Groups and trust: Experimental evidence on the Olson and Putnam hypotheses

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Abstract

Mancur Olson and Robert Putnam provide two conflicting views on the effect of involvement with voluntary associations on their members. Putnam argues that associations instill in their members habits of cooperation, solidarity and public spiritedness. Olson emphasizes the tendency of groups to pursue private interests and lobby for preferential policies. We carry out the first field experiment involving a sample of members of different association types from different age groups and education levels, as well as a demographically comparable sample of non-members. This enables us to examine the differential patterns of behavior followed by members of Putnam-type and Olson-type associations. Coherently with both the Putnam's and Olson's view, we find that members of Putnam-type (Olson-type) associations display more (no more) generalized trust than non-members. However, when we examine trustworthy behavior we find the opposite pattern, with members of Olson-type (Putnam-type) associations more (no more) trustworthy than non-members. No relevant effect for the intensity of participation in associations emerges.

Keywords: Trust; Voluntary associations; Putnam; Olson; Field experiment
JEL classification: A13; D03; C93; Z13.

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1. Introduction

The role of groups in shaping individuals preferences and modes of behavior has attracted the attention of many scholars in the social sciences. Two main theories on the relationship between groups and individuals are contrasted in contemporary investigations. The first is due to Robert Putnam. Drawing on Tocqueville's (1840) seminal analysis, Putnam posits that "associations instill in their members habits of cooperation, solidarity and public-spiritedness." (Putnam et al. 1993: 89–90). The second theory is due to Mancur Olson (1965; 1982). Putnam's optimism on the beneficial role of associations is here replaced by a disenchanted view of the underlying reasons for the existence of associations. Olson emphasizes the tendency of groups to pursue private interests and lobby for preferential policies. Far from instilling public-spiritedness in the society, parochial and partisan interests prevail in the associations' objectives.

These two views are not necessarily irreconcilable. It has been argued that voluntary associations differ in characteristics and purposes. Some types of associations may operate in accordance with Putnam's theory, other with Olson's. In their seminal contribution, Knack and Keefer (1997) classify trade unions, political parties or groups, and professional associations as "Olson-type" associations, as these associations are "most representative of groups with redistributive goals" (Knack and Keefer, 1997; p. 1273). "Redistributive" here is synonym with rent-seeking behavior. The objective of these associations is mainly to redirect society's resources to the benefit of the association members. Education, arts, music or cultural activities; religious or church organizations; and youth work (e.g., scouts, guides, youth clubs, etc.) are defined as "Putnam-type" associations. They are "identified as those groups least likely to act as "distributional coalitions" but which involve social interactions that can build trust and cooperative habits" (Knack and Keefer, 1997; p. 1273).

The previous study, along with other contributions drawing on aggregate country-level data in order to study the effect of associational membership (see section 2 for a review), cannot take into account either the possibility that individuals are members of more than one type of association, or the intensity of their associational activity. Other studies, reviewed in section 2, analyze the effect of associational membership using individual-level surveys (Stolle and Rochon, 1998, Stolle, 1998, Wollebaek and Selle, 2002). Although these contributions are better able to investigate the micro-mechanisms of the relationship between pro-sociality and membership in voluntary associations, the possibility of confounding effects and misreporting that is intrinsic in survey questions hamper their conclusions (e.g. Bertrand and Mullainathan,. 2001; Glaeser et al., 2000; Anderson et al., 2004). Moreover, the use of survey questions on trust has raised much criticism. As Glaeser et al. (2000: 800) put it, "While these survey questions are interesting, they are also vague, abstract, and hard to interpret".

In this paper we revert to an experimental analysis to examine the differential patterns of behavior followed by members of Putnam-type and Olson-type associations. We carry out the first field experiment involving a sample of members of different association types from different age groups and education levels, as well as a demographically comparable sample of non-members. We investigate the level of generalized trust (towards people from the general population) and particularized trust (trust towards fellow members),[1] of members of Putnam-type, Olson-type and other types of association within a Trust Game (Berg et al. 1994).

[1] Generalized trust may be interpreted as a general predisposition toward other people, especially people whom one does not know (Uslaner, 2002) and may be defined as "a trust that goes beyond the boundaries of kinship and friendship and even beyond the boundaries of acquaintance" (Stolle and Rochon, 1998, p.48). It differs from the notion of particularized trust which consists in relying only on people who belong to one's own "moral community" and share the same characteristics (Uslaner, 2002). Berggren and Jordahl (2006, p.143) distinguish between particularized trust and generalized trust where "the former entails trusting people you know or know something about; the latter trusting most (but not all) people you do not know or know anything about.". In this perspective, the notion of knowledge-based trust (Yamigishi and Yamigishi, 1994) clarifies that particularized trust is strictly related to the available information.

First of all, our analysis aims at testing four main hypotheses inspired by the Putnam's and Olson's approaches that we will call *PUTNAM HYPOTHESES* (*A* and *B*) and *OLSON HYPOTESES* (*A* and *B*):

1) *PUTNAM HYPOTHESIS A*: Members of Putnam-type associations display more trust towards the general public (i.e. generalized trust) than non-members;
2) *PUTNAM HYPOTHESIS B*: The level of trust toward their own association members is higher than the level of trust towards the general public for members of Putnam-type associations; that is, particularized trust is higher than generalized trust;
3) *OLSON HYPOTHESIS A*: Members of Olson-type associations do not show higher levels of generalized trust than non-members;
4) *OLSON HYPOTHESIS B*: Members of Olson-type associations display more particularized than generalized trust.

The two "B Hypotheses", i.e. that interaction *within* associations are characterized by higher level of trust than interactions between association members and strangers, are based on the concept of *direct* and *indirect reciprocity* (Fehr and Gächter 2000; Seinen and Schram 2006; Engelmann and Fischbacher 2009). Social networks generated through the association trigger mechanisms based on reciprocity, reputation, monitoring and sanctioning that increase cooperation among members of the same group (Putnam et al. 1993; Putnam 2000; Paxton 2007). Indeed, we should observe members of associations to trust fellow members more than people from the general public regardless of association types.

However, Putnam and other followers of the Tocquevillian tradition argue that participation in associations also fosters pro-social attitudes in interactions with generalised others in the society at large, that is, *outside* the association. This may be in part explained by the very fact that associations increase the density and the overlap of social networks, as this activates the mechanisms based on reciprocity, reputation, monitoring and sanctioning mentioned above. Nevertheless, in large part, this is also based on the conjecture that associational membership will

work towards increasing trust in, and co-operation with, absolute strangers (Putnam et al. 1993, Brehm and Rahn 1997; Stolle and Rochon 1998; Putnam 2000; Wollebaek and Selle 2002). From this approach we derive our *PUTNAM HYPOTHESIS A.*

Conversely, Olson's view (1965; 1982) hinges upon the role of associations in pursuing private interests of members and in relegating the general public interest to a minor role. From this perspective, we expect associations not to affect positively generalized trust (*OLSON HYPOTHESIS A*).

Secondly, not only does the Trust Game allow us to analyze Putnam-type and Olson-type members' patterns of trusting behavior, but also it enables us to study their trustworthiness.[2] Our study is the first to tackle the issue of trustworthiness in relation to different types of association.

Finally, we also examine whether increasing one's involvement with associations affects the behavior of members of different types of associations in our Trust Game. For this purpose we analyze the impact of the number of associations that an individual has joined and the number of hours that individuals report as spending in associational meetings and activities every week.

We investigate the previous issues by randomizing our sample into an in-group and an out-group treatment. In the in-group treatment association members are paired with people from their own association. In the out-group treatment they are paired with people from the general population. Behavior in the in-group and out-group treatments gives us a measure of particularized and generalized trust, respectively. The comparison with the behavior of people from the general population also enables us to contrast generalized trust by members and non-members.

[2] We are aware that different motivational drivers may lead subjects' decisions in Trust Games (e.g. Becchetti and Degli Antoni, 2010). In particular, subjects may be motivated by other regarding preferences (Cox, 2004), altruistic or inequality-averse preferences (Fehr and Schmidt 1999), social-welfare preferences (Charness and Rabin, 2002), warm glow (Andreoni, 1989; 1990) and trust (only on the part of the first mover) or reciprocity (only on the part of the second mover). We are not able, neither is it an aim of our analysis, to disentangle among the different motivations behind subjects' decision in our Trust Game. We simply assume that a higher amount sent by the Sender and a higher share returned by the Receiver are representative of a greater propensity to cooperate. In what follows, we generically refer to trust and trustworthiness when talking about Senders' and Receivers' behavior.

We follow Knack and Keefer's (1997) classification of Olson-type and Putnam-type associations. We involve in our experiment members of trade unions and cultural associations (see section 3). These are representative of the former and latter group, respectively. We also examine the behavior of members of social welfare and health services associations, which we call "Residual" associations, as they are not included in either category in the original Knack and Keefer's (1997) classification.

Both the *PUTNAM HYPOTHESIS A* and the *OLSON HYPOTHESIS A* are confirmed by our experimental evidence. Members of Putnam-type associations trust people from the general population more than non-members (*PUTNAM HYPOTHESIS A*). Members of Olson-type associations treat people from the general population in the same way as non-members (*OLSON HYPOTHESIS A*). With respect to the "B hypotheses", no in-group effect emerges with respect to members of Putnam-type associations, i.e. they trust fellow members as they trust people from the general population. That is, *PUTNAM HYPOTHESIS B* is not supported by our evidence. Conversely, the level of particularized trust of members of Olson-type associations towards fellow members is higher than generalized trust towards general others. This supports *OLSON HYPOTHESIS B*.

As far as Residual associations are concerned, their members show patterns of trusting behavior in our experiments that are alike members of Putnam-type associations' both toward generalized others and fellow members.

The analysis of receivers' decisions brings about a surprising result. In this case members of Olson-type associations return significantly more than people from the general public, both when they are matched with fellow Olson-type members, and when they interact with people from the general public. The same pattern occurs for Residual association members who also show in-group favoritism, i.e. they return more to their fellow members than to people from the general public. By contrast, Putnam-type association members are no more trustworthy than people from the general public, either in the in-group, or in the out-group treatment.

Finally, we find a negative effect of the number of hours spent volunteering in the associations on trusting behavior of members of Olson-type association when paired with people from the general public. No other effect of the intensity of participation emerges.

The outline of the paper is as follows. Section 2 reviews the related literature on the relationship between association membership and trust. Section 3 summarizes the experimental design and describes our sample. Section 4 presents descriptive statistics. Section 5 is devoted to the econometric analysis. Section 6 concludes.

2. Related literature on the relationship between association membership and trust

In their cross-country survey analysis, Knack and Keefer (1997) find a negative, albeit insignificant, effect of Putnam-type associations on generalized trust, and a positive effect of Olson-type associations. They also find that Olson-type (Putnam-type) associations are positively (negatively) associated with an index of civic attitude. Knack (2003) uses a larger country coverage than Knack and Keefer (1997) and finds a positive effect of Putnam-type associations on generalized trust, while the effect of Olson-type associations is insignificant.[3] Other studies have used individual-level data to analyze the relationship between generalized trust and association membership distinguishing between different types of associations. Stolle and Rochon (1998) show that in 76.5% of the cultural associations they survey,[4] which are Putnam-type in character, members score significantly higher than non-members in an index based on questions on trust in others and on the frequency of interactions with neighbors, e.g. to borrow money or other items.

[3] Knack (2003) adopts the same classification used by Knack and Keefer (1997) with regard to Olson-type associations, while religious or church organizations are dropped from the Putnam-type associations where sport or recreation associations and local community action on issues like poverty, employment, housing, racial equality are included.

[4] According to Stolle and Rochon's classification, cultural associations include: associations for the preservation of traditional regional, national, or ethnic culture; church groups; literary, music, and art society. Members of this association type appear also to be characterized be high scores in indexes of Political Action, Political Trust and Optimism, Tolerance and Free-ridership (Stolle and Rochon, 1998).

They also find that members of as few as 30% of Olson-type associations[5] display higher levels of the previous index than non-members. Finally, as far as Residual associations are concerned, Stolle and Rochon (1998) find that 52.6% of Community groups' members and 57.9% of Private interest groups' members show higher levels of the index than non-members.[6] Wollebaek and Selle (2002) find that the percentage of respondents who say that "Most people can be trusted" is higher among members of Putnam-type associations (culture and recreational associations - 68% - and religious - 73%) and of Olson-type associations (parties and unions - 77%) than among non-affiliated (54%). However, the association type is not significant in explaining the presence of trustful members once multiple affiliations are considered as a control variable in a multivariate regression analysis. Stolle (1998) presents descriptive evidence detailing a higher level of generalized trust, measured through a set of trust questions, for members of sport associations and church choirs (Putnam-type association type) in comparison with customers of a commercial gymnasium. The latter are involved in activities similar to those of association members, but know each other less and spend less time together after joining the activity than association members.

Our study is innovative with respect to the existing literature because of its experimental character. This allows us to investigate the relationship between association membership and trust by using an experimental measure of trust and by taking into account both multiple membership and the effect of intensity of participation.

[5]They consider economic associations that include unions, employers' associations, professional associations, agricultural associations, consumer groups, cooperatives, shareholders' organizations. Members of this association type appear also to be characterized be high values of indices of Political Action and Political Trust.

[6] Community groups include: local actions groups, resident's associations, service and welfare organizations, health care groups, parents' associations, voluntary defense associations. Members of this association type seem to be also characterized be high values of indices of Political Action, Political Trust and Optimism, Tolerance and Free-ridership. Private interests groups include: sport, outdoor, youth, hobby, auto. members of this association type appear also to be characterized be high values of indices of Political Action, Political Trust and Optimism, Tolerance and Free-ridership.

3. Experimental design and sample

In our Trust Game experiment both senders and receivers are endowed with 25 euros (€). The sender is the first player to move. She has to decide how much of her initial endowment to send to the receiver, in multiples of 5€. So six transfer levels are possible (0, 5, 10, 15, 20 or 25€). The amount sent is doubled by the experimenter. The receiver has to decide how much of the amount in her possession after the sender's choice - i.e. the initial 25€, plus the amount sent by the sender and doubled by the experimenter - to send back to the first mover. We adopted the strategy method, so receivers had to indicate the amount they would like to return for each of the possible six options available to the sender.

The experiment was conducted between May and October 2011 at the University of Parma library. Recruited subjects were randomly assigned to two different groups prior to the session, and were summoned to two meeting points of the university. We took care that the two groups did not meet each other while they were conducted to two different rooms of the library. All sessions were run in parallel in the two rooms by the two researchers, following an identical script.

All subjects took two decisions, the first one as senders and the second one as receivers. When they took the first decision as senders, subjects did not know that they would have taken the second decision as receivers. Subjects present in one room were told that they would have been matched anonymously with another subject present in the other room. Pairs were changed after the first decision and no feedback was given at the end of each choice, so we consider the two choices as independent. Subjects were paid only for one decision, each of them having 50% probability of being drawn.

After the two experimental decisions, we elicited subjects' beliefs over sender and receiver behavior and we administered the post-experiment questionnaire. Payments were distributed in cash at the end of the session.

Sessions lasted on average 75 minutes. The average payoff was 31.7 Euros (std. dev. 11.99).

374 subjects took part in the experiment. 263 subjects were formally affiliated to a voluntary association, and attended meetings for at least one hour per month (*"members"* henceforth). They were recruited by the experimenters in ten different associations operating in the Province of Parma. Four were cultural associations (one ethnic and traditional dance association and three choirs). Following Knack and Keefer (1997), we classify them as Putnam-type associations. Two of the associations were trade unions, which we classify as Olson-type associations. Four associations were social welfare and health services associations (an association assisting hospitalized children, an association for medical research on cancer, the Italian association for blood donation and an association dedicated to charity and evangelization), which we classify as Residual associations.

111 participants were not formally affiliated at the time the research was conducted (non-members henceforth). 77 non-members had never been members in the past, while 34 non-members had been members of associations in the past but not at the moment of the experiment (dropouts). Since we never find differences between these two latter groups (see also Degli Antoni and Grimalda, 2013) we treat them as a single category in the rest of the analysis. Non-members were recruited by Demoskopea, one of the most well-known opinion polls and market research agency in Italy.[7] Contact with potential subjects was carried out in person by experimenters through announcements at association meetings and over the phone by Demoskopea staff. In spite of the different type of contact we requested that all announcements with potential subjects were made following an identical recruitment script. In this way, potential subjects were given exactly the same information prior to coming to the research sessions.

3.1 The in-group treatment sample

109 members took part in the in-group treatment. Table 1 reports the number of subjects from each association type.

[7] Four non-members were recruited by the experimenters to make up for no-shows.

Table 1 Number of subjects per association type – in-group

	In-group
Putnam-type	38
Olson-type	30
Residual	41

In the in-group treatment subjects were informed that they were paired with a member of the same association from which they had been contacted by the experimenters and that this subject was taking part to the session in the other room. The instructions read: *"The person with whom you will be paired is a member of the Association 'X' of which you are also a member, and is resident in Parma, or its province, or in neighbouring provinces. He was asked to take part in the research in a similar way to how you have been contacted"*. ('X' was the name of the association.)

3.2 The out-group treatment sample

265 subjects took part in the out-group treatment. They included all the 111 non-members and the remaining 154 members. Members were recruited by the experimenters in the same ten associations mentioned above except for 11 members who were recruited by Demoskopea.[8]

We operate a finer distinction in the out-group treatment than in the in-group with respect to assignment to association types. While in the in-group treatment we only take into account the association *where subjects had been recruited*, we consider *all associations of which a person is a member* for our analyses relative of the out-group treatment. This yields seven mutually exclusive categories: (1) People belonging to one type of association only – namely, people belonging to just Putnam-type associations (which we call "Putnam-type only" henceforth), or (2) just Olson-type associations ("Olson-type only" henceforth), or (3) just Residual associations ("Residual only"

[8] We had asked Demoskopea to recruit only non-members or dropouts. However, during the recruitment interview with Demoskopea, 11 subjects answered negatively to the screening question on whether a person is part of an association but they reported in the post-experiment questionnaire that they actually were association members. We suppose that this may be due to subjects' absent-mindedness when answering the recruitment interview, so we have decided to keep these 11 subjects in the sample as members. They have been classified as belonging to "other associations"

henceforth); People belonging to two types of associations – namely, (4) people belonging to Putnam-type and Olson-type associations ("Putnam-type & Olson-type" henceforth), or (5) to Putnam-type and Residual-type associations ("Putnam-type & Residual" henceforth), or (6) Olson-type and Residual-type associations ("Olson-type & Residual" henceforth); finally, (7) people belonging to all three types of association ("All types" henceforth).

The reason why we operate this finer distinction in the out-group treatment and not in the in-group is that in the latter treatment we only measure particularized trust, which strictly depends on the association where subjects have been recruited. In fact, members recruited from an association in the in-group treatment are paired with other members belonging to that same association. Conversely, generalized trust measured in the out-group treatment may be affected not only by membership in the association from where subjects were recruited, but also by the other different types of association where subjects were active.

Table 2 summarizes the size of association membership per type of association in the out-group treatment.

Table 2 Number of subjects per association type – out-group

	Out-group
Non-members	111
Putnam-type Only	29
Olson-type Only	30
Residual Only	34
Putnam & Olson-type	12
Putnam & Residual-type	25
Olson & Residual-type	12
All Types	11

The script in the out-group treatment read that more than a thousand people of different age and socio-economic conditions residents in the province of Parma and surrounding provinces had been contacted. Sessions in the out-group treatment comprised members coming from many different types of association, so most of the people part of this group would, with high probability, not be acquainted with each other. In the post-experiment questionnaire we asked subjects to state whether they thought they knew personally persons present in the other room. Around 7% (41%) of

members participating in the out-group (in-group) treatment answered positively to such question. This difference is statistically significant (P<0.001; Mann-Whitney test).

3.3 Sample properties

We test for the demographic comparability between the various member groups and non-member groups across the two treatments with Chi square and Wilcoxon non-parametric tests. We find two significant differences (Table 3). They concern the number of subjects who attained high-school diploma as their highest educational achievement among members of Residual associations in the two different treatments, and the satisfaction with personal financial situation as declared by the respondent between members and non-members. The latter is used as a proxy for the subject's economic condition. The econometric analysis will control for these differences.

Table 3 Balancing properties per experimental condition and type of association

	Age	*Female*	*Bachelor's_degree*	*Secondary_school*	*Income satisfaction*
H_0: Non-member = Members	1.522 (0.128)	0.0278 (0.868)	0.1840 (0.668)	1.4063 (0.236)	-2.941 (0.0033)
H_0: Members of Putnam-type associations (in-group) = Members of Putnam-type associations (out-group)	-1.008 (0.313)	0.1757 (0.675)	1.3271 (0.249)	0.2219 (0.638)	0.0341 (0.854)
H_0: Members of Olson-type associations (in-group) = Members of Olson-type associations (out-group)	-0.243 (0.8081)	2.0142 (0.156)	0.7629 (0.382)	2.5124 (0.113)	0.0770 (0.781)
H_0: Members of Residual associations (in-group) = Members of Residual associations (out-group)	1.683 (0.0924)	0.0049 (0.944)	1.2018 (0.273)	4.3787 (0.036)	0.0308 (0.8861)

*For continuous variables we tested - through nonparametric statistics - between-subject differences by using the Mann-Whitney test. For dichotomous variables we used the Chi square test to analyze the differences in proportions. P-value in squared brackets.

4. Empirical evidence

4.1. Descriptive statistics

Drawing on the same dataset used in this paper, Degli Antoni and Grimalda (2013) show that members send and return significantly more than non-members. The novelty of the present paper is to show that significant differences do emerge in this general pattern when we distinguish between Putnam-type, Olson-type and Residual associations. Tables 4 and 5 summarize descriptive statistics across treatment and per association type for the amount sent and the return rate respectively.

As far as the amount sent is considered (Table 4), descriptive statistics seem to reveal two main patterns, which are also confirmed by non-parametric tests:

1) Members of associations contribute significantly more than non-members in the out-group treatment in all cases but two. In both cases Olson-type associations are involved. Such are members of both Putnam-type and Olson-type associations (Mann-Whitney p=0.3266) and members of both Olson-type and Residual associations (Mann-Whitney p=0.8546).[9]
2) No difference emerges between the in-group and the out-group treatment in the amount sent by members of Putnam-type (Mann-Whitney p=0.5741), Olson-type (Mann-Whitney p=0.5147) and Residual (Mann-Whitney p=0.9125) associations. In order to analyze the existence of in-group/out-group effects we compare the difference in amounts sent for in-group members and out-group members who belong to strictly one association type.

[9] Differences between non-members and members of other combinations of associations as reported in Table 4 are always significant at the 5% level except when we consider members of Putnam-type, Olson-type and Residual where the level of significance is at the 10% level. The tests are available upon request.

Table 4 Amount sent across treatment and association membership

	Out-group		In-group	
	Median	Mean (Std.Dev)	Median	Mean (Std.Dev)
Non-members	10	10.496 (6.973)		
Members of Putnam-type only	15	15.172 (5.587)	15	14.342 (5.947)
Members of Olson-type only	15	14.5 (6.345)	15	15.833 (6.833)
Members of Residual only	15	15.441 (6.783)	15	15.610 (5.612)
Members of Putnam-type and Olson-type	12.5	12.917 (7.821)		
Members of Putnam-type and Residual	15	14.8 (6.994)		
Members of Olson-type and Residual	10	11.25 (6.440)		
Members of Putnam-type, Olson-type and Residual (All types)	15	14.091 (5.394)		
Members of at least one Putnam-type association	15	14.545 (6.344)		
Members of at least one Olson-type association	15	13.538 (6.479)		
Members of at least one Residual association	15	14.451 (6.667)		

Members of *at least one X association* identifies subjects who are members of at least one association of type X. For instance, members of at least one Olson-type association includes members of: Olson-type only; Putnam-type and Olson-type; Olson-type and Residual; All types.

As far as the amount returned is considered (Table 5 – we consider the average return rate on the six possible transfer rates available to the receiver in our Trust Game), descriptive statistics and non-parametric tests reveal that:

1. Members of all the different types of associations seem to return significantly more than non-members (this is also clearly shown in Figure 1). The statistical significance is stronger for members of Olson-type only associations (Mann-Whitney p=0.0025) and members of Residual-type only (Mann-Whitney p=0.0054) than for members of Putnam-type only (Mann-Whitney p=0.0256) associations. When we consider multiple associations versus non-membership, statistically significant differences emerge with respect to members of

Putnam-type and Residual (Mann-Whitney p=0.0199), at least one Putnam-type association (Mann-Whitney p=0.0029), at least one Olson-type association (Mann-Whitney p=0.0016) and at least one Residual association (Mann-Whitney p=0.0006).

2. No difference emerges between the in-group and the out-group treatment in the amount returned by members of Putnam-type (Mann-Whitney p=0.5145), Olson-type (Mann-Whitney p=0.7956) and Residual (Mann-Whitney p=0.1115) associations.

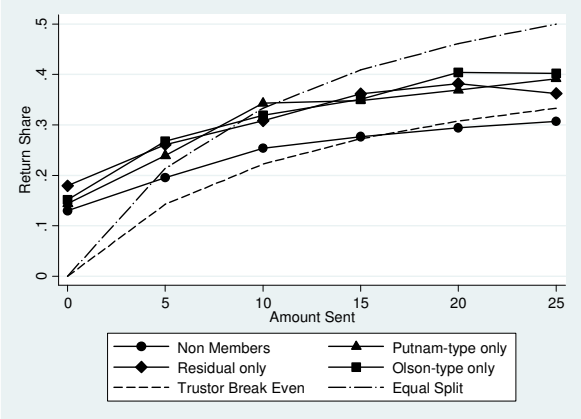
Table 5 Return rate across treatment and association membership
(average on six possible transfer rates)*

	Out-group		In-group	
	Median	Mean (Std.Dev)	Median	Mean (Std.Dev)
Non-members	0.219	0.243 (0.180)		
Members of Putnam-type only	0.282	0.301 (0.146)	0.285	0.277 (0.106)
Members of Olson-type only	0.295	0.349 (0.185)	0.319	0.331 (0.169)
Members of Residual only	0.318	0.313 (0.151)	0.331	0.398 (0.207)
Members of Putnam-type and Olson-type	0.261	0.282 (0.133)		
Members of Putnam-type and Residual	0.300	0.303 (0.119)		
Members of Olson-type and Residual	0.299	0.278 (0.082)		
Members of Putnam-type, Olson-type and Residual (All types)	0.282	0.339 (0.229)		
Members of at least one Putnam-type association	0.282	0.304 (0.149)		
Members of at least one Olson-type association	0.295	0.322 (0.170)		
Members of at least one Residual association	0.298	0.308 (0.146)		

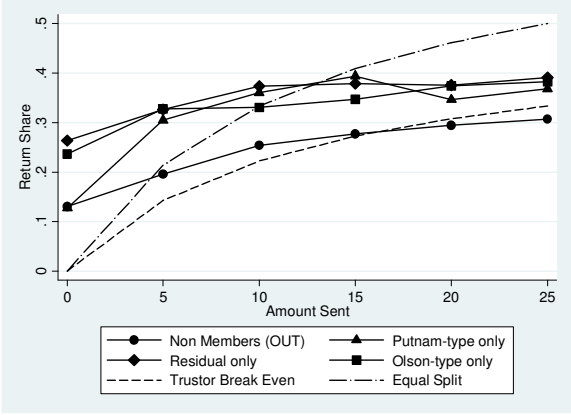
*In this table we consider the average return rate on the six possible transfer rates. Members of *at least one X association* identifies subjects who are members of at least one association of type X. For instance, members of at least one Olson-type association includes members of: Olson-type only; Putnam-type and Olson-type; Olson-type and Residual; All types.

Figure 1 Return share across treatment and association membership distinguishing between members of different types of associations and non-members

Association members and non-members return share in out-group treatment



Association members return share in in-group treatment (and non-members in out-group treatment)



4.2. Econometric analysis

In order to investigate the differences in choices by senders in consideration of their associational condition, we perform Ordered Logit estimates on the amount sent, which could vary between 0€ and 25€ in multiples of 5€. We define *Amount sent** a sender's unobservable willingness to trust others, modelled as a function of a vector of independent variables. The mapping between *Amount sent** and the variable we observe in the experiment, *Amount sent*, is then given by:

$$Amount\ sent_i^* = \alpha + G'_i\beta + X'_i\delta + \varepsilon_i \quad (1)$$

$$Amount\ sent_i = k \text{ if } m_{k-1} < Amount\ sent_i^* \leq m_k,\ k = 0,\ldots,K \quad (2)$$

α is a constant term. The index *i* denotes the individual. G_i is a vector which includes dummy variables identifying the types of association to which subjects belong. Variables included in vector G_i change across different specifications and are described in detail below. X_i is a vector including a wide array of control variables. It includes socio-demographic characteristics, such as age, sex, education, occupational condition, satisfaction with health and income, the propensity to take financial risk and controls connected with the experimental conditions, namely, a dummy identifying the two experimenters who led the sessions in two different rooms and the number of errors in the comprehension questions. Finally, the vector X_i also includes a dummy variable

identifying dropouts, which is never different from other non-members. The description of these variables is reported in Appendix A. β and δ are vectors of parameters of interest, and ε_i is the error term, assumed to be distributed according to a standardised Logistic distribution $\varepsilon_i \sim Logistic(0,1)$. The index k represents the discrete possible amounts sent and K the total number of categories. In our experiment, K=6. m_k are the (unobservable) cutoff points in the domain of *Amount sent*$_i$* at which the individual desires to switch to a higher *Amount sent*$_i$. We make the usual normalisation, $m_{-1}=-\infty$, $m_0=0$, and $m_k=+\infty$.

In order to investigate the effect of associational membership on receivers' decision, we fit a Tobit model where the dependent variable is the return rate. The receiver could return any amount ranging from zero up to a maximum given by the sum of the receiver's initial endowment (25€) and twice the amount sent to her by the sender. Returns were allowed up to the first decimal digit. We normalize this variable to the [0,1] interval by dividing it by the maximum possible amount that receivers may send back. We call this variable *Return rate*.

The econometric analysis of the *Return rate* is based on the following Tobit model with random effects:

$$Return\ rate_i^* = \gamma_0 + \gamma_1 Amount\ sent_j + \gamma_2 (Amount\ sent_j)^2 + G'_i\beta + X'_i\delta + \vartheta_i + \theta_{ai} \qquad (3)$$

$$Return\ rate_i = \begin{cases} 1 & \text{if } Return\ rate_i^* \geq 1 \\ Return\ rate_i^* & \text{if } 0 < Return\ rate_i^* < 1 \\ 0 & \text{if } Return\ rate_i^* \leq 0 \end{cases} \qquad (4)$$

Eq. (3) describes an individual's latent propensity to send back to the sender a share of the money in her possession. This is modelled as a function of *Amount sent*$_j$ (where the index j indicates the individual with which individual i is paired). G_i and X_i includes the same variables of interest and control variables used in the Ordered Logit estimates. β and δ denote vectors of parameters. Finally, ϑ_i *and* θ_{ai} are an individual-specific and an idiosyncratic error term, respectively. The quadratic form in *Amount sent*$_j$ is added to capture possible non-linearities in the way receivers respond to the

amount received (Bellemare and Kröger, 2007). Eq. (4) presents the censoring rules that force receiver with either extremely high or extremely low propensity to send back money to return a rate of one or zero, respectively, with positive probability.

First, we examine whether members of different types of associations showed different patterns of behavior in relation to non-members in the in-group treatment (Table 6, column 1). Amounts sent by members are significantly higher than the amounts sent by non-members when members interact with fellow members for any of the three association types (*Putnam-type_Ing*; *Olson-type_Ing* and *Residual_Ing*; $p<0.01$ in all three cases - Table 6, column 1). When association members interact with people from the general population in the out-group treatment, we find that people who are member of only Olson-type associations (*Olson-type_Only_Out*) do not show any significant difference in their amount sent in comparison with non-members ($p=0.116$ - Table 6, column 1). On the contrary, both members of only Putnam-type associations (*Putnam-type_Only_Out*) and only Residual associations (*Residual_Only_Out*) do show significantly higher amount sent than non-members ($p=0.020$ for Putnam-type associations; $p=0.010$ for Residual associations - Table 6, column 1). Interestingly enough, people who are members of both Putnam-type and Residual associations (*Putnam-type_&_Residual_Out*) send significantly higher amounts than non-members ($p=0.011$), while in cases in which individuals are involved with two associations and one of them is Olson-type (*Putnam-type_&_Olson-type_out, Olson-type_&_Residual_out*), their amount sent is not significantly different from non-members (Table 6, column 1). When we consider members of all association types (*All_Types_Out*) we find that they send more than non-members, but only at a weak level of significance ($p=0.093$). We conclude:

Result 1: *Previous evidence support both the PUTNAM HYPOTHESIS A, according to which members of Putnam-type associations are expected to show higher level of generalized trust than non-members, and the OLSON HYPOTHESIS A, according to which members of Olson-type associations are not expected to be endowed with higher generalized trust than non-members.*

Second, we test for in-group favoritism for each of the association types. We start comparing the difference in the amount sent for in-group members and out-group members who belong to strictly one association type (Table 6, column 1). These three tests fail to reject the null hypothesis of equality of coefficients for all three association types, even though the level of significance for members of Olson-type associations is not far from 10% (p=0.673 for Putnam-type; p=0.252 for Residual associations; p=0.110 for Olson-type associations). The failure to reject the null for the in-group effect may be caused by the regression coefficients being estimated with less precision due to the increased number of categories used to control for multiple membership in the out-group treatment. For this reason we run three further regressions where we introduce a dummy identifying all cases in which a subject is a member of *at least* one certain type of association. For instance, the dummy *At_Least_One_Putnam-type_Out* includes the four categories formed by: {*Putnam-type_Only_Out*; *Olson-type_&_Putnam-type_Out*; *Putnam-type_&_Residuals_Out*; *All_Types_Out*}. We also run analogous regressions using *At_Least_One_Residual_Out* (Table 6, column 3) and *At_Least_One_Olson-type_Out* (Table 6, column 4). Note that the previous result 1 holds when we use members of "at least one type of association" instead of strictly one type of association. When we consider members of at least one Olson-type association, the difference between sending directed to fellow members and sending towards the general population by people who are member of at least one Olson-type association is strongly significant (p=0.006) (Table 6, column 4). Members of at least one Residual association show in-group favoritism only at weak levels of significance (p=0.063) (Table 6, column 3), but no effect emerges for Putnam-type associations (p=0.850) (Table 6, column 2). We conclude:

Result 2: *The comparison between behavior in the in-group and out-group treatments seems to support only the OLSON HYPOTHESIS B: members of Olson-type associations reveal higher levels of particularized trust than generalized trust. By contrast we find that members of Putnam-type associations do not.*

With respect to the effect of socio-demographic controls on the amount sent, we find: a) a non-linear effect of the participant's age; b) that women send significantly less than men; c) that dissatisfaction with one's income has a negative effect on the amount sent; d) that people born in the South of Italy send less than people born in other areas; e) people who declare to believe in God, rather than being agnostic or atheists, send significantly less than others.

When we look at return rates across association types, we find that members of both Residual and Olson-type associations return significantly more than non-members, both when they are matched with fellow members (*Residual_Ing* p=0.001 and *Olson-type_Ing*, p=0.022, Table 6, column 5), and when they interact with people from the general population (*Residual_Only_Out* p=0.044 and *Olson-type_Only_Out* p=0.013 - Table 6, column 5). Perhaps surprisingly, Putnam-type association members are no more trustworthy than non-members, either in the in-group (*Putnam-type_Ing*, p=0.294), or in the out-group treatment (*Putnam-type_Only_Out*, p=0.582). The same results hold if we use members of "at least one type of association" instead of strictly one type of association.

Only Residual association members show some significant differences in behavior between the in-group and out-group treatment. This is the case both when members of strictly Residual associations are considered (p=0.088 – Table 6, column 5) and when members of at least one Residual associations are considered (p=0.021 Table 6, column 8). With respect to our third research question, namely, how members of different types of association behave when acting in response to a previous decision by another (trusting) subject, we conclude that:

Result 3: *Members of Residual and Olson-type associations result as more trustworthy than non-members both in the in-group and the out-group treatment, while Putnam-type association members' return rates are indistinguishable from non-members; in-group favouritism only emerges for Residual association members.*

Among the controls, we find a non-linear effect of the amount received by the sender; that people born in the South and retired persons return significantly less; a negative effect of the

number of family members. We also find a positive effect of the numbers of mistakes in the experiment comprehension test.[10] We then explored possible differences in the effect of mistakes on the amount returned between the different association types. For this purpose we interact mistakes with each single dummy variable identifying the different association types (Table 6, column 6). Since the F-test on the null hypothesis that the coefficients of these interaction terms were jointly equal to 0 is not rejected (p=0.6399), we conclude that no significant differences emerged in the way mistakes affect our dependent variable across groups of members.

Finally, we analyze if the intensity of participation in different types of associations has an effect on trusting and trustworthy behavior of members. We consider the number of hours actually spent volunteering with associations and the number of associations joined by members. In both cases, we include in the regressions the dummy variables identifying membership in the different types of associations. Indeed, the coefficients of the variables measuring the intensity effect reveal the effect of the intensity net of the effect of the mere participation.

First we focus on the number of hours spent volunteering with associations of different types (defined as *Hours*). In regard with subjects involved in the in-group treatment, we considered the number of hours spent in the associations where they had been recruited. This was a natural choice, since these associations are those used to create the in-group condition (see section 3). With respect to subjects in the out-group condition, we restricted the analysis to members who belong strictly to one type of association. In fact, in case of members belonging to more than one association type, we are not able to impute the hours spent volunteering to the type of association where these have been spent.[11] The number of hours spent volunteering is never significant when we consider subjects in the in-group treatment belonging to the three different types of associations (*Hours_ Putnam-*

[10] The *Mistakes* variable measures the number of mistakes in the 6-question comprehension quiz administered after the instructions. We preferred not to ask subjects to re-answer the questions in case of mistakes in the comprehension quiz, because we thought this would have conveyed the impression that subjects had "to pass an exam" to qualify for the experiment. This would have likely sounded unnatural and stressful for many subjects. We preferred to collect subjects' answers, and use the number of mistakes in the quizzes as a covariate in the econometric analysis.

[11] Asking the number of hours spent volunteering in each association would have of course been interesting, but the overall length of the questionnaire prevented us from doing that.

type_Ing, Hours_ Residual_Ing, Hours_ Olson-type_Ing) (Table 7, column 1). In the out-group treatment, the number of hours is not significant either for Putnam-type (*Hours_ Putnam-type_Only_Out*, p=0.103) or for Residual associations (*Hours_ Residual_Only_Out*) (p=0.420), but has a negative and significant effect for Olson-type associations (*Hours_ Olson-type_Only_Out*) (p=0.022) (Table 7, column 1).

As for the relationship between *Hours* and members behavior when acting as Receiver, we do not detect any significant effect (Table 7, column 2).

A second analysis related to the intensity of the associational life, reveals that the number of associations joined by members (*Number_ Putnam-type_Out, Number_ Residual_Out, Number_ Olson-type_Out*) does not affect the amounts sent (Table 8, column 1).

As for return rates, we do not detect any significant effect of number of associations on trustworthiness in this case, either (Table 8, column 2).

In conclusion, we do not find evidence of a clear effect of intensity of participation on the level of trust and trustworthiness of members of different types of associations. We only find an effect of the intensity of participation in relation to the number of hours spent volunteering in associations, showing a negative effect of the number of hours spent volunteering on trust of members of Olson-type associations when they are paired with people from the general public.

5. Conclusions

Putnam's hypothesis on the positive effect of associational participation on spirit of cooperation conflicts with Olson's hypothesis, which sees voluntary groups as pursuing private interests and setting up activities conducive to rent-seeking behavior. The existing empirical literature, based on survey data, provides only mixed evidence that is not conclusive on the Putnam vs. Olson debate. Moreover, the lack of experimental studies on this issue is particularly critical, since survey questions on trust and cooperative behavior are characterized by commonly recognized interpretative problems. By distinguishing between different types of associations, we provide the

first experimental analysis on trust and trustworthiness of members of Putnam-type and Olson-type associations when paired with fellow members and with people from the general population and we compare members' behavior with that of non-members.

First, we find that members of Putnam-type associations trust people from the general public significantly more than non-members. Moreover, they do not discriminate between fellow members and people from the general population. The latter result opens interesting questions for further research revealing that direct and indirect reciprocity, reputation and sanctioning, which should have a specific effect on spirit of cooperation *within* associations, are not relevant when Putnam-type associations are considered. Second, members of Olson-type associations trust people from the general population in the same way as non-members do. Moreover, they trust fellow members more than people from the general population.

As far as receivers' behavior is concerned, we note that members of Olson-type associations return significantly more than non-members, both when they are paired with fellow Olson-type members, and when they are matched with people from the general public, and without in-group effect. Conversely, Putnam-type association members are no more trustworthy than people from the general population, either when they are paired with fellow members or when they interact with people from the general population. This is a particularly original and interesting result. It highlights that membership in different types of associations may be associated with patterns of behavior that vary significantly when different motivational drivers are analyzed. It also indirectly confirms previous evidence that different models must explain trust and trustworthiness (Johnson and Mislin, 2011; Sapienza et al., 2013).

We also show that the intensity of participation presents only a significant effect. In particular, we find a negative effect of the number of hours spent volunteering in the associations on trusting behavior of members of Olson-type association when paired with people from the general public. This is consistent with the idea that social relationships in Olson-type associations lead primarily to "bonding" rather than "bridging" social capital (Putnam, 2000).

Finally, we analyze behavior of members of Residual associations with respect to the Olson vs. Putnam distinction. As members of Putnam-type associations, these subjects trust people from the general public significantly more than non-members. However, as members of Olson-type association, they trust fellow members more than people from the general population. When acting as receivers, members of Residual associations behave as Olson-type members. No significant effect of the intensity of participation on members of Residual associations emerges.

Our contrasting evidence on the behavior of members of Putnam-type and Olson-type associations when acting as sender or receiver in a Trust Game experiment opens interesting questions for further research. How do members of different types of association behave when the context of interaction does not ask mainly for trust but for other types of motivational driver? In this perspective, it would be useful to replicate experimental analysis involving associational members in different games, such as Public Good Games, Ultimatum Game and Dictator Game.

Table 6 Analysis of amounts sent and return rates: effects of association type

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dependent variable	*Amount sent*	*Amount sent*	*Amount sent*	*Amount sent*	*Return rate*	*Return rate*	*Return rate*	*Return rate*
Model	Ordered Logit	Ordered Logit	Ordered Logit	Ordered Logit	Tobit	Tobit	Tobit	Tobit
Putnam-type_Ing	1.041***	0.966**	1.000***	1.027***	0.041	0.041	0.039	0.042
	(0.386)	(0.379)	(0.381)	(0.381)	(0.039)	(0.037)	(0.035)	(0.036)
Residual_Ing	1.754***	1.678***	1.668***	1.711***	0.172***	0.170***	0.168***	0.170***
	(0.430)	(0.426)	(0.421)	(0.426)	(0.050)	(0.048)	(0.049)	(0.047)
Olson-type_Ing	1.767***	1.826***	1.789***	1.746***	0.114**	0.115**	0.115**	0.110**
	(0.488)	(0.483)	(0.486)	(0.486)	(0.050)	(0.046)	(0.047)	(0.047)
Putnam-type_Only_Out	1.272**		1.248**	1.287**	0.029		0.028	0.035
	(0.547)		(0.536)	(0.541)	(0.053)		(0.050)	(0.053)
Residual_Only_Out	1.202**	1.151**		1.182**	0.085**	0.084**		0.084**
	(0.468)	(0.462)		(0.463)	(0.042)	(0.042)		(0.042)
Olson-type_Only_Out	0.848	0.870	0.852		(0.125)**	0.124**	0.124***	
	(0.540)	(0.538)	(0.540)		(0.050)	(0.049)	(0.048)	
Putnam-type_&_Olson-type_Out	-0.083		-0.051		0.038		0.039	
	(0.645)		(0.636)		(0.049)		(0.046)	
Putnam-type_&_Residual_Out	1.186**			1.174**	0.081**			0.084**
	(0.469)			(0.461)	(0.039)			(0.038)
Olson-type_&_Residual_Out	-0.035	-0.043			0.017	0.018		
	(0.622)	0.618)			(0.056)	(0.055)		
All_Types_Out	0.808*				0.042			
	(0.481)				(0.061)			
At_Least_One_Putnam-type_Out		0.893**				0.050		
		(0.354)				(0.032)		
At_Least_One_Residual_Out			0.954***				0.069**	
			(0.343)				(0.031)	
At_Least_One_Olson-type_Out				0.496				0.075**
				(0.374)				(0.034)
Dropout	-0.228	-0.225	-0.230	-0.230	0.000	0.000	0.000	0.000
	(0.511)	(0.504)	(0.503)	(0.505)	(0.046)	(0.043)	(0.042)	(0.044)

Table 6 (continued)

Amount sent					0.029***	0.029***	0.029***	0.029***
					(0.002)	(0.002)	(0.002)	(0.002)
Amount sent Square					-0.001***	-0.001***	-0.001***	-0.001***
					(0.000)	(0.000)	(0.000)	(0.000)
Female	-0.534**	-0.475*	-0.525**	-0.545**	-0.036	-0.037	-0.037	-0.040
	(0.259)	(0.254)	(0.255)	(0.259)	(0.026)	(0.024)	(0.025)	(0.024)
Age	0.154**	0.151**	0.140**	0.149**	0.008	0.007	0.007	0.007
	(0.071)	(0.071)	(0.069)	(0.0701)	(0.006)	(0.006)	(0.006)	(0.006)
Age Squared	-0.002**	-0.002**	-0.002**	-0.00167**	0.000	0.000	0.000	0.000
	(0.001)	(0.001)	(0.001)	(0.000740)	(0.000)	(0.000)	(0.000)	(0.000)
Income_dissatisfaction	-0.570*	-0.606**	-0.610**	-0.595**	0.015	0.016	0.012	0.015
	(0.292)	(0.290)	(0.291)	(0.291)	(0.031)	(0.031)	(0.032)	(0.030)
South	-1.077***	-1.166***	-1.087***	-1.097***	-0.099***	-0.100***	-0.101***	-0.106***
	(0.379)	(0.365)	(0.370)	(0.369)	(0.032)	(0.032)	(0.033)	(0.031)
Town-size	0.127	0.150	0.106	0.0952	0.028	0.025	0.026	0.022
	(0.239)	(0.232)	(0.238)	(0.239)	(0.022)	(0.021)	(0.021)	(0.021)
Bachelor's_degree	0.624*	0.559	0.579	0.544	-0.004	-0.003	-0.005	-0.010
	(0.358)	(0.358)	(0.355)	(0.343)	(0.036)	(0.034)	(0.034)	(0.034)
Secondary_school	0.326	0.248	0.322	0.279	0.010	0.009	0.011	0.009
	(0.293)	(0.284)	(0.297)	(0.288)	(0.032)	(0.030)	(0.030)	(0.031)
Retired	0.268*	0.308	0.289	0.314	-0.074*	-0.076*	-0.073*	-0.070*
	(0.379)	(0.375)	(0.374)	(0.374)	(0.040)	(0.040)	(0.041)	(0.040)
Unemployed	-1.186	-1.132*	-1.125	-1.133	0.027	0.030	0.031	0.033
	(0.690)	(0.683)	(0.684)	(0.711)	(0.064)	(0.062)	(0.063)	(0.063)
Family_size	-0.112	-0.119	-0.108	-0.117	-0.014*	-0.014*	-0.014*	-0.014*
	(0.075)	(0.075)	(0.075)	(0.0741)	(0.007)	(0.008)	(0.007)	(0.007)
Unmarried	-0.506	-0.409	-0.483	-0.471	-0.025	-0.025	-0.024	-0.028
	(0.355)	(0.343)	(0.352)	(0.349)	(0.029)	(0.027)	(0.026)	(0.027)
Only_Child	-0.135	-0.117	-0.154	-0.136	0.005	0.004	0.002	0.001
	(0.274)	(0.274)	(0.283)	(0.280)	(0.027)	(0.025)	(0.027)	(0.028)
Believer	-0.992***	-0.927***	-0.960***	-0.976***	-0.043	-0.041	-0.041	0.041
	(0.333)	(0.328)	(0.327)	(0.331)	(0.026)	(0.025)	(0.026)	(0.027)

Table 6 (continued)

Practicing	0.348	0.386	0.398	0.347	0.037	0.040	0.039	0.034
	(0.306)	(0.307)	(0.306)	(0.301)	(0.026)	(0.025)	(0.026)	(0.027)
Divorced	0.033	0.012	-0.040	0.0844	-0.018	-0.015	-0.021	-0.007
	(0.611)	(0.605)	(0.572)	(0.584)	(0.090)	(0.093)	(0.090)	(0.094)
Health_satisfaction	0.047	0.060	0.061	0.0662	0.020	0.020	0.021	0.021
	(0.152)	(0.153)	(0.156)	(0.153)	(0.017)	(0.017)	(0.017)	(0.017)
Risfin	0.084	0.087	0.087*	0.0878*	-0.005	-0.005	-0.005	-0.005
	(0.052)	(0.053)	(0.052)	(0.0527)	(0.005)	(0.005)	(0.005)	(0.006)
Mistakes	-0.009	-0.022	-0.011	-0.0151	0.018**	0.017**	0.017**	0.017**
	(0.080)	(0.077)	(0.078)	(0.0764)	(0.008)	(0.008)	(0.008)	(0.008)
Experimenter	0.375	0.400*	0.384*	0.371	0.032	0.031	0.033	0.032
	(0.230)	(0.229)	(0.223)	(0.229)	(0.023)	(0.022)	(0.022)	(0.022)
Other_Associations	-1.397*	-1.108*	-1.391**	-1.429**	0.004	0.003	0.003	-0.006
	(0.730)	(0.643)	(0.636)	(0.697)	(0.051)	(0.050)	(0.051)	(0.053)
Constant	*Constants omitted*	*Constants omitted*	*Constants omitted*	*Constants omitted*	-0.235	-0.213	-0.220	-0.209
					(0.161)	(0.158)	(0.150)	(0.155)
Observations	319	319	319	319	1914	1914	1914	1914
Pseudo R2	0.0967	0.0930	0.0936	0.0940				
sigma_u					0.159	0.159	0.160	0.160
sigma_e					0.148	0.148	0.148	0.148
chi2					431.8	438.1	458.6	424.9

Notes: *Putnam-type_Ing, Residual_Ing* and *Olson-type_Ing* identifies subjects involved in the in-group treatment and recruited in Putnam-type, Residual and Olson-type associations respectively. Variables denoted by *X_Only_Out*, X={Putnam-type, Residual, Olson-type} identify subjects who are members of type of association X in the out-group treatment. X_1*_&_* X_2*_Out*, X_1= X; X_2=X; identify subjects who, in the out-group treatment, are members of both association types X_1 & X_2 , but are not member of the third association type, where X_1 and X_2 identify different types. For instance, *Putnam-type_&_Residual_Out* identifies members who belong to at least one Putnam-type association, at least one Residual association, but are not members of Olson-type associations. *All_Types_Out* identifies subjects who are members of all three types of association in the *out-group* treatment. Finally, *At_Least_One_X_Out* identifies subjects who are members of at least one association of type X. For instance, *At_Least_One_Olson-type_Out* includes the four categories: {Olson-type_Only_Out; Olson-type_&_Putnam-type_Out; Olson-type_&_Residual_Out; All_Types_Out}. Robust standard errors (columns 1,2,3, and 4) and bootstrapped standard errors generated in 1000 repetitions (columns 5,6,7, and 8) are reported in parentheses; *** p<0.01, ** p<0.05, * p<0.1. See Appendix A for the description of the control variables included in the regressions.

Table 7 Analysis of amounts sent and return rates: Effects of length of hours spent in association per week

	(1)	(2)
Dependent Variable	*Amount sent*	*Return rate*
Hours_ Putnam-type_Ing	0.002	0.000
	(0.005)	(0.000)
Hours_ Residual_Ing	0.001	0.000
	(0.003)	(0.001)
Hours_ Olson-type_Ing	-0.013	0.001
	(0.009)	(0.001)
Hours_ Putnam-type_Out	-0.296	-0.007
	(0.182)	(0.039)
Hours_ Residual_Out	-0.068	-0.006
	(0.084)	(0.006)
Hours_ Olson-type_Out	-0.235**	0.002
	(0.102)	(0.019)
Putnam-type_Ing	1.139	0.004
	(0.946)	(0.083)
Residual_Ing	1.539***	0.174***
	(0.547)	(0.063)
Olson-type_Ing	2.599***	-0.014
	(0.631)	(0.085)
Putnam-type_Only_Out	2.212	0.007
	(1.473)	(0.172)
Residual_Only_Out	1.258	0.071
	(0.899)	(0.057)
Olson-type_Only_Out	1.896***	0.107
	(0.659)	(0.065)
Dropout	-0.426	-0.033
	(0.528)	(0.041)
Amount sent		0.030***
		(0.002)
Amount sent Square		-0.001***
		(0.000)
Female	-0.722**	-0.061**
	(0.320)	(0.030)
Age	0.067	0.004
	(0.092)	(0.009)
Age Squared	-0.001	0.000
	(0.001)	(0.000)
Income_dissatisfaction	-0.323	0.019
	(0.318)	(0.040)
South	-1.109***	-0.131***
	(0.404)	(0.040)
Town-size	-0.046	0.039
	(0.274)	(0.027)

Table 7 (continued)

Bachelor's_degree	1.119***	0.040
	(0.407)	(0.046)
Secondary_school	0.562	0.051
	(0.369)	(0.040)
Retired	0.048***	-0.126*
	(0.534)	(0.068)
Unemployed	-2.166	-0.048
	(0.716)	(0.075)
Family_size	-0.139	-0.023*
	(0.135)	(0.012)
Unmarried	-0.668	-0.035
	(0.444)	(0.033)
Only_Child	-0.057	0.035
	(0.299)	(0.034)
Believer	-1.439***	-0.070**
	(0.381)	(0.032)
Practicing	0.884**	0.031
	(0.344)	(0.034)
Divorced	-0.397	0.009
	(0.707)	(0.113)
Health_satisfaction	0.254	0.022
	(0.183)	(0.021)
Risfin	0.079	-0.011**
	(0.062)	(0.005)
Mistakes	-0.009	0.023**
	(0.094)	(0.010)
Experimenter	0.155	0.033
	(0.270)	(0.025)
Constant	*Constants*	-0.108
	omitted	(0.211)
Observations	232	1392
Pseudo R2	0.1299	
sigma_u		0.161
sigma_e		0.132
chi2		411.2

Notes: see Table 6. Variables whose name starts with "Hours" measure the number of hours per week spent volunteering in the type of association specified by the variable name. For example, *Hours_ Olson-type_Out* measures the number of hours spent volunteering per week in Olson-type associations by members involved in the out-group treatment. Robust standard errors (column 1) and bootstrapped standard errors generated in 1000 repetitions (column 2) are reported in parentheses; ***; *** p<0.01, ** p<0.05, * p<0.1. We omitted the variable *Other_Associations* because of problems of multi-collinearity. See Appendix A for the description of all the control variables included in the regressions.

Table 8 Analysis of amounts sent and return rates: Effects of number of joined associations

Dependent variable:	(1) *Amount sent*	(2) *Return rate*
Putnam-type_Ing	1.034***	0.039
	(0.387)	(0.037)
Residual_Ing	1.746***	0.169***
	(0.431)	(0.047)
Olson-type_Ing	1.778***	0.115**
	(0.492)	(0.049)
Number_ Putnam-type_Out	-0.099	-0.051
	(0.465)	(0.033)
Number_ Residual_Out	0.145	0.023
	(0.160)	(0.021)
Number_ Olson-type_Out	0.025	0.051
	(1.013)	(0.068)
Putnam-type_Only_Out	1.388*	0.090
	(0.814)	(0.069)
Residual_Only_Out	0.980*	0.051
	(0.591)	(0.053)
Olson-type_Only_Out	0.822	0.062
	(1.267)	(0.086)
Putnam-type_&_Olson-type_Out	0.007	0.039
	(1.165)	(0.107)
Putnam-type_&_Residual_Out	1.139	0.132*
	(1.064)	(0.074)
Olson-type_&_Residual_Out	-0.236	-0.070
	(1.490)	(0.101)
All_Types_Out	0.726	0.039
	(1.524)	(0.127)
Dropout	-0.230	0.001
	(0.511)	(0.046)
Amount sent		0.029***
		(0.002)
Amount sent Square		-0.001***
		(0.000)
Female	-0.533**	-0.038
	(0.259)	(0.025)
Age	0.152**	0.008
	(0.072)	(0.006)
Age Squared	-0.002**	0.000
	(0.001)	(0.000)
Income_dissatisfaction	-0.578**	0.011
	(0.294)	(0.031)
South	-1.075***	-0.101***
	(0.381)	(0.032)

Table 8 (continued)

Town-size	0.126	0.028
	(0.239)	(0.021)
Bachelor's_degree	0.620*	-0.008
	(0.356)	(0.034)
Secondary_school	0.327	0.010
	(0.295)	(0.030)
Retired	0.269	-0.070
	(0.388)	(0.043)
Unemployed	-1.187*	0.033
	(0.704)	(0.062)
Family_size	-0.112	-0.014*
	(0.075)	(0.008)
Unmarried	-0.496	-0.025
	(0.363)	(0.027)
Only_Child	-0.148	0.001
	(0.275)	(0.028)
Believer	-0.967***	-0.036
	(0.345)	(0.027)
Practicing	0.348	0.039
	(0.306)	(0.026)
Divorced	0.047	-0.010
	(0.619)	(0.089)
Health_satisfaction	0.042	0.019
	(0.156)	(0.017)
Risfin	0.085	-0.005
	(0.054)	(0.006)
Mistakes	-0.012	0.017**
	(0.080)	(0.008)
Experimenter	0.368	0.032
	(0.231)	(0.022)
Other_Associations	-1.396*	-0.002
	(0.767)	(0.052)
Constant		-0.229
		(0.156)
Observations	319	1914
Pseudo R2	0.0971	
sigma_u		0.158
sigma_e		0.148
chi2		475.5

Notes: see Table 6. Variables whose name starts with "Number" measure the number of associations of the type specified by the variable name joined by the subject. For example, *Number_Putnam-type_Out* measures the number of Putnam-type associations joined by subjects involved in the out-group treatment. Robust standard errors (column 1) and bootstrapped standard errors generated in 1000 repetitions (column 2) are reported in parentheses; *** p<0.01, ** p<0.05, * p<0.1. See Appendix A for the description of the control variables included in the regressions.

APPENDIX A

Table A1
Variables description

Age	Subject's age
Female	Dummy Variable (DV) taking value one (=1) if the respondent is a female
Dropout	DV=1 if the respondent had been member of an association in the past
Income_dissatisfaction	DV=1 if the answer to the questions "How well would you say that you are doing financially these days?" is "Living in a comfortable way". Other possible answers: "Living in an acceptable way"; "Barely getting by"; "It goes really badly"
Town_size	DV=1 if the town where the respondent lives has more than 100.000 inhabitants
South	DV =1 if the respondent was born in the South of Italy
Bachelor's_degree	DV =1 if the respondent has a university degree or higher title
Secondary_school	DV=1 if the respondent has attained high-school diploma ("Maturità" or "Licenza" in the Italian education system) as their highest educational achievement.
Retired	DV=1 if the respondent is retired
Unenmployed	DV=1 if the respondent is unemployed
Family_size	Number of family members
Unmarried	DV=1 if the respondent is single
Only_child	DV=1 if the respondent is an only child
Believer	DV=1 if the respondent states s/he is not atheist nor agnostic
Practicing	DV=1 if the respondent is a church-goer, i.e. s/he attends religious services at least once a month
Divorced	DV=1 if the respondent is divorced
Health_satisfaction	DV=1 if the respondent declares to be very satisfied with his/her health condition
Risfin	variable measuring the general willingness of the respondent in taking financial risk (it takes integer values from 1 to 10). We used the measure of risk aversion based on a question in the survey (Are you generally a person who is fully prepared to take risks or do you try to avoid taking risks? Please tick a box on the scale, where the value 0 means: 'unwilling to take risks' and 10: 'fully prepared to take risk'), which proved to be a good measure of risk aversion (see Dohmen et al., 2011).
Mistakes	Numbers of mistakes in the experiment comprehension test
Experimenter	dummy variable which distinguishes between the two experimenters who conducted all the experimental sessions
Other_Associations	11 members were inadvertently recruited by Demoskopea, and classified as belonging to "other associations" (see footnote 8).

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