287), 375-396.

Carpenter, J., Verhoogen, E., & Burks, S. (2005). The effect of stakes in distribution experiments. *Economics Letters*, 86 (3), 393-398.

Charness, G. & Rabin, M., (2002). Understanding social preferences with simple tests. *Quarterly Journal of Economics*, 117 (3), 817–869.

Croson, R. & Gneezy, U. (2009). Gender differences in preferences. *Journal of Economic Literature*, 47 (2), 448-474.

Dana, J., Weber, R. A., & Kuang, J. X. (2007). Exploiting moral wiggle room: experiments demonstrating an illusory preference for fairness. *Economic Theory*, 33 (1), 67-80.

Daruvala, D. (2010). Would the right social preference model please stand up! *Journal of Economic Behavior and Organization*, 73 (2), 199-208.

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

Eckel, C. C., Grossman, P. J. (1996). The relative price of fairness: Gender differences in a punishment game. *Journal of Economic Behavior and Organization*, 30 (2), 143–158.

Fehr, E., Bernhard, H., & Rockenbach, B. (2008). Egalitarianism in young children. *Nature*, 454, 1079–1083. doi:10.1038/nature07155.

Fehr, E., Rützler, D., & Sutter, M. (2011). The development of egalitarianism, altruism, spite and parochialism in childhood and adolescence. *IZA Discussion Paper,* 5530.

Fehr, E. & Schmidt, K.M. (1999). A theory of fairness, competition and cooperation. *Quarterly Journal of Economics*, 114 (3), 817–868.

Fischbacher, U. (2007). z-Tree: Zurich toolbox for ready-made economic experiments. *Experimental Economics*, 10 (2), 171-178.

Fischbacher, U., & Föllmi-Heusi, F. (2013). Lies in disguise—an experimental study on cheating. *Journal of the European Economic Association*, 11 (3), 525-547.

Frey, B. S. & Oberholzer-Gee, F. (1997). The cost of price incentives: an empirical analysis of motivation crowding- out. *American Economic Review*, 87 (4), 746-755.

Holt, C. A. & Laury, S. K. (2002). Risk aversion and incentive effects. *American Economic Review*, 92 (5), 1644-1655.

House, B. R., Henrich, J., Brosnan, S. F., & Silk, J. B. (2012). The ontogeny of human prosociality: behavioral experiments with children aged 3 to 8. *Evolution and Human Behavior*, 33 (4), 291-308.

Kolm, S.G. & Ythier, J. M. (eds.) (2006). *Handbook on the Economics of Giving, Reciprocity, and Altruism*. Amsterdam: Elsevier B.V.

Levitt, S. D. & List, J. A. (2007). What do laboratory experiments measuring social preferences reveal about the real world? *Journal of Economic Perspectives*, 21 (2), 153–174.

Rosenboim, M. & Shavit, T. (2012). Whose money is it anyway? Using prepaid incentives in experimental economics to create a natural environment. *Experimental Economics*, 15 (1), 145-157.

Sefton, M. (1992). Incentives in simple bargaining games. *Journal of Economic Psychology*, 13 (2), 263-276.

Svensson, E. I. (2009). Understanding the egalitarian revolution in human social evolution. *Trends in Ecology & Evolution*, 24 (5), 233-235.

Zaleskiewicz, T. & Hełka, A. (2011). Gender differences in allocation choices made by children aged 5 to 6. *Polish Psychological Bulletin*, 42 (2), 46-51.

Instructions (translated from German)

Incentivized treatment

Part B: Which option do you choose in each case?

In the following three decisions, you determine the **payment of money to yourself and another participant in the experiment**.

One of your decisions will be paid out to you and the other participant in addition to the earnings in the other experiments.

The other participant will be randomly chosen among the remaining participants of the experiment. You and the other participant will remain completely **anonymous**. The other participant will only see **the amount of money you allocate to him**. Likewise, you will see how much money another anonymous participant allocated to **you**.

Please choose **for each case** one of the payout options (A or B):

1) A: You and the other participant both earn 0.50 EUR   □ Option A
    B: You earn 0.50 EUR, and the other participant earns nothing   □ Option B

2) A: You and the other participant both earn 0.50 EUR   □ Option A
    B: You earn 0.50 EUR, and the other participant earns 1.00 EUR   □ Option B

3) A: You and the other participant both earn 0.50 EUR   □ Option A
    B: You earn 1.00 EUR, and the other participant earns nothing   □ Option B

Hypothetical treatment

Part B: Which option do you choose in each case?

In the following three decisions, imagine you could determine the **payment of money to yourself and another participant in the experiment**.

The other participant will be randomly chosen among the remaining participants of the experiment. You and the other participant will remain completely **anonymous**. The other participant will only see **the amount of money you allocate to him**. Likewise, you will see how much money another anonymous participant allocated to **you**.

Please choose **for each case** one of the payout options (A or B):

1) A: You and the other participant both earn 0.50 EUR   □ Option A
    B: You earn 0.50 EUR, and the other participant earns nothing   □ Option B

---

2)	A: You and the other participant both earn 0.50 EUR	□ Option A
	B: You earn 0.50 EUR, and the other participant earns 1.00 EUR	□ Option B
3)	A: You and the other participant both earn 0.50 EUR	□ Option A
	B: You earn 1.00 EUR, and the other participant earns nothing	□ Option B

APPENDIX B

Figure 2: Results of the behavioral subcategories (by gender)