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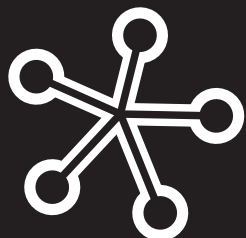


Solidarity in the 21st century POPULATION AGEING, IMMIGRATION AND SOLIDARITY

Solidarity in a multicultural neighbourhood

Results of a field experiment

Paul de Beer and Maarten Berg

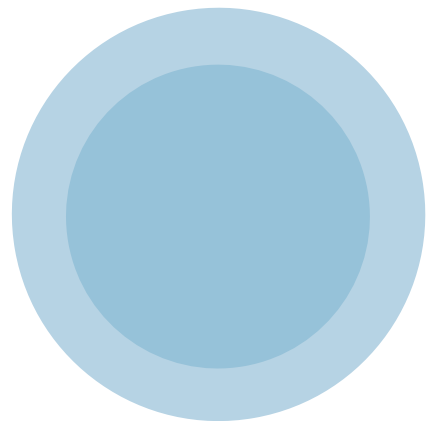
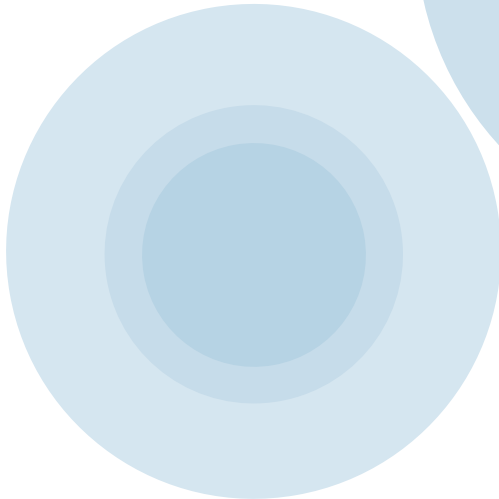
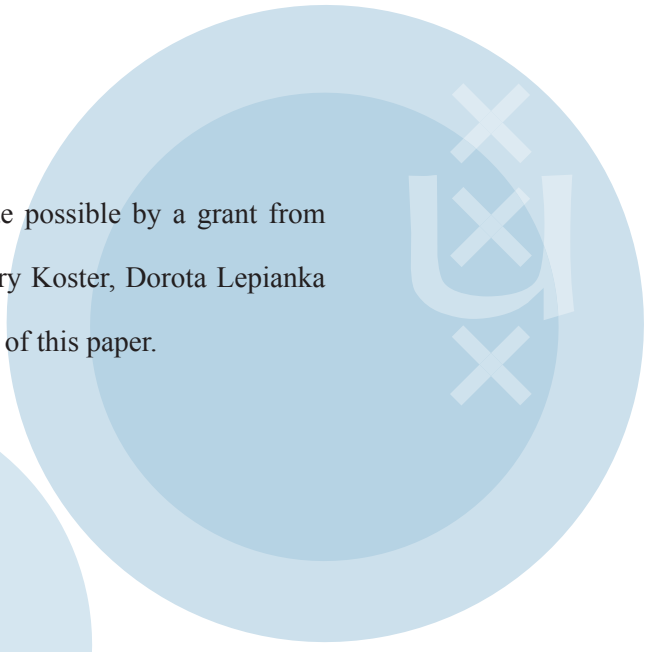


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Results of a field experiment

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WP 125

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On the series ‘Solidarity in the 21st Century’

The research programme ‘Solidarity in the 21st Century’ of the Amsterdam Institute for Advanced Labour Studies focuses on the effects of changes in the composition of the population due to immigration and ageing on the public support for social solidarity. It is often claimed that increasing diversity of the population erodes solidarity, because people do not recognize other people who differ in some important characteristics from themselves, as members of their own community. However, there are only few studies that have attempted to test directly the relationship between diversity and solidarity.

This research program aims to analyse the effects of the changing composition of populations on both informal and formal solidarity. It examines which motives, conditions and circumstances are beneficial or detrimental for sustaining solidarity within and between different groups in society. The apparent discrepancies between immigrants and natives on the one hand, and the elderly and the young on the other hand, may seriously affect the willingness of citizens to support or help fellow citizens who belong to a different ethnic group or age category. Members of various groups may find it difficult to relate to each other, and fears that one group will benefit unequally from the other may grow.

By combining different research methods – qualitative case studies, statistical analyses of large scale surveys, laboratory experiments, media content analysis – this research project investigates the different conditions and motives for solidarity. The focus of the research is on solidarity between immigrants and natives, and between the elderly and the young. Solidarity is defined broadly as any act that purposefully benefits another person at a cost for the agent, without any guarantee of an equivalent return. Some examples of solidarity are alms-giving to a beggar, helping your neighbour, voluntary community work, donating money to a charity organization, paying an insurance premium and paying taxes.

The research programme ‘Solidarity in the 21st Century’ includes statistical analyses of cross-country surveys, qualitative field studies in several neighbourhoods that differ in composition, laboratory experiments of a solidarity game and a content analysis of the representation of different groups (old, young, allochthones) in mass media. The (provisional) results of most of these studies will be published in the AIAS Working Paper series.

The research programme is made possible by a grant from Stichting Instituut Gak.

For further information on the research programme ‘Solidarity in the 21st Century’ see the programme’s website www.solidariteit.info.

Abstract

This paper investigates the effect of differences in sex, age, ethnicity and residency on the willingness of individuals to share money with others in a solidarity game. The solidarity game that was used in this study consists of groups of four players and has similarities with the well-known ‘dictator game’. The dictator role was either randomly assigned (random conditions) or earned by performing well on a quiz (performance conditions). In each group, two ‘dictators’ could distribute 20 credits (reflecting real money). Contrary to most experimental games, this experiment was carried out both with university students in a laboratory at the University of Amsterdam and with ‘ordinary’ people who visited the Dapper market in a multicultural Amsterdam neighbourhood as subjects. This working paper reports on the latter case. Since the players were informed about the age, the sex, the cultural background and the number of years of residency in the Dapper area of their co-players, we can examine the effect of a difference between two players and of heterogeneity of the group. Thus we test the thesis of Robert Putnam (2007) that ethnic diversity of a group harms both out-group and in-group solidarity.

A difference in cultural background between two players appears to have a significantly negative impact on the gift they bestow each other. Natives discriminate against co-players with a Turkish, Moroccan or European background, but not against Surinamese co-players. Surinamese players and players with an ‘other’ cultural background also demonstrated a bias in favour of players of their own or each other’s group compared to natives, Turks, Moroccan and European players.

We also found an effect of the ethnic composition of groups on giving, but there is no straightforward relationship between ethnic diversity and the size of gifts. In general, gifts are largest in groups with either three natives or three non-natives, due to intra-ethnic favouritism within these groups. In case of an equal number of natives and non-natives within a group, however, there is little evidence for intra-ethnic favouritism or discrimination against the other ethnic group. Remarkably, we found a similar effect with respect to the diversity of residency within the group, i.e. the number of players who live in the Dapper neighbourhood.

Regarding age, both the age of the players and the age difference between the players matters. Up till the age of 50, the size of gifts rises with the age of the player, and gifts are the largest when the players differ about 18.5 years in age, irrespective of who is older and who is younger. Consequently, solidarity seems to be stimulated by a substantial but not too large age difference.

Finally, we also examine the relationship between media use and political party preferences on the one hand and gift giving on the other.

1. Introduction

It is often claimed that (voluntary) solidarity and sharing behaviour may erode as a consequence of growing ethnic or cultural diversity of societies¹. In general, people are supposed to be less willing to support or help people who belong to a different ethnic group than to members of their own group. However, Putnam (2007) has claimed that ethnic diversity may also hurt within-group solidarity, i.e. solidarity between members of the same ethnic group. In this paper we test whether group diversity harms solidarity by conducting a field experiment with ‘ordinary’ citizens, who differ in various characteristics, including their ethnic background. Our experiment allows us to test the impact of differences in ethnic background between two participants as well as the impact of the diversity of the group in which they participate on solidarity between two participants. Thus, we are able to test whether group diversity has an independent and different effect on solidarity than the differences between individuals.

1.1. The solidarity game

The accompanying AIAS Working paper ‘Conditions and motives for voluntary sharing.

Results of a solidarity game experiment’ (de Beer and Berg 2012) gives a brief introduction to game theory and the experiments that have been carried out. Readers who are not familiar with these subjects are referred to this paper. In the present paper, we confine ourselves to a description of the solidarity game that was carried out in the Dapper area, a multicultural neighbourhood in Amsterdam.

This game is a variant of the original solidarity game, as introduced by Selten and Ockenfels (1998). Our variant allows us to study four types of conditions (mentioned below) which may affect voluntary solidarity. Our solidarity game is in several respects an extension of the Selten and Ockenfels game. First, the groups consist of four players rather than three, and there are always two winners and two losers. This enables us to study solidarity both from an intergroup perspective (solidarity between winners and losers) and an intragroup perspective (solidarity among winners). The behaviour of a winner cannot only be influenced by her/his own norms and by her/his perception of the losers, but also by the behaviour of the other winner. Secondly, the dictator role was not always assigned randomly, but in half of the experimental conditions the two players who performed the best on a general knowledge quiz were appointed as winners. This quiz functions as a way to model the role of performance (related to intelligence and earning capacity) in the real

¹ We use the terms ‘ethnic’ and ‘cultural’ interchangeably in this paper to refer to a ‘foreign’ decent of a subject.

world. Thirdly, in half of the conditions, the game was played for four consecutive rounds (with the same players) rather than one. Finally, we informed the participants in the game about some characteristics of their co-players, so that we can test whether the willingness to share with other players depends on the characteristics of the other player or of the group as a whole. In this way, we examine to what extent diversity of a group affects solidary behaviour.

1.2. Main question and hypotheses

Although we first analyse the effects of the conditions and the outcome of the game on the sharing between players, our main interest in this paper is to what extent differences in characteristics between the players and the diversity of a group affects the willingness to share with each other within the group

In a much cited and discussed article, ‘E pluribus unum’, Robert Putnam (2007) claims that “immigration and ethnic diversity tend to reduce social solidarity and social capital.” More specifically, “in ethnically diverse neighbourhoods residents of all races tend to ‘hunker down’. Trust (even of one’s own race) is lower, altruism and community cooperation rarer, friends fewer.” Other scholars have tried to replicate Putnam’s study of American neighbourhoods in other geographical areas, such as Dutch neighbourhoods (Dronkers & Lancee 2008) and 28 European countries (Gesthuizen, Van der Meer & Scheepers 2008). Some of these follow-up studies support Putnam’s results (Dronkers & Lancee), while others refute them (Gesthuizen et al.). A common element of these studies is that they focus on trust in other people as the main indicator for social solidarity or social capital. It is then often assumed, but seldom tested, that a lower trust in other people will result in less pro-social behaviour, such as helping neighbours or contributing to voluntary work. Since our experiment allows us to observe actual behaviour of participants in which real money is at stake, it offers valuable additional information on the influence of diversity on solidarity. Moreover, since the choice of the neighbourhood in which one lives is, at least to some extent, voluntary, the differences that are observed between the residents of different neighbourhoods may partly be caused by self-selection. People living in ethnically diverse neighbourhoods may differ in some unobserved characteristics from people living in homogeneous neighbourhoods. Thus, it is difficult to establish whether the causal effect runs from the composition of the neighbourhood to individual attitudes and behaviour or in the opposite direction. Since the participants in our experiment were assigned quasi-randomly to groups that differ in heterogeneity, there is no ambiguity about the direction of the causal relationship.

Putnam discusses two theories that may explain why there is less social solidarity or social capital in ethnically diverse communities. According to the conflict theory, members from different (ethnic) groups compete for scarce resources and have, consequently, conflicting interests. Thus, members from different groups will trust each other less than members from the same group and, as a result, general trust will be less in a diverse community. However, in this theory it is assumed that in-group trust is not (negatively) affected by diversity or may actually be strengthened by the negative attitudes towards the out-group.

As opposed to this theory, Putnam proposes the constrict theory, which states that ethnic diversity may also erode in-group trust. In an ethnically diverse setting, people may ‘hunker down’ or ‘pull in like a turtle’ (Putnam 2007: 149), which means that they also trust member of their own group less than in an ethnically homogenous setting.

With our experiment in the Dapper area we are able to test both the conflict theory and the constrict theory from a new angle. First, if the conflict theory is correct, we expect less solidarity between participants who belong to different ethnic groups than between participants of the same ethnic group (hypothesis 1). However, this hypothesis is not necessarily inconsistent with the constrict theory. Consequently, if this hypothesis is confirmed, this would offer support for the conflict theory, but it would not prove that the constrict theory is wrong. Conversely, if this hypothesis is rejected, this would be strong evidence against the conflict theory, but not against the constrict theory.

Secondly, we test the effect of group diversity on solidarity. According to the constrict theory, solidarity will be lower in an ethnically diverse community than in a homogenous community, since diversity will result in less solidarity between (ethnic) groups as well as within groups (hypothesis 2). If this theory is confirmed, this would support the constrict theory, but it would not be inconsistent with the conflict theory. However, if the hypothesis is rejected, this would refute the constrict theory, but not necessarily the conflict theory, since group diversity might strengthen intra-group solidarity and, accordingly, need not harm total solidarity.

Thus, hypotheses 1 and 2 can only provide evidence against one of the two theories, but they cannot prove which theory is correct.

Therefore, we will test a third hypothesis which clearly distinguishes between both theories. This hypothesis states that there is a negative interaction effect between group diversity and solidarity between two individual players. If the conflict theory is correct, we expect a negative effect of group diversity only on solidarity between players from different ethnic groups (hypothesis 3). If the constrict theory is correct, there will also be a negative interaction effect between group diversity and solidarity between players from

the same ethnic group. Put differently, according to the conflict theory, group diversity will result in discrimination against subjects with another (ethnic or cultural) background, while the constrict theory claims that group diversity will result in less overall solidarity, but not specifically because of discrimination against subjects with another background.

In addition to the many studies on ethnic diversity, we also test whether other kinds of diversity have similar effects. A priori, it is not self-evident that ethnic diversity has a different effect than, for example, gender diversity or age diversity. Therefore, we will study the possible consequences of these other kinds of diversity simultaneously with ethnic diversity.

Thus, the hypothesis we will test are the following.

Hypothesis 1 (conflict theory): a player shares less with a co-player who differs from her/him in various characteristics than with a co-player who has similar characteristics.

Hypothesis 2 (constrict theory): the larger the diversity of a group, the less players share with each other.

Hypothesis 3 (conflict versus constrict theory): the larger the diversity of a group, the less a player shares with a co-player who differs from her/him in various characteristics.

2. Method

2.1. Participants

In the second phase of our experiment (the first phase was conducted with students of the University of Amsterdam), 180 visitors of the Dapper market were recruited for immediate participation. All participants received 7 euros for the one shot game and 10 euros for the four shots game (because it took more of their time) as a show-up fee. On top of that, each group of four players earned 40 additional euros. The average player earned 17 euros (including the show up fee) in the one shot game and 20 euros in the four shots game, but actual earnings varied between players and depended on performance, chance and/or the sharing behaviour of the various group members.

Table 1 shows some background characteristics of the participants. Taking the population of Amsterdam as a reference point,² there is a large overrepresentation of women in our sample. For the other variables, the discrepancy between our sample and the actual population is smaller. Compared to visitors from other neighbourhoods, subjects living in the Dapper-area were dominantly (even more) left-wing oriented.

Table 1. Distribution of subject characteristics

Sex	Males (n=52) 28.9%	Females (n=128) 71.1%				
Ethnical background	Natives (n=122) 67.8%	Non-natives (n=58) 22.2%				
Age	16-19 (n=12) 6.7%	20-29 (n=34) 18.9%	30-39 (n=24) 13.3%	40-49 (n=35) 19.4%	50-59 (n=41) 22.8%	>= 60 (n=34) 18.9%
Political orientation	Left ³ (n=99) 78.0%	Right (n=28) 22.0%	Missing (n=53)			
Marital status	Married (n=42) 23.3%	Cohabiting (n=25) 13.9%	LAT (n=12) 6.7%	Single (n=101) 56.1%		
Neighbourhood	From Dapper area (n=73)	Not from Dapper area (n=107)				

2 However, one should recognize that visitors to the Dapper market need not be residents of Amsterdam.

3 People were categorized as 'left' if they voted PvdA, SP, GL, D66, Partij voor de Dieren, or CU during the last election, and as 'right' if they voted VVD, CDA, PVV or SGP.

2.2. Procedure

A field laboratory was created close to the Dapper market in Amsterdam. There were eight connected computers, making it possible for two groups of four to play the ‘solidarity game’ simultaneously. Cabins were created to replicate the (anonymous) conditions of the first phase of the experiment in the laboratory as good as possible, although it was not feasible to completely meet these standards. This was not really problematic when two groups were playing simultaneously (creating confusion about the other members in the groups), but somewhat more problematic when only one group was playing.

After entering the experimental room and sitting behind their own computer, the subjects were asked some questions to generate a profile for each player, consisting of information about the players’ ethnical identity, age, sex, marital status and the number of years s/he had been living in the Dapper area. This information about all fellow players was visible on the computer during the distribution phases of the experiment.

Next, the subjects received further instructions about the experiment. They were told that they would have to participate in a general knowledge quiz (history, science, music, sports, etc.), consisting of ten multiple (four) choice questions. In the second phase, subjects had to indicate how many correct answers (0-10) they expected to have. Also they had to estimate the average number of correct answers of their fellow three players

In the third phase, subjects had to indicate how much they would be willing to share (of 20 credits) if they would hypothetically (not yet knowing the scores on the quiz) belong to the two winners. In total, 40 credits were shared (20 credits by each winner). The subjects were told that any distribution was allowed. They could keep all 20 credits to themselves, give everything away, discriminate between the other players or treat the other players the same. They were also told that the credits reflected real money, and that they would receive this money immediately after the experiment. In the fourth phase, the results from the quiz were made public. They were also told whether or not they belonged to the two winners. In the fifth phase, only the two winners had to indicate (for the second time) how they wanted to distribute 20 credits. They were allowed to choose the same distribution as in phase 3, but they were also allowed to make different choices. The two losers did not have to do anything during this phase. In the sixth phase, it was randomly decided by the computer what distributions (those of phase 3 or those of phase 5) would be used. A total distribution was calculated, adding up the relevant distributions of the two winners. Each player was informed about her/his earnings and about the players responsible for these earnings.

In some conditions, there were four shots rather than one shot. In the case of four rounds, the exact same six phases were repeated four times, although instructions were only given in the first round. The two winners might be different for every round, but could also be the same. Each player could win zero, one, two, three or four rounds.

After the experiment itself, subjects were required to fill out some exit-questions about their political preference (“What party did you vote for during the last election?”), their attitudes (favourable or unfavourable) to the welfare state and some questions about their use (frequent or infrequent) of several newspapers, internet-sites and television programmes.

2.3. Design and independent variables

Based on the various conditions, the study uses a 2*2 factorial design (Figure 1). The participants were quasi-randomly assigned to one of the four experimental conditions. As in many earlier game theoretical experiments, the subjects of our solidarity game played for real money, giving them a strong incentive to take the experiment seriously. When real money is at stake, sharing behaviour will in general be more informative and less gratuitous, than when subjects are asked about their willingness to act solidary in survey research.

Figure 1: The four conditions of the solidarity game

	One shot	Four shots
Performance based	Condition 1	Condition 3
Random based	Condition 2	Condition 4

In the field study it was difficult to assign the subjects completely randomly to the various conditions of the game. The subjects who were recruited from the market were told in advance about the time investment in the experiment. As the ‘four shots conditions’ took a time investment of about 45 minutes, compared to 25 minutes in the ‘one shot conditions’, and only a minority of all visitors of the Dapper market agreed to participate, it is theoretically possible that the ‘four-shots conditions’ attracted a different pool of subjects than the ‘one shot conditions’.

In the ‘one shot conditions’ an experimental credit had a 1:1 exchange rate with a euro, whereas a credit was worth 25 eurocent in the ‘four shots conditions’. So in all conditions the average earnings per player (excluding the show-up fee of 7 or 10 euros) were 10 euros.

2.4. Dependent variable and method of analysis

The dependent variable is the degree of voluntary sharing, as operationalized by the number of credits that players (are willing to) give to other players. In our regression analyses, each actual or intended gift to another player is taken as a separate observation. Thus, a gift is a dyadic relation between a donor and a (potential) beneficiary. Accordingly, the number of observations for each player varies between three (a loser in a one-shot-game who can only once declare his or her intention to donate money to the other three players) and 24 (a person who is a winner in each round of a four-shot-game and, hence, can declare eight consecutive times what s/he intends to give to the other three players). The total number of observations is 1,890 (divided by 180 persons).

3. Results

3.1. Basic analysis

Table 2 displays the average (intended) gift for each combination of conditions, rounds and distribution of the game. An average gift amounts to 2.81 credits, which means that the players (are willing to) donate on average an amount of 8.44 credits from their 20 credits to the other players. The differences between the various conditions of the game are rather small and statistically not significant. Thus, the players are almost insensitive to the kind of game and display a general solidary attitude that is not dependent on the specific conditions. We do not find that players give more in the random based game than in the performance based game, neither do they give more in the first round of the four shot game than in the one shot game. We do, however, find that the average gift declines as the four shot game progresses, though this effect is rather small (and not significant). In general, the winners give less in the second distribution after they have been announced than before they knew they were winners, but again, this effect is small and statistically not significant.

Table 2. (Intended) gift by conditions of the game

	Distri- bution	Total			Performance based			Random based		
		Mean	N	Std. Deviation	Mean	N	Std. Deviation	Mean	N	Std. Devia- tion
Total	Total	2.81	1890	2.36	2.87	990	2.34	2.75	900	2.38
	1	2.87	1260	2.34	2.95	660	2.32	2.79	600	2.36
	2	2.70	630	2.39	2.71	330	2.35	2.68	300	2.43
1 shot game	Total	3.24	450	2.19	3.12	270	2.23	3.43	180	2.11
	1	3.39	300	2.15	3.41	180	2.23	3.38	120	2.03
	2	2.95	150	2.24	2.56	90	2.14	3.53	60	2.27
4 shots game round 1	Total	2.99	360	2.35	3.13	180	2.42	2.85	180	2.28
	1	2.98	240	2.34	3.04	120	2.38	2.91	120	2.31
	2	3.03	120	2.38	3.32	60	2.50	2.73	60	2.24
round 2	Total	2.83	360	2.28	2.97	180	2.35	2.69	180	2.21
	1	2.93	240	2.29	3.10	120	2.30	2.76	120	2.27
	2	2.64	120	2.27	2.72	60	2.45	2.57	60	2.10
round 3	Total	2.45	360	2.34	2.56	180	2.35	2.34	180	2.34
	1	2.51	240	2.34	2.53	120	2.31	2.49	120	2.38
	2	2.32	120	2.35	2.60	60	2.44	2.03	60	2.25
round 4	Total	2.44	360	2.55	2.44	180	2.30	2.44	180	2.78
	1	2.42	240	2.50	2.44	120	2.31	2.39	120	2.68
	2	2.49	120	2.67	2.45	60	2.30	2.53	60	3.01

Since the various gifts of one particular player are likely to be correlated, we use a multilevel approach to analyse the determinants of an (intended) gift. The separate gifts are nested within an individual player. Moreover, the gifts of the players of a particular game may also be correlated, for example because the composition of the group affects the giving behaviour of all participants in a particular way. Consequently, the four players of a game are nested within a group. In addition, the gifts within a particular round of the four-shots game may be correlated as well as the gifts within the same distribution (first or second) of a particular round. Consequently, in the multilevel analysis we take account of possible correlations within distributions, within rounds, within individuals and within groups.

Our main interest in this section is whether the differences in characteristics between the players (or, alternatively, their social distance) and the heterogeneity or diversity of the group affect the gifts of the players. The results of our basic analyses are shown in Table 3.

We start with an empty model (A), which includes only a fixed intercept and random intercepts for groups, individuals, rounds and distributions. This model shows that gifts differ significantly between individuals, but not between groups, rounds and distributions. This indicates that group characteristics (such as group heterogeneity) as such do not matter much for individual giving behaviour and that the gifts within one distribution in a particular round of the game are not significantly correlated with each other. Therefore, we exclude these latter levels (group, distribution and round) in the following analyses.

Next, in model B, we retain the individual level in the multilevel analysis and include some characteristics and outcomes of the game as explanatory variables. These characteristics include whether the assignment of the winners of the game is performance based or random based, the round of the game (including a distinction between a one shot game and the first round of a four shots game) and whether the gift is part of the first or the second distribution of each round. The first and last of these characteristics do not significantly affect the average gift. Thus, a winner who is randomly selected does not give more to other players than a winner who has actually performed better than others. It also does not matter whether the player knows if s/he is the winner or not. However, in the four shots game there is a significant effect of the round of the game: the average gift declines as the game progresses. In the first round of the four shots game, players donate each other .9 credits more than in the fourth round. Remarkably, opposed to what we would expect, the players give more to each other in the one shot game than in the first round of the four shots game, although the difference is not significant.⁴

We also include some outcomes of the game as explanatory variables. The (expected) score on the quiz does significantly reduce the gift of a player. A player who expects (at the first distribution) or knows (at the second distribution) that s/he has a maximum score of ten points donates on average .8 credits less to the other players than if s/he expects or has a score of zero. This suggests that players are less willing to share their profit with others if they really deserve it by having performed well.⁵ This result is somewhat unexpected, since we found that players are not more generous in the random based games than in the performance based games.

To test whether the players reciprocate gifts that they have received in previous rounds of the game we include the total amount of gifts received by a player in the previous round (of course, this is only relevant in the four shots game). This variable turns out to be highly significant. For each credit received from other players in the previous round, players tend to give .07 credits extra to each of the other players (so, .22 credits in total) in the current round. Thus, there is indeed clear evidence for reciprocity as a motive for gift-giving.

4 These results differ from the results of the first phase of the experiment that was conducted with students of the University of Amsterdam (see De Beer and Berg, 2012). These differences need further examination.

5 This effect does not differ between the first and second distribution.

Table 3. Multilevel analyses of (intended) gifts in the Dapper area

Fixed effects	A			B			C			D			E		
	B	SE	sign.	B	SE	sign.	B	SE	sign.	B	SE	sign.	B	SE	sign.
intercept	2,873	,236	,000	2,537	,338	,000	-,164	1,173	,889	,484	1,206	,689	-,1303	1,767	,462
condition (random = ref.)															
performance				,030	,285	,915	,099	,286	,730	,124	,288	,668	-,174	,326	,593
round															
round 1 of 1				1,240	,300	,000	1,396	,305	,000	1,377	,306	,000	1,348	,358	,000
round 1 of 4				,902	,129	,000	,903	,129	,000	,902	,128	,000	,893	,128	,000
round 2 of 4				,375	,112	,001	,376	,112	,001	,376	,111	,001	,378	,111	,001
round 3 of 4				,080	,112	,474	,080	,112	,474	,081	,111	,467	,083	,111	,456
round 4 of 4 (ref.)				,000			,000			,000					
distribution (2 = ref.)															
1				,104	,079	,189	,099	,079	,211	,099	,079	,205	,096	,079	,220
(expected) quiz score				-,078	,027	,004	-,081	,027	,003	-,080	,027	,003	-,083	,027	,002
gifts received				,073	,020	,000	,073	,020	,000	,073	,020	,000	,070	,020	,000
sex (female = ref.cat.)															
male							,125	,317	,694	,158	,337	,639	,096	,404	,812
age							,128	,050	,012	,117	,051	,024	,121	,057	,035
age squared / 100				-,128	,057	,027	-,128	,057	,027	-,116	,058	,047	-,116	,064	,075
cultural background															
native							-,246	,537	,689	-,235	,545	,654	-,200	,646	,684
Surinamese							,075	,625	,905	,092	,629	,884	,371	,677	,584
Turkish/Maroccan				-,246	,827	,767	-,246	,827	,767	-,269	,832	,747	-,168	,848	,844
European				-,960	,780	,220	-,960	,780	,220	-,1,001	,786	,205	-,671	,850	,432
other				,000			,000			,000					
Dapper area residence															
less than 1 year							,649	,697	,140	,298	,713	,103	,181	,729	,097
from 1 to 5 years							,228	,492	,643	-,068	,502	,893	-,179	,564	,804
from 6 to 10 years							,612	,569	,283	,379	,576	,512	,380	,687	,751
from 11 to 20 years							-,1,269	,564	,026	-,1,526	,574	,009	-,1,671	,630	,581
more than 20 years							-,225	,459	,625	-,483	,468	,304	-,570	,552	,009
no resident (ref. cat.)							,000			,000					,303
sex difference															
male giving to female							-,247	,200	,129	-,247	,200	,129	-,229	,203	,176
same							-,242	,120	,043	-,242	,120	,043	-,228	,122	,062
female giving to male (ref.cat.)							,000			,000					
difference of cultural background															
native giving to non-native							-,232	,186	,214	-,232	,186	,214	-,259	,189	,000
															,171

same non-native giving to native (ref. cat.)	,244	,148	,100	,253	,149	,090
difference of Dapper area residence						
non resident giving to resident same	-,545	,197	,021	-,558	,202	,020
resident giving to non resident (ref.cat.)	-,343	,161	,033	-,341	,165	,039
age difference (absolute)						
age difference squared / 100	,020	,010	,035	,020	,010	,039
sex diversity	-,055	,021	,007	-,056	,021	,007
0 males				-,158	,603	,965
1 male				-,191	,561	,794
2 males				,007	,569	,734
3 males (ref.cat.)				,000	,000	,990
4 males				-	-	-
cultural diversity						
0 natives				-	,960	,120
1 native				,960	,593	,108
2 natives				,562	,482	,245
3 natives				,974	,416	,020
4 natives (ref. cat.)						
residency diversity						
0 Dapper area residents				-,065	,789	,452
1 Dapper area resident				,246	,716	,934
2 Dapper area residents				,076	,687	,732
3 Dapper area residents				,858	,722	,912
4 Dapper area residents (ref. cat.)						,237
age diversity: Gini index				3,422	2,191	,120
Random effects (Covariance variables)						
group	,276	,262	,293			
person	3,056	,415	,000			
round	,100	,088	,254			
distribution	,009	,017	,594			
n (gifts)	1890			1890		1890
n (persons)	180			180		180
n (groups)	45			45		45
-2 Restricted Log Likelihood	7299,6			7275,3		7242,2

In the third model (C), we add some characteristics of the player, viz. sex, age (and age square to allow for the possibility of a curvilinear relationship), cultural background⁶ and whether and how long the person has been living in the Dapper area. Of these individual characteristics, age is the only one that matters. Older people tend to give more than younger people, but since age square has a negative sign, this relationship is curvilinear. Up till the age of 50 players give more, but beyond that age their gift declines again. To illustrate the size of the age effect: a person aged 50 will on average give one credit more than a person aged 22. Sex, cultural background and whether the player is a resident of the Dapper area or not do not significantly affect the gift of a player.

3.2. The impact of differences in characteristics between players

Our first hypothesis states that a player shares less with a co-player who differs from her/him in various characteristics than with a co-player who has similar characteristics. To test this hypothesis, we introduce a number of variables that measure the difference in characteristics between the player and the potential beneficiary (model D). We include three variables that indicate whether the player and the potential beneficiary have the same sex, have the same cultural background and are residents of the same neighbourhood, respectively. These variables take the value 0 if the two persons are identical with respect to the particular characteristic, the value -1 if they differ and the donor is either male, native or no resident of the Dapper area, and the value 1 if they differ and the donor is either female, non-native or a resident of the Dapper area. By using these variables we take account of the possibility that the giving relationship between two persons is asymmetric. For example, we allow for the possibility that females tend to give more to males than males tend to give to females. With respect to age, we include both the age difference and the absolute value of the age difference between the donor and the potential beneficiary. By including the age difference we allow for the possibility that older people give more to younger people than younger people give to older people, and vice versa, while the absolute value of the age difference takes account of the possibility that it is not relevant whether the donor is older or younger than the potential beneficiary. Since the age difference turned out to be insignificant (not shown in the table), while the absolute value is significant, we only include the absolute value in the final model. We also add the square of the age difference in order to allow for a non-linear relationship.

6 The players were asked what their cultural background was, although the answering options actually referred to their ethnic origin, viz. Dutch, Surinamese, Antillean, Indonesian, Turkish, Moroccan, Eastern European, other European, African, Asian, Latin American, North American and Australian, respectively.

In Table 3 the results are shown under model D.

A difference in cultural background between the donor and the potential beneficiary has a highly significant negative impact on solidarity. Natives tend to give almost half a credit (.47) less to non-natives than to natives, while non-natives give .24 credits less to natives than to non-natives. This confirms our first hypothesis as far as a difference in cultural background is concerned: natives and non-natives tend to discriminate each other. This result provides support for the conflict theory, but, as noted above, it is not necessarily in conflict with the constrict theory.

There is also a significant effect of a difference in residency. However, Dapper area residents give on average .34 credits more to non-residents than to their fellow residents, while non-residents give .20 credits less to Dapper area residents than to other non-residents. Put differently, non-residents receive larger gifts than residents. This result is not easily explained. Perhaps, Dapper area residents want to welcome visitors, while visitors feel a social distance to Dapper area residents.

Sex difference between donor and potential beneficiary has no effect on the average gift. There is no evidence that men or women give more (or less) to players of their own sex than to players of the opposite sex.

With respect to age, both the absolute value of age difference and the squared age difference have a significant effect on gift-giving. Since the first effect is positive and the latter negative, there is a curvilinear relationship. Gifts initially increase with the age difference between the donor and the beneficiary, reaching a maximum at an (absolute) age difference of 18.5 years, and then decline again as the age difference increases further. Thus, solidarity appears to be strongest between persons that differ 18.5 years in age, irrespective of whether the donor is older or younger than the potential beneficiary. By including separate variables for the age difference in case the donor is older and in case the donor is younger than the beneficiary, we tested whether there is an asymmetric pattern of age differences, but this appeared not to be the case.

Taking both the effect of the age of the donor and the effect of the age difference with the potential beneficiary into account, Table 4 displays the estimated gifts by donors to beneficiaries of different ages, compared to a donor and beneficiary who are both 15 years old. This table shows that the ages of the donor and of the beneficiary can explain a variation of gifts with a range of about 2 credits (comparing, for example, the gift of a 15 year old to a 65 year old co-player with the gift of a 45 year old to a 65 year old person).

Consequently, both a very large age difference and a very small age difference are detrimental to solidary behaviour. Put differently, some difference of age enhances solidarity as long as the difference is not too large.

Table 4. *Estimated gift of donor to beneficiary for different ages, compared to 15 year old donor and beneficiary*

Age of donor	Age of beneficiary					
	15	25	35	45	55	65
15	.0 ^a	.1	.2	.1	-.1	-.4
25	.9	.7	.9	.9	.8	.6
35	1.4	1.3	1.2	1.3	1.4	1.3
45	1.5	1.6	1.6	1.4	1.6	1.6
55	1.3	1.5	1.6	1.6	1.4	1.6
65	.8	1.1	1.3	1.4	1.3	1.2

a reference category

3.3. The impact of group diversity

The second hypothesis states that group diversity or heterogeneity exerts a separate negative effect on solidarity, in addition to the aggregate effect of dyadic differences between the players in the group, which has been tested in the preceding section. Thus, we test whether players in a heterogeneous group are less willing to share money with their co-players than players in a homogeneous group. The results are shown in Table 3 under model E. We construct four variables that measure group diversity with respect to sex, cultural background, residency and age, respectively. Sex diversity is simply measured as the number of males in the group (ranging from 0 to 4), cultural diversity is measured as the number of natives in the group (ranging from 0 to 4, too) and residence diversity is measured as the number of Dapper area residents in the group (also ranging from 0 to 4). By using these simple measures and treating them as categorical variables, we allow for a possible non-linear relationship between group diversity and solidarity. For example, it is conceivable that a homogeneous native group has a different effect on giving behaviour than a homogeneous non-native group (which, actually, need not be ethnically homogeneous, since the non-natives can belong to different ethnic groups; we come back to this point later). Table 5 shows the frequencies of the group composition with respect to sex, cultural background and residency. From this table one can read that there are 35 groups with no male, 36 groups with one male, et cetera. Likewise, there is no group with only non-natives, 16 groups with one native, et cetera.

Table 5. Composition of the groups by sex, cultural background and residency

Number of males / natives / Dapper area residents per group	Number of groups by		
	sex	cultural background	Dapper area residency
0 persons	35	0	15
1 person	36	16	45
2 persons	20	23	18
3 persons	14	39	14
4 persons	0	27	13
Total	105	105	105

Age diversity is measured by the Gini index of the ages of the four group members (which theoretically ranges from 0, if all have the same age, to 1 if three persons have a zero age and the other a positive age). The Gini index measures the average absolute age difference between all possible pairs of players within a group, divided by the average age of the players in the group.

None of these four measures of group diversity turns out to have a significant effect on the average gift within the group.

Consequently, the experiment does not lend support to the hypothesis that ethnic heterogeneity hurts solidarity. To the contrary, mixed ethnic groups tend to be more generous towards each other than purely native groups, although the differences are not significant. This result contradicts the constrict theory, which assumes an independent effect of group diversity on solidarity, but it is not necessarily inconsistent with the conflict theory.

We also do not find any support for a (negative or positive) influence of age diversity, sex diversity or residence diversity. Group composition does not seem to matter for solidary behaviour. This confirms our initial finding (model A) that the gifts within a group are not significantly correlated.

Since the Gini index may not be the best way to measure age diversity, we also included two other variables which simply measure the number of young people in a group (defined by an age up till 35 years) and the number of old people in a group (defined by an age of 55 years and over). These two variables do not have a significant effect, either, nor does the interaction term between the two variables. We therefore conclude that, although the age of the individual players matters, the age composition of the group has no impact on giving behaviour within the group.

It should be noted, that the estimated coefficients of the indicators for group composition measure the pure group diversity effect, since we also include the variables measuring the differences between two subjects. So, average solidarity in heterogeneous groups may be smaller than in homogeneous groups, but this

is due to the aggregate effect of the dyadic relations between the individual players and not to the diversity of the group as such. To illustrate, since both natives and non-natives give more to co-players from their 'own' ethnic group than to players from the other group, the average gift in ethnically homogeneous groups is larger than in mixed groups. Based on the estimates of these effects in model E, we can calculate that gifts in ethnically homogeneous groups are on average .25 credits larger than in mixed groups. However, this difference is not caused by the diversity of the group itself and, consequently, does not lend support to our second hypothesis, which relates solidarity to the group composition.

3.4. Interaction between group diversity and dyadic differences

Hypothesis 3 states that group diversity has a stronger negative effect on the gift of a donor to a player who differs from her/him in some characteristics than to a similar player. To test this hypothesis, we include interaction terms between the dyadic differences and the corresponding indicators for group diversity (model F). For example, we include the interaction term between the sex diversity of the group (i.e. the number of males in the group) and the sex difference between two players. With this interaction term, we test whether gifts between men and women in primarily male groups (i.e. a group with three males) differ from these gifts in primarily female groups (i.e. a group with three females) and in balanced groups (two males and two females).

These interaction terms are not significant for sex differences and age differences, but they are strongly significant for cultural background and residence. Table 6 shows the results for cultural background.

The results are rather puzzling. Since each group counts four players, the cultural diversity is largest if a group consists of two natives and two non-natives and groups are homogenous if they are made up of four natives or of no natives (the latter composition was absent in our experiment). If we compare heterogeneous groups with two natives with fully native groups, average gifts turn out to be larger in the heterogeneous group than in the homogenous group. Moreover, in the heterogeneous groups, the size of the gift is not affected by a difference in cultural background between the players. Players from the same ethnic group give each other just as much as players from different ethnic groups. These results contradict both the conflict and the constrict theory.

Table 6. Estimated effect of cultural diversity and difference in cultural background on giving

Cultural diversity	Cultural difference: donor → beneficiary				Average gift
	native → native	non-native → non-native	native → non-native	non-native → native	
1 native		.052	-.107	-.398	-.100
2 natives	-.489	-.420	-.485	-.402	-.447
3 natives	.432		-.213	0 ^a	.163
4 natives	-.611				-.611

a reference category

However, the picture becomes more complex if we look at the groups with one native or three natives (i.e., one non-native). The average gift in these groups is considerably larger than in the groups with maximum heterogeneity (two natives) or maximum homogeneity (four natives). In groups with three natives and one non-native, the natives give each other on average .65 credits more than they give to the non-native, while the non-native gives the natives also considerably less. In groups with three non-natives (and, thus, one native), the non-natives give each other .45 credits more than the native, although the single native gives the non-natives only slightly less than the non-natives give to each other.

Apparently, the (ethnic) majority of a group discriminates against a single co-player with another ethnic background, but if the ethnic groups balance each other, the players do not discriminate the members of the other group. However, the average size of the gifts is larger in the groups with either one or three natives than in the homogeneous groups or the groups in which the numbers of natives and non-natives are equal. Consequently, it is not so much that a majority of natives penalizes the single minority player (negative discrimination), but rather that the majority players favour each other (positive discrimination). This would mean that ethnic diversity does not harm solidarity, but actually boosts solidarity within ethnic groups, without hurting solidarity with members of other ethnic groups. However, this in-group favouritism disappears if the different ethnic groups are equal in size.

Although we are not particularly interested in the effect of diversity of residence of a group, it is nevertheless interesting to see whether we find similar effects as with respect to cultural background. Table 7 shows the effect of residence diversity on the gifts between residents and non-residents of the Dapper neighbourhood.

Table 7. Estimated effect of diversity of residency and difference in residency on giving

Diversity of residency	Residence difference: donor → beneficiary				Average gift
	resident → resident	non-resident → non-resident	resident → non-resident	non-resident → resident	
0 residents		-.713			-.713
1 resident		-.264	.056	-.356	-.207
2 residents	-1.723	-.056	-.794	-.651	-.778
3 residents	-.236		-.270	0 ^a	-.185
4 residents	-.697				-.697

a reference category

Remarkably, the results are similar to the results of cultural diversity. The average gift is the biggest if one of the four players in a group is a ‘minority’, while it is smaller in the fully homogenous groups as well as in the most heterogeneous group (two residents and two non-residents). However, the pattern of discrimination differs. In the groups with one and three residents, there is hardly any discrimination at all, contrary to the results with respect to cultural diversity. In the groups in which residents and non-residents balance, both the residents and the non-residents discriminate against residents.

Combining the results of Tables 6 and 7, we can depict the patterns of solidarity that emerge from the experiment with respect to group diversity. In Table 8 we show for each of the four possible characteristics of the players with respect to cultural background and residency (viz. natives, non-natives, residents and non-residents), the amount of in-group solidarity, out-group solidarity, discrimination and the average gift. In-group solidarity is interpreted as the average gift to a person from the same category (e.g., a gift by a non-native to another non-native), out-group solidarity is the average gift to a person from the other category (e.g., a gift by a non-native to a native) and discrimination is interpreted as the difference between in-group and out-group solidarity. These gifts are related to the total number of members of the player’s category (in-group) in the group. Thus, ‘3 in-group members’ means for a native that the group includes 3 natives, while it means for a non-native that the group includes 3 non-natives.

Table 8 Patterns of giving related to diversity

	number of in-group members	natives	non-natives	residents	non-residents
In-group solidarity	4	-.61		-.70	-.71
	3	.43	.05	-.24	-.26
	2	-.49	-.42	-1.72	-.06
Out-group solidarity	3	-.21	-.40	-.27	-.36
	2	-.40	-.40	-.79	-.65
	1	-.11	.00 ^a	.06	.00 ^a
Discrimination	3	.64	.45	.03	.09
	2	-.09	-.02	-.93	.59
Average gift	4	-.61		-.70	-.71
	3	.15	-.10	-.42	-.39
	2	-.43	-.41	-1.10	-.45
	1	-.11	.00 ^b	.06	.00 ^b

a reference category for in-group and out-group solidarity.

b reference category for average gift.

Source: calculated from Tables 6 and 7

The patterns are remarkably similar for the different characteristics. In-group solidarity is the largest in case of three in-group members. Out-group solidarity is the largest in case a player is the only member of her/his in-group, followed by three in-group members. Discrimination against out-group members is larger in case of three in-group members than in case of two in-group members (here, the non-residents are an exception). Average gifts are the biggest in case of one or three in-group members and the smallest in case of two or four in-group members.

These results contradict both the conflict and the constrict theory. According to the constrict theory, in-group solidarity should decline with increasing group diversity, but Table 8 shows that in-group solidarity is larger in a group with one out-group member than in a completely homogeneous group. According to the conflict theory one would expect more out-group discrimination in a group with two in-group and two out-group members than in a group with only one out-group member, while the opposite is the case. And both theories predict that average gifts decline with increasing heterogeneity of the group, which is contrary to the results shown in Table 8.

It is not clear how these patterns should be interpreted. The phenomenon of out-group favouritism by a member of a minority group is not unfamiliar in the social psychological literature, but it is usually related to the low status of (ethnic) minority groups (cf. Tajfel 1982: 9-12). Since we also found out-group solidarity for natives who are a minority within their group, this suggests that it is the size of the in-group and not its status that matters here. Social psychological experiments about the effect of the relative size of

the in-group have yielded contradictory results (Sachdev and Bourhis 1991). Leonardelli and Brewer (2001) did not find a significant difference of out-group discrimination between members of minority groups and members of majority groups in case they identify equally strongly with their in-group.

A possible explanation for our results would be that players wish to avoid belonging to the minority within their group. A priori, they belong to their in-group, but in case they show solidarity to out-group members, they may hope or expect to be accepted by the out-group. In case the other three players belong to their in-group, they do not need to do anything to be accepted as a member of the majority group, and consequently, they give very little to their co-players. In case there are no other in-group members, a player tries to be accepted by the three out-group members by sharing much with them. In case of two in-group members and two out-group members, there is no minority and, consequently, it does not matter which group one belongs to. Therefore, players do not give much to other players and do not have a reason to discriminate. Finally, if there are two other in-group members and one out-group member, it is important to show that one belongs to the majority of in-group members by giving more to them than to the one out-group member.⁷

The reason that the results for non-residents depart somewhat from this general pattern, is probably that non-residents do not consider themselves to be members of a separate group, since the only thing they have in common is that they do not live in the Dapper neighbourhood. Since living outside the Dapper neighbourhood is not a salient aspect of their identity, they do not have a reason to distinguish between co-players from their in-group and from the out-group, i.e., residents of the Dapper neighbourhood.

3.5. Cultural diversity more closely examined

The most salient outcomes of our analyses are the significant negative effect of a difference in cultural background on the size of a gift (confirming hypothesis 1), the absence of an independent effect of group diversity (refuting hypothesis 2) and the non-linear interaction effect between group diversity and the cultural difference between donor and beneficiary (refuting hypothesis 3). However, since we only distinguished between natives and non-natives, it is worthwhile to explore this interaction effect of cultural difference and diversity in more detail.

⁷ The alleged wish to belong to the majority group is probably not based on forward looking reciprocity, i.e. that players hope to be rewarded for their generosity in the next round. If that would be the case, we would expect this effect to be absent in the one shot game and in the final round of the four shots game. However, the pattern is more or less similar in the one shot game and in all rounds of the four shots game.

An interesting question is whether this interaction effect is the same for all ethnic groups. Thus, instead of taking the difference between natives and non-natives as the explanatory variable, we include an interaction term between the cultural background of the donor and the cultural background of the potential beneficiary. This variable distinguishes five ethnic groups, viz. natives, Surinamese, Turks/Moroccans, European immigrants and other non-natives⁸. If we add the interaction term between the cultural background of the donor and of the beneficiary in the multilevel regression model, it has a significant effect. Table 9 shows the estimated effects for the various combinations.

Two effects stand out, viz. the significantly smaller gift of natives to Turkish or Moroccan co-players and to other European co-players. However, natives do not discriminate against Surinamese or players with an ‘other’ cultural background, such as Asian or African. Another notable effect is that Surinamese players and players with an ‘other’ cultural background tend to favour themselves and each other.⁹ Turkish and Moroccan players and non-Dutch European players give less than the other players, but since they never encountered a player with a similar background in the same group, we do not know whether they would have been more generous to a person from their own group.

Table 9. Estimated effect of difference in cultural background on giving

beneficiary	donor				
	native	Surinamese	Turkish/Moroccan	European	other
native	.093	.063	-.454	-.893	-.177
Surinamese	.023	.556	-.363	-.734	.456
Turkish/Moroccan	-.996	.243			-.266
European	-.785	.135			-.448
other	.116	.804	-.035	-1.292	0 ^a

a reference category

Since a content analysis of mass media (Lepianka 2012) shows that the media display a considerably more negative image of people with a Moroccan background than people with a Turkish background, it would be interesting to test whether natives give even less to Moroccans than they do to Turks. However, since only 4 Turks and 4 Moroccans participated in the experiment, their numbers are too small to draw any statistically reliable inferences on solidarity of natives towards Turks vis-à-vis Moroccans.

⁸ The latter category includes six players with an Asian background, six with an African background, two with a Latin American background and one with an Indonesian background.

⁹ Since the category ‘other’ includes only two persons with a Latin American background, the solidarity between Surinamese and these ‘others’ is apparently not related to a similar geographical region of origin.

Since the non-natives in our sample include many different cultural backgrounds, a gift from a non-native to another non-native should not be considered as an intra-ethnic gift. To test intra-ethnic favouritism we construct an additional variable that equals 0 if the ethnic background of the donor and of the potential beneficiary are the same and 1 if they are different. If the interaction term between this variable and cultural diversity is included in the analysis, it is highly significant. Table 10 shows the estimated effects.

Table 10. Estimated effect of cultural diversity and equality or difference of cultural background on giving

Cultural diversity	Same cultural background?	
	yes	no
1 native	.169	-.125
2 natives	-.336	-.281
3 natives	.644	0 ^a
4 natives	-.442	

a reference category

This analysis affirms the conclusion from the previous analysis: natives favour each other strongly in the presence of one non-native, and non-natives favour a co-player of their own ethnic group in the presence of one native, but intra-ethnic favouritism is absent if the numbers of natives equals the number of non-natives in a group. Moreover, average gifts are smallest in the fully native groups.

3.6. Effects of media use and political preferences

To further analyse the origin of in-group favouritism, we examine the impact of the media consumption and the political preferences of the players.

Since the mass media are an important source of information for most citizens about other groups within the population (based on sex, age or ethnicity) and since different media may paint a varied picture of different groups (Lepianka 2012), it is conceivable that the kind of media that the players use affects their picture of their co-players and, consequently, their willingness to share money with them. Therefore, the players were asked which of the following news media they followed regularly: the daily newspapers *De Telegraaf* and *de Volkskrant*, the TV news items *NOS Journaal* and *Hart van Nederland*, the news website *nu.nl* and other media.

A factor analysis shows that the variance of media consumption can be reduced to two dimensions, one referring to the frequency of watching *Hart van Nederland* and reading *De Telegraaf*, the other to the frequency of reading *de Volkskrant* and *Nu.nl* and using other media.¹⁰ For these dimensions two new variables are

¹⁰ Unfortunately, the reliability of the two scales (as measured by Cronbach's alpha) is rather low, viz. .55 and .39, respectively.

constructed, both ranging from 0 to 1. If these two variables are included in the regression model, both are significant. Frequent *Hart van Nederland* and *De Telegraaf* consumers give less than those who do not use these media, while frequent *Volkscrant*, *Nu.nl* and other media consumers are more generous.

Next, we examine whether the kind of media a player uses affects her/his gifts to players with another ethnic background in particular. Thus, we include an interaction term between both variables for media usage and whether the (potential) gift goes from a native or non-native to a native or non-native. This interaction term is highly significant. Table 11 shows the results. People who frequently watch *Hart van Nederland* or frequently read *De Telegraaf* give .4 credits less to players from another ethnic group than to players from their in-group compared to those who never use these media. Native frequent readers of *de Volkscrant*, *Nu.nl* and other media, however, give 1.8 credits more to non-native players than to native players compared to those who never use these media. But non-native users of these media do discriminate against natives. Thus, *Hart van Nederland* and *Telegraaf* users give relatively little and tend to discriminate against players from another ethnic group, while frequent users of *de Volkscrant*, *Nu.nl* and other media are more generous and favour non-native co-players.

Table 11. Estimated interaction effect of media consumption and difference in cultural background on giving

Media consumption	Cultural difference: donor → beneficiary			
	native → native	native → non-native	non-native → non-native	non-native → native
Hart van Nederland/De Telegraaf^a	-1.761	-2.195	-.549	-.942
de Volkscrant/Nu.nl/other media^b	.911	2.579	2.299	1.424

a Ranges from 0 for those who never watch *Hart van Nederland* and never read *De Telegraaf* to 1 for those who use these media at least once a week.

b Ranges from 0 for those who never read *de Volkscrant*, *Nu.nl* and other media to 1 for those who use these media at least once a week.

Next, we examine whether the political preferences of the players affect their giving behaviour. The players were asked which party they voted for at the last general elections for parliament. This variable has a significant impact ($p < .05$) on the average gift. Table 12 shows the results. In this table, political parties are ordered more or less from right wing to left wing.

Table 12. Effect of political party voted for at last elections on (intended) gifts

	B	SE	Sign. ^b
PVV	-.531	.692	.445
VVD	.008	.620	.990
CDA	1.656	1.165	.158
CU	.624	1.141	.585
D66	1.349	.634	.035
PvdA	.355	.450	.432
GL	.719	.539	.185
PvdD	2.216	.990	.027
SP	1.827	.536	.001
Did not vote/other	0 ^a		

a reference category

b significance of difference with the reference category

Players who voted for the right-wing parties PVV and VVD donate the least, players who voted for the left-wing PvdD and SP, but also those who voted for the Christian-democratic CDA give the most to other players. However, we are primarily interested in how party preferences are related to ethnic discrimination. Since the numbers of voters for most parties are rather small, we rearrange voting behaviour into six categories, taking together the parties with a similar impact on gift-giving. The interaction term between this condensed voting variable and the cultural difference between the donor and the recipient is highly significant ($p < .01$). The results are shown in Table 13.

Table 13. Effect of political party voted for at last elections and difference of cultural background of donor and beneficiary on gifts

Political party	Cultural difference: donor → beneficiary			
	native → native	native → non-native	non-native → non-native	non-native → native
PVV/VVD	-.038	-.200	-1.307	-.720
CDA/CU	1.233	.890		
D66/GL	1.200	.656	.707	-.300
PvdA	-.539	.583	1.083	.561
SP/PvdD	1.884	1.899	1.151	1.584
did not vote/other	0 ^a	0 ^a	0 ^a	0 ^a

a reference category

Comparing the natives who voted for various political parties, the voters for the right-wing PVV and VVD give the least to non-native players, but they also give relatively little to other natives. Consequently, they do not discriminate much against non-natives. Native voters for the CDA, ChristenUnie, D66 and GroenLinks, which are situated more or less in the centre of the political spectrum, give considerably more to non-natives, but nevertheless discriminate more against non-natives, since they give even more to fellow natives. Native voters for the left-wing SP and Partij van de Dieren are the most solidary, both with respect

to natives and non-natives and they do not discriminate between these groups. Native voters for the left-wing PvdA are the least solidary towards other natives, but favour non-natives, although they give less to non-natives than the voters for the other parties with the exception of PVV and VVD voters.

With respect to non-native voters the patterns are somewhat different. However, because of the very small numbers of non-natives who vote for various parties¹¹, one should be careful not to draw strong conclusions from these figures.

If we include the interaction between media use and the cultural difference between the donor and the beneficiary as well as the interaction term between party preference and the cultural difference between the donor and the beneficiary, both are still (marginally) significant ($p < .1$). So, apparently, media use and party preference have an independent effect on intra-ethnic favouritism and are not strongly correlated.

3.7. Age difference more closely examined

If using different mass media or voting for different parties affects the gifts of natives vis-à-vis natives and non-natives, it is interesting to test whether these factors also influence the gifts between players of different ages. Therefore, we include the interaction term between the two composite variables for media use and the age difference between two players in our model. Only the interaction term with the use of *de Volkskrant*, *Nu.nl* and other media is (marginally) significant ($p < .1$). Frequent users of these media give more to co-players who have a different age than players who do not use these media. For every 10 years of age difference, the users of these media give .2 credits more than the non-users.

Perhaps more interesting is the impact of voting behaviour on gift-giving between age groups. This effect is highly significant. Players who voted for SP, PvdD, D66 and GroenLinks tend to increase their gift sharply if they differ in age with the beneficiary, while voters for PVV, VVD and PvdA and those who did not vote or refuse to tell, on the contrary, give less to players who have a different age. Figure 2 shows the profiles of gifts for different age differences by party preference.

In view of the quite large effect of party preference on the age difference profile of gifts, it is interesting to test whether party difference also affects the influence of the age of the player on her/his gifts. This is indeed the case. The interaction term between party preference and both age and age square is highly significant ($p < .01$). Figure 3 shows the estimated age profiles. For all party preferences, gifts initially increase with

11 Of the 58 non-native players, only 33 named the party on which they had voted. More than half of them (19 non-native players) voted for the PvdA.

age. But for PvdA, D66 and GroenLinks voters, the maximum gift is reached at the age of 35 to 40, while CDA, CU, SP and PvdD voters increase their gifts up till the age of 50 or 55, and VVD or PVV voters and those who did not vote or refused to tell their vote, increase their gifts indefinitely with age. Put differently, at younger ages PvdA and CDA/CU voters are the most solidary, but at older ages, non-voters, CDA/CU voters and SP/PvdD voters give the highest gifts.

Figure 2. Estimated gifts by age difference and party preference, compared to no age difference

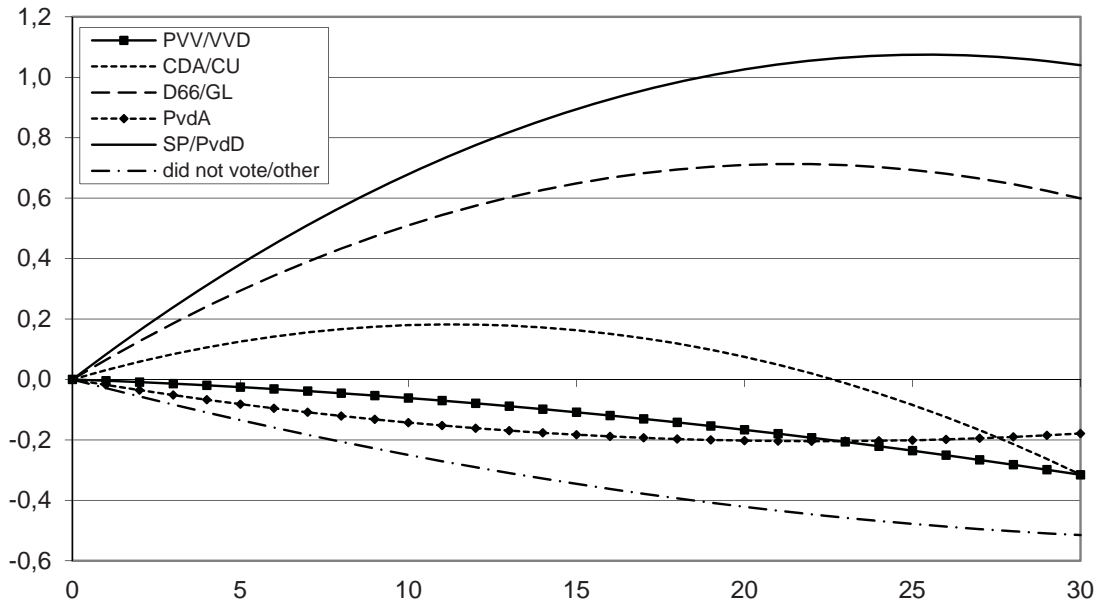
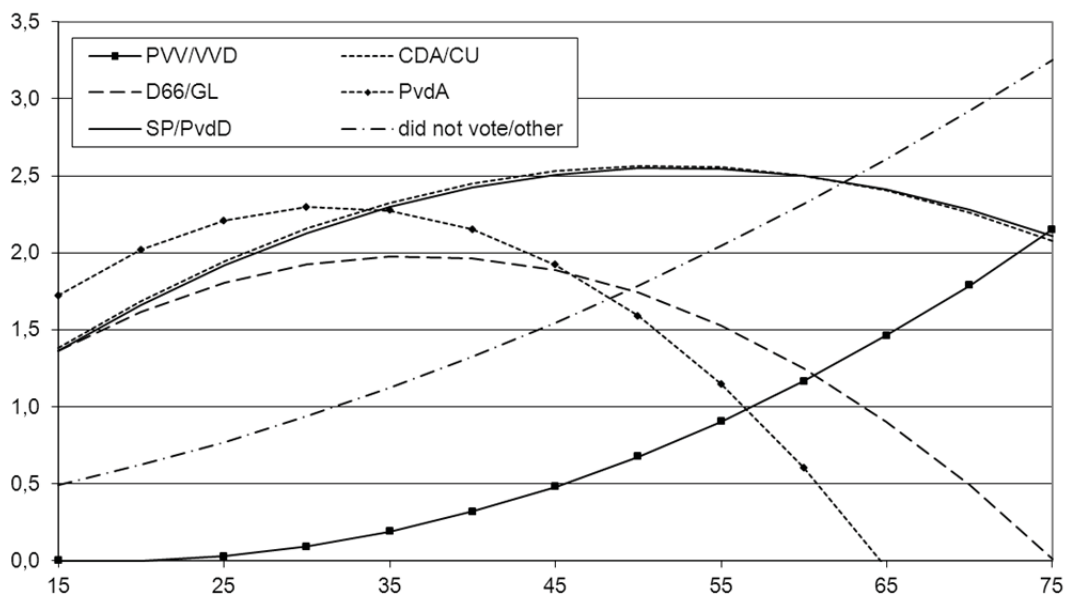


Figure 3. Estimated gifts by age and party preference, compared to a VVD/PVV voter aged 15



4. Conclusion

In this paper we examined the effects of individual characteristics and group diversity on the willingness of individuals to share money they have won in a game with other players. We took the well-known and much debated thesis of Robert Putnam (2007) that ethnic diversity harms both inter-group and intra-group trust and solidarity, as our starting point. Our methodological approach differs from other empirical tests of Putnam's thesis in that we conduct an experiment in which subjects play for real money. Thus, we do not measure attitudes or opinions, but actual behaviour. Moreover, the experimental design allows us to control the conditions under which the subjects act and, thus, makes it possible to draw causal inferences. This experiment also makes it possible to distinguish between the effects of differences between individual players and the effect of the heterogeneity of the group in which they play.

In our experiment, 180 visitors of the Dapper market in Amsterdam participated in a solidarity game, in which they could share an earned sum of money with other players. The players were informed about the sex, the age, the cultural background (ethnicity) and the residency (either in the Dapper neighbourhood or elsewhere) of the other players.

Our main interest is the effect of the characteristics of the players and of the composition of the group in which they play the game on the size of the gift that the subjects are prepared to give to their fellow players. With the exception of age, the personal characteristics per se do not affect giving behaviour, but the differences in characteristics between the players do. In particular, a difference in cultural background between two players has a strong (negative) impact on the gift they bestow each other. Natives discriminate against co-players with a Turkish, Moroccan or European background, but not against Surinamese co-players. Whether the reverse is true is not clear, since there were no groups with more than one Turkish, Moroccan or European player, so we do not know how much they would give to each other. However, Surinamese players and players with an 'other' cultural background also demonstrated a bias in favour of players of their own or each other's group compared to natives, Turks, Moroccan and European players.

This result provides support for the conflict theory, which asserts that members of different (ethnic) groups discriminate against each other.

We also found an effect of the ethnic composition of groups on giving, but there is no straightforward relationship between ethnic diversity and the size of gifts. In general, gifts are largest in groups with either three natives or three non-natives, due to intra-ethnic favouritism within these groups. In case of an equal

number of natives and non-natives within a group, however, there is little evidence for intra-ethnic favouritism or discrimination against players from another ethnic group. Remarkably, we found a similar effect with respect to the diversity of residency within the group, i.e. the number of players who live in the Dapper neighbourhood.

We conclude, that in-group solidarity is the largest in case of three in-group members, while out-group solidarity is the largest if a player is the only member of her/his in-group. Discrimination against out-group members is larger in case of three in-group members than in case of two in-group members (here, the non-residents are an exception) and average gifts are the biggest in case of one or three in-group members and the smallest in case of two or four in-group members.

This is an interesting, but somewhat puzzling result, which deserves further examination. We suggest that an explanation of this result may be that individuals strive to avoid belonging to a minority within their group. If an individual is the only in-group member, s/he wants to be accepted by the majority of out-group members by showing her/his solidarity with them. If there are three in-group members, the individual wants to show her/his adherence with the in-group members by sharing money with them. If all the players belong to the same in-group, however, there is no need to show one's adherence to the group. Finally, if there are two in-group and two out-group members, there is no minority, and, consequently, it does not matter towards which group one shows solidarity.

These results contradict Putnam's constrict theory. We find no evidence that group diversity reduces in-group solidarity. On the contrary, in-group solidarity among natives is the lowest in the fully native groups. Moderate (ethnic) diversity increases in-group solidarity, although maximum diversity reduces it again. We find also very little support for the conflict theory. Although there is a clear tendency to discriminate against players from another ethnic group, this does not decrease total solidarity. Total solidarity is largest in moderately diverse groups, despite discrimination against out-group members.

Regarding age, both the age of the players and the age difference between the players matter. Up till the age of 50, the size of gifts rises with age, and gifts are the largest when the players differ about 18.5 years in age, irrespective of who is older and who is younger. Consequently, solidarity seems to be stimulated by a substantial but not too large age difference. This result, too, needs further study and theoretical explanation. The age composition of the group, as measured by the Gini coefficient or by the share of the old or the share of the young in the group, does not affect (the influence of age differences on) the average size of gifts.

Finally, we examined the relationship between media use and political party preferences on the one hand and gift giving on the other. *Hart van Nederland* watchers, *Telegraaf* readers and VVD and PVV voters are the least generous, while *Volkskrant* and *Nu.nl* readers and SP, Partij voor de Dieren and CDA voters tend to give the most.

There are also some significant interaction effects between media use, party preference and discrimination against players from another ethnic group. Players who frequently read *de Volkskrant* or *Nu.nl* tend to discriminate less against players with another cultural background than players who never use these media. Native voters for CDA, ChristenUnie, D66 and GroenLinks, who are relatively generous, also discriminate the most against non-native co-players. Native PvdA voters are not very generous, but tend to give more to non-native players than to native players.

There is also some effect of media use and party preference on the gifts between players who differ in age. *Volkskrant* readers and *Nu.nl* visitors give more to players who differ in age from them than players who never use these media. Players who voted for SP, PvdD, D66 and GroenLinks tend to increase their gift sharply if they differ in age with the beneficiary, while voters for PVV, VVD and PvdA and those who did not vote or refuse to tell, on the contrary, give less to players who have a different age.

To summarize, both differences in characteristics between players and the composition of the group matter for the willingness of subjects to share money with co-players. However, there is no simple linear relationship between social distance and group diversity on the one hand and the average gift on the other. Both with regard to the age difference between two players and with respect to the ethnic and residence diversity of a group a curvilinear relationship exists. Solidarity is largest if there is a moderate age difference (around 18.5 years) between two players and if group diversity is moderate (i.e. one player differs from the other three players in a group). Complete equality of age and complete ethnic or residence homogeneity of the group result in less solidarity, but so does a very large age difference (say, over 30 or 40 years) and maximum heterogeneity (two natives and two non-natives or two residents and two non-residents).

Moreover, generosity and discrimination against a ‘different’ player are positively related. Put differently, discrimination often does not mean that a player gives less to a co-player who is different, but that s/he gives more to a similar co-player. Thus, discrimination does not lead to less solidarity but may even result in more solidarity. As a consequence, even individuals who are discriminated against may be better off than if there would be less discrimination but also less generosity.

If one looks at these results from a moral perspective, it seems that there is a trade-off between solidarity and equality. Those who are in favour of equal treatment of all individuals, irrespective of the (ethnic) group they belong to, may pay the price of less solidarity. Those who wish to maximize the revenue for the least well-off (cf. Johan Rawls' famous difference principle), may have to accept that some groups are discriminated against.

Testing the effect of group diversity on solidarity by means of a controlled experiment has, of course, a number of limitations. To start, the context of a group of four players is rather artificial. It is not clear whether the effect of the composition of such a small group is similar to the effect of the composition of a larger community, such as a neighbourhood, a city or even a country.

Secondly, we only know a few characteristics of the subjects of the experiment, viz. sex, age, cultural background, residency media use and political preference. It is conceivable that some unobserved characteristics, such as educational level or income, also affect their giving behaviour. If these characteristics are correlated with some of the observed characteristics, some of the relations we found may be spurious. For example, if natives have, on average, a higher education than non-natives, this might explain some of the patterns we have observed.

Thirdly, since most of the passers-by on the Dapper market refused to participate in the experiment, the participants are not a random sample of all the visitors to the market and may therefore not constitute a representative group.

To conclude, the results of this experiment should be interpreted with caution and should preferably be re-examined in a different context and with a different methodological design in future research.

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