

What is the Effect of Norm Transparency on Solidarity Behavior? Comparative Evidence from a Web-based Interactive Experiment Conducted on Representative Online Citizen Samples in Austria and Germany

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Abstract: Understanding the effects of transparency on compliance with social norms is vital to human cooperation. Transparency is usually regarded as a desirable normative property in democratic decision-making, ignoring that transparency about uncooperative agents can also crowd out good intentions. Therefore, this study tests how transparency about the norm of solidarity within a social group impacts solidarity behavior. It is argued that lacking transparency leads to moderate but stable levels of solidarity, while transparency leads to unstable levels of high or low solidarity. To test these expectations, respondents play the Selten & Ockenfels (1998) solidarity game with ten repetitions in partner-matching with monetary rewards. In the limited transparency conditions, respondents are informed about their payoff and the payoff of their group members. In the full transparency condition, participants are informed about their payoffs and the solidarity behavior of their group members. The control group gets no feedback at all. The web-based interactive experiment is conducted on representative samples from Austria and Germany (N ~ 2,200). Findings of the pre-registered experiment will be presented, and their theoretical implications will be discussed.

Keywords: Solidarity game, web-based interactive experiment, social norm

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1. Motivation

Solidarity among citizens is considered an essential resource of modern democratic societies as the glue that holds societies and polities together. Solidarity fosters a sense of unity and common purpose among citizens, which helps to maintain social cohesion. In this respect, solidarity is a precondition for societal resilience. When facing economic downturns, natural disasters, or public health emergencies, a strong sense of solidarity and cohesion enables democratic societies to respond effectively. Solidarity may not be necessary all the time, but certainly in times of instability and crisis.

Solidarity can be defined as the individual willingness to incur costs in favour of other people. It comes in two variants: social solidarity that materializes between individuals without state intervention and political solidarity where state institutions mediate between individuals by means of public redistribution. It is as such a static concept that describes somebody in a snapshot kind of manner. The concept is agnostic about the motivations for solidarity, be it reciprocity, altruism or selfishness with the expectation of future return.

Understanding solidarity, in its social or political variant, is not only relevant from the vantage point of basic research to understand basic human behavior, it is also of relevance in political economy in order to understand the presence and the potential future of the welfare state. Solidarity towards other members of the same community in a welfare state may be considered a necessary prerequisite for the maintenance of extensive welfare state and the implementation of welfare state reforms (Kumlin and Goerres 2022). It seems thereby most likely that welfare states do not need solidarity by their citizens at all times, but at critical junctures in history, such as wars, pandemics, and grave economic crises. These are these historical episodes during which institutions are built and public demand in form of solidarity is enshrined in new or adapted welfare state institutions. While these multiple benefits of solidarity for democratic societies are well understood, there is little research on how solidarity emerges and can be maintained.

In recent years, scholars in the field of justice research, behavioral economics, and political economy have addressed the question of whether and how, for example, markets (Bowles 2016, Sandel 2012) and societal heterogeneity (Klor & Shayo 2010) undermine or erode social solidarity. This study aims to contribute to this literature by shifting focus on the dynamics of solidarity behavior, i.e. the actual behavioral traces

of social solidarity. In particular, we are interested in why some social groups can maintain high levels of solidarity while others fail. Existing behavioral evidence suggests that respondents' beliefs about other people's adherence to pro-social norms such as cooperation, fairness and reciprocity matter greatly for their behavior (Fischbacher and Gächter 2010). Thus subjects' assumptions about the prevalence of a specific social norm in a group affect their initial choice to adhere to it and act accordingly. In other words, adherence to a social norm is conditional on one's belief about others' adherence.

Existing research on the dynamics of social norms, for example, shows that honest people start to cheat more once they know about the number of "cheaters" in their group (Diekmann et al. 2015, Rauhut 2017, Benistant et al. 2022). Likewise, in public goods games, the willingness to contribute among those who contribute in the first-round declines once they learn about the number of free riders in their group (Fischbacher and Gächter 2010). This study tests the causal effect of transparency about the social norm of solidarity on actual behavior. We expect that the provision of any information about peer players leads, on average, to a decrease in average conditional gifts. In other words, participants who do not know anything about the gifts of other people in their group are expected to give the most, on average. The more they receive information, the more they adjust to lower levels of other people's gifts. In short: people start nice, then they adjust towards giving less.

To test this argument, we rely on an extended version of the solidarity game by Ockenfels & Selten (1998). To test the argument outlined above, we deviate from the original experimental design in two key aspects: First, we let the groups of three players play the game repeatedly for ten rounds in partner matching, enabling players to reciprocate their co-players solidarity behavior. Second, we manipulate the degree of information about their co-players' solidarity behavior in the previous round. This is done to identify information's causal effect on the solidarity norm's salience within the group. The experiment has been programmed in oTree (Chen, Schonger, & Wickens, 2016) and conducted online on representative citizens samples from Austria and Germany in spring 2023.

The study proceeds as follows. The following section presents the theoretical framework from which we derive a set of hypotheses. The third section presents the experimental design, samples, and variables. The experimental results are

summarized in the fourth section. The last section discusses the theoretical and practical implications.

2. Theoretical Framework

2.1. Solidarity as a Conditional Gift

Solidarity by individuals is a central theoretical concept in welfare state research. There is extensive research on the measurement of solidarity and the role of solidarity in political preference formation. Most of this research treats solidarity as an individual attitude or stated preference rather than actual behavior (Goerres 2021; Goerres and Höhne 2023; Höhne and Goerres forthcoming). The solidarity game developed by Selten and Ockenfels (1998) offers the possibility to measure solidary behavior in a generic interdependent decision-making situation. In this game, solidarity is considered as a voluntary compensation to fellow group members if they experience an income loss due to a random adverse event. This definition represents a conceptual clarification compared to other theoretical accounts of solidarity (Mau 2004; Mau and Burkhardt 2009) and simultaneously makes it possible to distinguish the concept of solidarity from other pro-social norms, such as altruism, cooperativeness, or reciprocity.

Studies in Germany

The original solidarity game is a one-shot game played in groups of three players (Selten & Ockenfels, 1998). In the solidarity game, respondents are grouped in groups of three anonymously. Each participant has a chance to win an amount of money with a probability of $2/3$ and win nothing with a probability of $1/3$. Before knowing whether he or she will win or lose, each participant must decide how much to give to one loser (Y_1) in case the three independent draw result in one loser in their group and how much to give to each of two losers (Y_2), in case the three independent draw result in two loser. Similar to Selten & Ockenfels, 1998, Y_1 and Y_2 are referred to as conditional gifts. No conditional gifts will be allocated if the three independent draws lead to no loser. In the other cases, the one loser, or the two losers, will receive the conditional gifts as players agreed before the random draw. Thus, participants must decide whether they are committed to providing a gift to those worse off after the random draw than themselves without knowing the commitment of their co-players.

The game-theoretical solution, which rests on the assumption of fully rational and self-interested players, predicts Y_1 and Y_2 to be zero. Previous studies testing the

empirical validity of this prediction, primarily relying on laboratory experiments with monetary rewards, provide limited support. In contrast, Selten and Ockenfels (1998) and follow-up studies find that gifts (Y_1 and Y_2) are between approximately 10%-30 % on average and thus consistently larger than zero (see Table 1). The one-shot solidarity game has been replicated in laboratory studies (Brosig-Koch et al., 2011; Büchner et al., 2007; Trhal & Radermacher, 2009) and as a laboratory-in-the-field experiment (Oliveira et al., 2014). The most prevalent type of behavior observed is to fix the total sacrifice, e.g., to give the same total amount of conditional gifts ($Y_1 = 2 \times Y_2 > 0$), which does not lend itself to a simple utility maximization function.

Table 1: Solidarity Game *Studies in Germany*

Study	Selten & Ockenfels, (1998)	Ockenfels & Weimann, (1999)	Büchner et al. (2007)	Trhal & Radermacher, (2009)	Brosig-Koch et al. (2011)	Brosig-Koch et al. (2011)
Study year	1994 / 1995	1994 / 1995	<= 2003	2005	2009	2009
Sample size	120	60	30	24	54	53
Study location	West Germany	East Germany	East Germany	West Germany	West Germany	East Germany
Mode	Paper & Pencil	Paper & Pencil	Paper & Pencil	Paper & Pencil	Paper & Pencil	Paper & Pencil
\bar{Y}_1	0.246	0.162	0.139	0.127	0.226	0.095
\bar{Y}_2	0.156	0.101	0.096	0.090	0.141	0.066
EB	0.21	N/A	0.27	0.458	N/A	N/A
FTS	0.36	N/A	0.20	0.166	N/A	N/A
FTS up to rounding	0.16	N/A	0.23	N/A	N/A	N/A
FGTL	0.16	N/A	0.13	0.125	N/A	N/A
IB	0.11	N/A	0.07	0.125	N/A	N/A
IEB	0	N/A	0.10	0.125	N/A	N/A

Note: \bar{Y}_1 : Conditional gift to one loser. \bar{Y}_2 : Conditional gift to each of the two losers. Types of behavior: EB: Egoistical Behaviour, FTS: Fixed Total sacrifice, FGTL: Fixed gift to loser, IB: Intermediate behavior, IEB: inconsistent egoistical behavior.

Studies in other countries

In a lab-in-the-field solidarity game conducted with low-income participants in Dallas, Texas, participants showed less egoistical and more fixed-gift-to-loser behavioral types. On average, participants gave 1.2 % more of their endowment to one loser and 19.5 % more to two losers than observed by Selten and Ockenfels (1998). The study found that giving was positively associated with participants' age, income and community integration, while trust and empathy showed no relation with giving (Oliveira et al. 2014).

A lab-in-the-field experiment, based on the solidarity game and conducted with school children in Bogota, Colombia, employed a real effort task in which participants earned a payoff and afterwards faced the risk of losing their earned incentive with a probability of 1/3. This game was repeated over four rounds, and the children participated again one and two years after the first experiment. The research found that the children became more altruistic between 9 – 11 years, and that norms of

cooperation and reported altruistic behaviour in the child's social network were positively associated with giving (Kromer 2020).

A modified version of the solidarity game with four players and a fixed number of two winners was conducted on an ethnically diverse market in the Netherlands. Participants were informed of their interaction partners' sex, age, ethnicity and residency in the neighbourhood. The research found that giving was highest with a moderate age difference (of 18.5 years) and moderate level of ethnic diversity (Beer and Berg 2012).

In another modified two-player solidarity study conducted in the Netherlands, both players won with a chance of 50 %, no player with a 10 % chance, and each one of the players with a 20 % chance. Participants learned about their cooperation partners' age and showed in-group bias toward their own age group. Interestingly, participants expected lower gifts than they received. Additionally, women and higher educated participants gave larger gifts, though effect sizes were weak (Riedl et al. 2019).

2.2. Reciprocal Solidarity

In their seminal study, Selten and Ockenfels (1998: 518) discuss the relationship between solidarity and reciprocity. Specifically, they say: "To some extent, solidarity is similar to reciprocity, a motivation which urges you to give something in exchange for something you have received, even if you are not compelled to give anything." Next, they carve out the difference between solidarity and reciprocity by saying that solidarity in terms of conditional gifts "are made to recipients who presumably, if one were in need oneself, would have made a gift to oneself" and conclude that solidarity "aims at a reciprocal relationship, but a more subtle one than giving after one has received." We take these ideas as the starting point to explicitly theorize and empirically test the interplay between solidarity and reciprocity. In reality, the conceptual separation between solidarity, as a one-time act of a conditional gift, and reciprocity is not convincing. Instead, it seems to be common that those who behave in solidarity expect solidary behavior in return; if this is not possible, their solidarity is conditional on the recipients deserving.

In real life, there are multiple examples, ranging from COVID-19 vaccination to the allocation of asylum seekers within the European Union, where solidarity is closely coupled with the expectation of reciprocity. Or as Selten and Ockenfels (1998: 518)

put it: “Solidarity aims at a reciprocal relationship, but a more subtle one than giving after one has received.” In this study, subjects repeatedly play the solidary game within the same group, allowing for “giving after one has received”. This design enables us to investigate how reciprocity affects the emergence and maintenance of solidarity, measured as a conditional gift (for the role of information in redistribution behavior see Paetzel et al. 2018).

In addition to repeated interaction, the reliability of information about the behavior of other group members is another prerequisite for reciprocity. We argue that the emergence of reciprocity in the repeated solidarity game depends on the unambiguity and reliability of information about the behavior of the other group members in the preliminary round. Thus, players must be able to “keep records” of the conditional gifts promised or received to react accordingly. Therefore, we distinguish three conditions: a decision situation in which respondents are fully informed about the conditional gift or their co-players regardless of whether they did or did not receive the gift, a situation in which they are only informed about the conditional gift when losses occurred and a situation in which the repeated solidarity game in which there is no feedback about the co-players conditional gift. The game-theoretical solution in the repeated solidarity game with and without any information remains the same as in the one-shot game; Y_1 and Y_2 is predicted to be zero.

Reciprocity is an in-kind response to friendly or hostile acts (Dohmen et al. 2009: 592) (Gouldner 1960) Multiple experimental studies have proven the importance of reciprocity for the emergence and maintenance of social norms of cooperation (Gintis et al 2003, Fehr 2004, Carpenter et al. 2009).

2.3. Unconditional solidarity

We can juxtapose the idea of conditional solidarity with that of unconditional solidarity. Political sociology and political psychology research have demonstrated that people are willing to give unconditionally based on deservingness considerations. These deservingness considerations favor certain groups because they fulfil unequivocally deservingness criteria. For instance, children are considered to be fully deserving across Europe and trigger solidarity behavior (van Oorschot 2006). The underlying attribution is thereby that children cannot be responsible for their situation, so that their misfortune triggers more willingness to help than that of other groups, such as the unemployed that are constructed to makers of their own fate.

2.4. Derived Hypotheses

Based on these strands of literature, we propose the following pre-registered Hypotheses (<https://doi.org/10.17605/OSF.IO/P672Y>): **H1.** The provision of any information about peer players leads, on average, to a decrease in average conditional gifts. In other words, participants who do not know anything about the gifts of other people in their group are expected to give the most, on average. The more they receive information, the more they adjust to lower levels of other people's gifts. **H2.** The means of the variance of the ACG per round is largest in the no-information group, lowest in the full information group, and in the middle thereof in the limited information group. This is because people receive more signals in the limited and full information group that are used to adjust. This adjustment should lead to lower overall heterogeneity in conditional gift behaviour.

3. Research Design

3.1. The Experimental Vehicle and Treatment Conditions

Participants are paired into groups of three and play the solidarity game. Before the game, respondents receive detailed on-screen instructions, including a set of comprehension questions. Subjects are told that they can win experimental tokens equivalent to 100 Eurocents in each round. Next, they are asked how much they would give in the case that they won and there was one loser ($Y_{1,t}$) and how much they would give in the case that they won and there were two losers ($Y_{2,t}$). The solidarity game is played for ten rounds in each condition. $Y_{1,t}$ refers to participants' conditional gift in the case of one loser in the group, and $Y_{2,t}$ refers to participants' conditional gift in the case of two losers. t refers to the round $[1, \dots, 10]$. As a proxy, we use the Average Conditional Gift of each round defined as the probability-weighted $ACG_t = (0.296 * Y_{1,t} + 0.074 * 2 * Y_{2,t}) / 0.37$. The ACG_t across all ten rounds is the primary target outcome. The mean of variances in each round t is the second outcome.

There are three experimental conditions: (1) *No information*: Participants play ten rounds with no information about their luck or bad luck and the conditional gift of their co-players. After the tenth round, subjects are informed about their luck or bad luck and their payoffs for each round. (2) *Limited information*: Participants play ten rounds with information about their luck or bad luck and their payoffs after each round. Participants receive information about the realized gifts from the other group members

in case the participant does not win. (3) *Full information*: participants play ten rounds with full information about their luck or bad luck, their payoffs, the conditional gifts of the other participants in their group, and the payoffs of the other participants. At the end of the game, one out of ten periods is randomly selected. The payoff in the selected round determines the final payoff in Euro transferred to the participant.

3.2. Online Samples

The experiment was programmed in oTree (Chen, Schonger, & Wickens, 2016) and conducted as an interactive online experiment. We simultaneously recruit 1000 participants in DE and in AT and expect 800 participants as full completes per country. The samples are bought from a provider of online access panels. An effect size of Cohen's f of .15 in a simple Anova with three groups needs a sample size of 690, according to GPower 3.1.9.7 (Faul, Erdfelder, Lang, & Buchner, 2007). We only use participants who have finished all ten rounds. Subjects who dropped out by themselves or were assigned to a group with drop-outs could not finish the experiment.

Data collection took place simultaneously in Austria and Germany across six data collection windows between 22 February and 8 March 2023. Participants were recruited via the German and Austrian online panels of respondi & Bilendi. Volunteers were invited to participate by the online sample provider immediately before the opening of the data collection windows. We used quota sampling based on the latest available census data, with a combined quota for gender and age and an independent quota for education level. The quotas were reached for most sociodemographic groups, though young respondents are slightly underrepresented in Germany and low educated respondents are slightly underrepresented in both surveyed countries.

The data collection on 22 February 2023 was open for participation from 5 to 8 pm. Because the participation rate and thus the likelihood of successfully matching participants was lower than estimated by the online sample provider, we reduced the participation time to 6 to 8 pm for the remaining data collection period. On 1 March 2023, an error in the online sample provider's system prevented the participation of German respondents between 6 and 7:05 pm. Due to this error, we exclude data collected in Germany on 1 March 2023. This only affects the data for Germany, as participants in the solidarity game only interacted with participants within their own panel country.

Table 2: Sample characteristics in Austria and Germany

	Austria	Germany
N	1052	1183
Age (Median in years)	52	56
Female (%)	47.8	48.6
Education (%)		
ISCED 2 and lower	2.3	36.4
Up to ISCED 3B	58.5	26.7
ISCED 3A and higher	39.2	35.0
Education (%)		
With Matura / Abitur (General university entrance qualification)	38.8	27.1
Income (Median in €)	1,900	1,600

Legend: Statistics and units in parentheses (if applicable). Implausible values erased.

Participants first answered a short questionnaire involving age, gender and education level via the online panel provider. If the quota for the participant's sociodemographic group had not been met, participants were directed to the oTree experiment. They then read the instructions for the solidarity game, answered three comprehension questions, and were matched with two other participants. Participants were informed that they would partake in the solidarity game with the same group over ten rounds. Regardless of the participant's treatment group, a table with the payoff in each round and their total payoff was shown after the ten rounds were completed. Participants then answered a questionnaire on further sociodemographic characteristics and attitudes. Finally, participants returned to the online sample provider and received their payoff in the subsequent days.

3.3. Statistical Analysis

H1 deals with differences in means of means between the three groups. We will first create the overall mean of Average Conditional Gifts across all ten rounds per individual. Then we will conduct a simple ANOVA to compare the means across the three groups. We will then conduct pairwise comparisons between the three groups. H2 is about the pairwise comparisons of the means of variance of the ACG across ten

rounds between the two information groups (limited and full) to test for the homogeneity of variances in the two groups (e.g., Bartlett's test or Levene's test).

3.4. Pregistration, Data Protection and Research Ethics

Our main hypotheses and research design were preregistered and time-stamped in the Open Science Framework. Data handling was discussed with the Data Protection Officer of the University of Duisburg-Essen. The received ethics clearing from the research ethics committee for social psychology responsible for the ethics clearance of the whole project. We only receive anonymized data with no possibility of de-identifying the individuals. There is no deception. Individuals can always withdraw from the data collection and gave informed consent. Given that there is no direct control of the volunteers, we cannot rule out that people self-identity as younger than 18 or are not of stable mind to give informed consent. However, given that all volunteers are registered with the provider, we deem the chance of the former at the least as very low.

4. Empirical Results

4.1. Baseline Effects

Figure 1 presents the average gift in the case of one loser, two losers and the total average gift across the three treatment conditions. Figure 1 shows that, although the conditional gift, differs significantly if respondents consider to compensate one or two loser (green vs. blue), the mean conditional gifts do not differ across treatments.

Figure 1. Mean conditional gifts by treatment

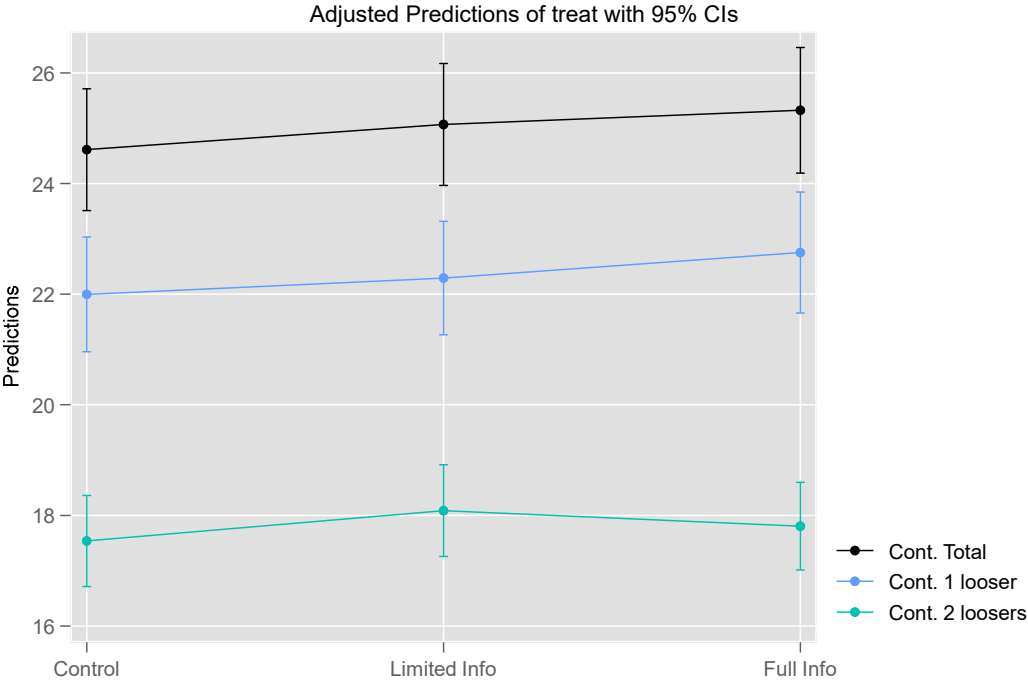
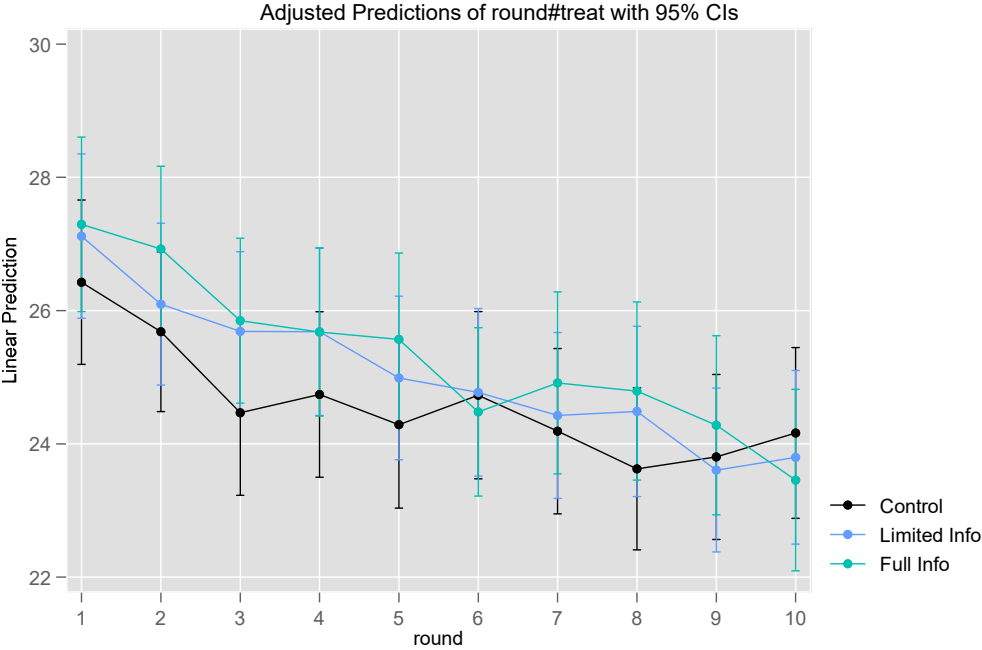


Figure 2 shows the total average conditional gift by treatment condition across the ten rounds. Again, the confidence intervals of the means are largely overlapping, indicating the absence of a clear treatment effect. What is more there is a clear trend as the total average conditional gift declines across rounds. The pattern reminds of the decreasing contribution rate over time in the public good game. In the public good game, with partner-matching and without punishment, the willingness to contribute to the public good decreases as soon as the other players observe free-riding behavior of a group member. In the repeated solidarity game, free-riding is not possible as in the public goods game, since the payoffs are determined not only by the conditional gift of the other players but also by chance. Since the decline in solidarity occurs in all three treatment conditions, it is possible that players in the first round underestimate the chance of winning and overestimate the chance of losing.

Figure 2. Mean conditional gifts by treatment and round



4.2. Regression analysis

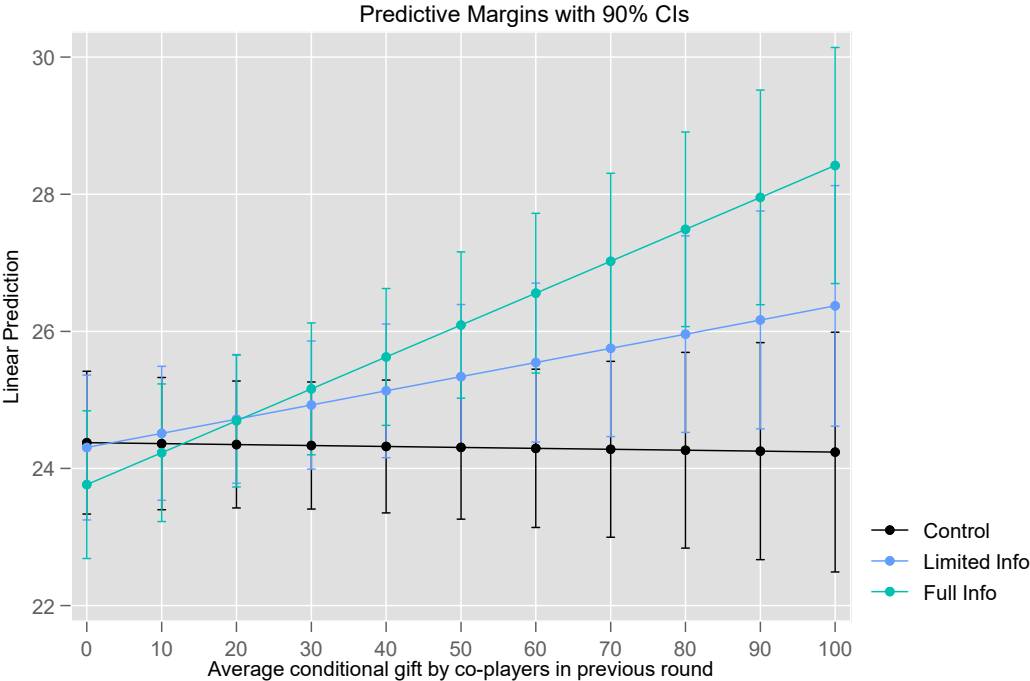
The next step is to take a closer look at the role of information on the size of the conditional gifts conditional on the behavior of co-players. To do so we estimate a series of random effects model including the lagged average total gift of the two co-player. Figure 3 shows that higher conditional gifts by co-players in the previous round are reciporated in the next round. However, this effect occurs only in the limited and full information treatment, indicate evidence for reciprocal solidarity.

Table 1. Panel regression (random effects models)

	Model 1	Model 2	Model 3	Model 4
	Total player contribution	Contri. 1 loser	Contri. 2 loser	Total player contribution
Treatment				
Limited Info	0.465	0.325	0.510	-0.0842
	[0.80]	[0.75]	[0.60]	[0.97]
Full Info	0.543	0.596	0.160	-0.654
	[0.81]	[0.77]	[0.59]	[0.97]
Co-Player' choices				
Lagged av. Contribution co-players	0.0218**	0.0181*	0.0233***	-0.00185
	[0.01]	[0.01]	[0.01]	[0.01]
Individual Controls				
Female	-1.596**	-1.425**	-1.136**	-1.615**
	[0.67]	[0.63]	[0.49]	[0.67]
Middle age group (1963-1982)	0.0684	-0.227	0.621	0.0699
	[0.87]	[0.83]	[0.62]	[0.87]
Elderly (-1962)	1.456*	1.067	1.505**	1.427*
	[0.86]	[0.83]	[0.61]	[0.86]
Left/right - Political left/right scale	-0.766***	-0.738***	-0.442***	-0.766***
	[0.18]	[0.17]	[0.14]	[0.18]
All Comprehension questions correct Yes/No=1	-0.896	-0.428	-1.388***	-0.900
	[0.65]	[0.61]	[0.48]	[0.65]
Interaction Terms				
Limited Info # Lagged av. Contribution co-players				0.0223
				[0.02]
Full Info # Lagged av. Contribution co-players				0.0477**
				[0.02]
Constant	30.13***	27.02***	21.15***	30.73***
	[1.50]	[1.41]	[1.11]	[1.52]
Observations	19971	19971	19971	19971
R2 within	0.00796	0.00414	0.0145	0.00822
R2 overall	0.0178	0.0153	0.0211	0.0193
R2 between	0.0205	0.0186	0.0234	0.0222

Note: Standard errors in brackets, * p<0.10 ** p<0.05 *** p<0.01.

Figure 3. Effect of the lagged average total gift of co-player conditioned by treatment



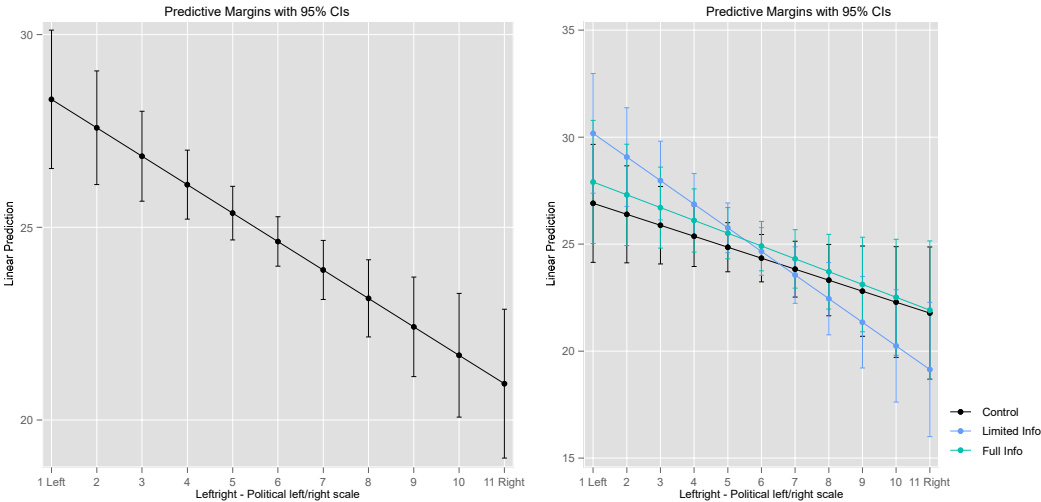
4.3. Additional analysis

In an auxiliary analysis we explore the role of respondents self-reported ideological orientation on solidarity behavior. Political ideology has traditionally been conceptualized on a left-right spectrum, where the left represents a desire for greater equality and poverty reduction, while right-wing perspectives are associated with promoting individual responsibility and economic freedom (Mair, 2007; Bobbio, 1996). Although there is substantial survey-based evidence linking self-reported left-leaning orientations with positive views on the welfare state (Jaeger, 2008, p. 363), there are fewer experimental studies investigating the behavioral outcomes of ideological orientations. Esarey, Salmon, and Barrilleaux (2012b) demonstrate that support for redistributive taxes aligns primarily with self-interest rather than partisan ideology (also see Esarey, Salmon, and Barrilleaux, 2012a). Similarly, Barber, Beramendi, and Wibbels (2013) find that self-reported party affiliation does not predict voting on a redistributive tax rate. These findings are perplexing given the overwhelming evidence from survey-based research linking self-reported ideological orientation with support for welfare policies (e.g., Scheepers and Grotenhuis, 2005; Jaeger, 2006). This article builds on the notion that individuals' self-reported ideological orientation encompasses certain fundamental assumptions about justice. To the best of our knowledge, the impact of ideological left-right orientation on solidarity has not been thoroughly

investigated. Consequently, we would anticipate that individuals identifying as left-leaning are more likely to exhibit higher levels of solidarity compared to those positioning themselves further to the right on the ideological spectrum.

The regression analysis summarized in Table 3 and Figure 4 supports this expectation, as more right leaning respondents offer lower conditional gifts resp. show less solidarity. This robust relationship is not affected by the treatment condition which indicates that the self-reported left right orientation taps on deeply beliefs about social justice.

Figure 4. Effect of self-reported ideological orientation



5. Our Contributions

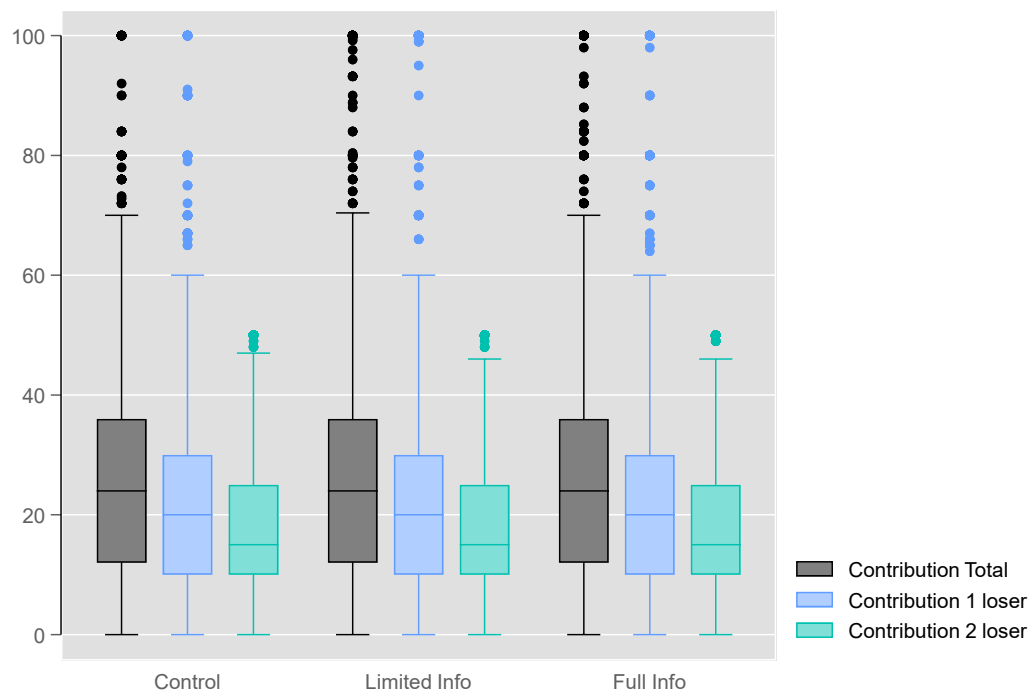
Understanding the effects of transparency on compliance with social norms is vital to human cooperation. Transparency is usually regarded as a desirable normative property in democratic decision-making, ignoring that transparency about uncooperative agents can also crowd out good intentions. Therefore, this study tests how transparency about the norm of solidarity within a social group impacts solidarity behavior. It is argued that lacking transparency leads to moderate but stable levels of solidarity, while transparency leads to unstable levels of high or low solidarity. Solidarity behavior is dynamic. People adjust it towards what other people do. This implies spirals to the top or to the bottom, depending on which trajectory a group of three started. The mean average conditional gift can increase across time in a group because generosity breeds generosity, or it can decrease across time as stinginess breeds stinginess. How

people start in the first round, thus becomes a separate issue from how people give dynamically. The latter is a function of the group composition.

Our analysis also yields who starts high or low. Those on the political left, with higher social trust, women, and older people are more likely to start high. These findings have important implications of welfare state research. They mean that people on different sides of the political spectrum can make each other more or less solidary, depending on whom people interact with. Given the high level of residential segregation in some contexts, the dynamics of solidarity behaviour can explain the homogenization of local provisions of help and public redistribution. This micro-level mechanism can be linked to macro-level analyses of affective polarization and residential segregation.

6. Online Appendix

Appendix Figure 1. Distribution of conditional gifts by treatment



7. References

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