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Social Preferences in Inter-Group Conflict ☆

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Abstract

Identifying who engages in inter-group conflict – and if they do so why – may help to predict and potentially prevent inter-group conflicts. Yet, little is known about the heterogeneity of individuals' social preferences in inter-group conflict. We derive a typology and measure of group-dependent social preferences from a social preference model. We gather representative, incentivized field data before and after the heated 2016 Austrian presidential election. We find considerable heterogeneity in individuals' social preferences. Out-group spitefulness is associated with higher age and group identity as well as lower education and in-group prosociality. Group-dependent social preferences predict voting decisions.

Keywords: group conflict, social preferences, parochial altruism, parochial egoism, in-group favoritism, field-experiment, identity economics
JEL: C93, D72, D74

1. Introduction

Inter-group conflicts are omnipresent and can be observed between various types of groups, e.g., nations and ethnic, religious, or political groups, but also within and between companies or universities. Inter-group conflict may take different forms and use different means, ranging from subtle discrimination against out-group members in everyday life to large-scale and violent encounters in wars. For instance, there are about 150,000 people killed in violent inter-group conflicts annually, with drastically increasing numbers of casualties from global terrorism (Institute for Economics & Peace, 2015, 2016). Moreover, it has been estimated that the costs associated with violent inter-group conflict (e.g., salaries for armed forces personnel, military expenditures) in 2015 were about 13.3% of the world GDP (Institute for Economics & Peace, 2016). As these figures impressively show, inter-group conflicts affect the way in which we live together, they endanger health or even life, and they influence economic outcomes including the reduction of welfare (Kelly, 2005; Abbink et al., 2010; Fry and Söderberg, 2013).

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In order to reduce inter-group conflict, it is important to understand the individual motivations that lead to conflict engagement in the first place. Clearly, the group that is able to mobilize more members to engage in inter-group conflict is more likely to be victorious. However, inter-group conflict is costly to the participating individuals (e.g., time, risk of injury or death), whereas the outcomes – either gains or losses (e.g., power, territory) – are often shared equally among all in-group members, largely independent of their individual contributions. Hence, the situation is well described as a multi-level social dilemma, in which the intra-group conflict is embedded in the inter-group conflict (e.g. Bornstein, 2003; Boyd and Richerson, 2009; Henrich, 2004; Darwin, 1871/2009). As a consequence of the social dilemma structure, individuals' conflict engagement should be at least partly related to their social preferences: contribution to inter-group conflict is a prosocial act toward the in-group members, whereas non-contribution is egoistically rational but also a prosocial act toward the out-group members. Hence, individuals engaging in inter-group conflict should have different preferences for the welfare of in-group vs. out-group members. This is in line with the theory of parochial altruism (Bowles, 2009; Choi and Bowles, 2007; García and van den Bergh, 2011; for a review, see Rusch, 2014), suggesting that evolution may have favored a joint development of positive social preferences toward in-group members and negative social preferences toward out-group members. Not surprisingly, there is increasing theoretical and experimental research in economics and related areas which examines the assumed relationship between individuals' social preferences and their conflict engagement (for an overview, see Section 1.1). Yet, little is known about the individual heterogeneity in social preferences toward in-group vs. out-group members. Only recently has economic research revealed the existence of different types of social preferences in inter-group conflict: Some subjects are "groupy", i.e., they show different preferences for in-group and out-group members, while others are "non-groupy" (Kranton et al., 2016; Kranton and Sanders, 2017). Identifying *who* actually engages in inter-group conflict – and if they do so *why* – by means of social preferences is useful for predicting and potentially preventing individual conflict behaviors.

Therefore, our main contribution to this research field is threefold. First, we are among the first researchers to empirically identify different types of individual social preferences for conflict engagement. Combining the concepts "groupy" social preferences and parochial altruism, we distinguish between social preferences toward the in-group and toward the out-group, classifying six distinct preference profiles. From a social preference model, we derive three distinct "non-groupy" types who do not differentiate between in-group and out-group members in their preferences: (i.) *Universal Altruists*, (ii.) *Universal Egoists*, and (iii.) *Universal Competitors*, who are altruistic, egoistic, or spiteful, respectively, irrespective of others' group membership. In contrast, there are three "groupy"-types who have group-dependent preferences. These types show a greater concern for in-group compared to out-group members. (iv.) *Weakly Parochial Altruists* are prosocial toward in-group members and less so toward out-group members, but they do not have negative social preferences (i.e., competitiveness, aggression) toward the latter. (v.) *Strongly Parochial Altruists* are prosocial toward in-group members coupled with negative social preferences toward out-group members. Lastly, (vi.) *Parochial Egoists* are egoistic toward in-group members but are willing to forego some of their own gain to reduce the payoff of out-group members, i.e., they display out-group spitefulness. Identifying the prevalence of these preference profiles helps to better understand individual heterogeneity in conflict participation.

This is linked to our second main contribution: We provide a novel methodology to assess different types of social preferences related to inter-group conflict participation. Our preference measure is a short and simple adaption of the well-known and highly reliable Social Value Orientation Slider measure (Murphy et al., 2011), which allows us to assess in- and out-group-dependent social preferences separately. This measure allows a continuous assessment of self- and other-regarding distributional social preferences in a non-strategic setting.

Our third main contribution relates to the empirical identification of the proposed social preference types in a unique and heated inter-group conflict setting: the Austrian presidential election of 2016. The intense conflict between the opposing candidates allows us to identify even extreme preferences, ranging from altruism to competitiveness, and potential differences regarding these preferences toward in-group members (i.e., those individuals who support the same candidate) and out-group members (i.e., those individuals who support the opposing candidate). Using a panel design, we conduct an experimental field study with a representative sample of Austrian voters. The overall three measurement points (shortly before, shortly after, and three months after the election) allow us to also determine the stability of social preferences over the course of conflict.

In the heated real-world conflict setting that we investigate, we find on average substantial inter-group discrimination in social preferences. As expected, we find considerable heterogeneity in individuals' social preferences. That is, about 50% of participants have group-dependent social preferences, i.e., they are less prosocial toward out-group than toward in-group members. However, we show that the proposed relationship between positive preferences toward in-group members and associated negative preferences toward out-group members (i.e., strong parochial altruism) proves true only for a minority of individuals. Hence, group-dependent social preferences are more diverse than suggested in previous research. Out-group spitefulness is associated with higher age and group identity as well as lower education and in-group prosociality.

1.1. Related Literature

Our study contributes to the growing literature on the relationship between social preferences and participation in inter-group conflict. Previous experimental research provides mixed results regarding individuals' general level of prosociality and their willingness to engage in inter-group conflict. Some studies find a positive relationship (Abbink et al., 2012; Aaldering et al., 2013). For instance, participants who cooperated in a prisoner's dilemma game were more likely to benefit their in-group members at personal cost and at the expense of out-group members' payoff in a subsequent inter-group social dilemma (Abbink et al., 2012). In contrast, other studies show either no relationship (Corr et al., 2015) or even indicate that a higher level of prosociality decreases individuals' willingness to engage in personally costly inter-group conflict (Thielmann and Böhm, 2016; de Dreu, 2010)

Despite various operationalizations of social preferences, none of these studies have considered differential preference profiles toward in-group and out-group members as suggested by the theory of parochial altruism (Choi and Bowles, 2007). However, there is also a growing literature on the relationship between group identity and social preferences. This connection was first explicitly formulated in economics by Akerlof and Kranton (2000), who drew on research from related fields (especially on social identity theory, Tajfel and Turner, 1979). Their argument that

group identity affects economic outcomes led to various experimental studies measuring the influence of group identity on behavior, the latter captured in the form of social preferences. For laboratory studies, this was done most notably by Chen and Li (2009). They observed that subjects are willing to forego more of their own payoff for the benefit of an in-group member as compared to an out-group member. These results have been replicated in different variations in the lab (e.g. Ockenfels and Werner, 2014; Kranton et al., 2016). Studies on group identity in the lab are complemented by studies focusing on the relationship between social preferences and group identity in natural groups in the field, focusing on different types of groups ranging from, e.g., neighborhoods (Falk and Zehnder, 2013), army battalions (Goette et al., 2012), and ethnic groups (Schubert and Lambsdorff, 2014). Taken together, research both in the lab and the field using various forms of economic games consistently find evidence for group-dependent social preferences, i.e., that people on average are more willing to benefit in-group members than out-group members at personal cost (for a meta-analytical review, see Balliet et al., 2014).

Yet, previous research is silent about inter-individual heterogeneity in group-dependent social preferences. There are two notable exceptions. Kranton et al. (2016) show that group-dependent social preferences are only present for a certain share of individuals ("groupy" subjects), while others show equal levels of prosocial behavior toward in-group and out-group members ("non-groupy" subjects). Kranton and Sanders (2017) then show that group-dependent preferences are predicted by political party affiliation and hypothesize that group dependency of social preferences is contingent on political contestation. They call for future research to develop an independent measure that may predict group-dependent preferences and behaviors, as we are doing with the present research.

Moreover, none of these studies have considered the dynamics of group-dependent social preferences over the course of conflict. That is, how does the prevalence of different types of social preferences toward in-group and out-group members change during versus after the specific inter-group conflict (if they change at all)? Evidence from several field studies suggests that group-dependent social preferences may prevail and even increase after extreme forms of inter-group conflict, i.e., war violence (Bauer et al., 2016). However, there is a lack of experimental (field) research on the dynamics of social preferences, particularly in conflicts not involving violent encounters (e.g., organizational or political conflicts).

We directly build on and extend previous research by assessing social preferences toward in-group and out-group members during and after a salient nationwide political conflict. We look at inter-individual heterogeneity in group-dependent social preferences, the determinants and stability of these preference types, as well as their potential to predict conflict participation (e.g., voting behavior). Before describing our study design in more detail, we will introduce our theoretical framework of social preferences aimed to shed light on inter-individual heterogeneity in inter-group conflict.

1.2. Modeling Group-Dependent Social Preferences

Social preferences can be defined as preferences containing arguments that go beyond the own material self-interest of the actor, i.e., beyond pure egoism. There are different subclasses, focusing, for example, on the material well-being of others, or others' behaviors and intentions (Kerschbamer, 2015). Concern for the material well-being of others may take different forms, including

altruism, equality and social welfare concerns, and spitefulness. A prominent conceptualization to describe individuals' social preferences with regard to their concern for the welfare of others is the framework of Social Value Orientation (Murphy and Ackermann, 2014, SVO), originally developed in social psychology (Messick and McClintock, 1968) and subsequently used in economics to identify different types and intensities of distributional preferences (see Kerschbamer, 2015, for a short overview).

There exist several measures for individuals' social preferences as captured by their Social Value Orientation (Murphy and Ackermann, 2014). The SVO Slider measure (Murphy et al., 2011) is based on a multiple within-subject measurement approach using dictator game distributions with different marginal rates of substitution (see Figure C.1 for the six distribution decisions). The participant's allocations result in an SVO angle $\in [-16.26^o, 61.39^o]$ indicating his or her concern for another persons welfare.[1] This angle can be transformed (by taking its tangent) to the parameter $\alpha \in [-0.29, 1.83]$ of a simple other-regarding social preference function $U(\pi_s, \pi_o) = \pi_s + \alpha * \pi_o$, where π_s is the payoff for the allocator and π_o is the payoff for the recipient. Thus, the SVO Slider measure captures (i.) altruism (in the case that $SVO^o > 22.45$), where the allocator gains utility from the recipient's payoff, and (ii.) spitefulness (in the case that $SVO^o < 0$), where the payoff of the recipient results in disutility for the allocator (this conforms to the definition of pure altruistic and spiteful preferences, e.g., Levine, 1998; Fehr and Fischbacher, 2002). Lastly, (iii.) an individual may also be classified as egoistic (in the case that $0 < SVO^o < 22.45$), indicating neither a positive nor a negative social preference toward the recipient. As such, the SVO Slider measure with its resulting utility function parameters (i.e., SVO angles) provides a continuous measure of individuals' prosocial preferences, covering the full spectrum from spiteful over egoistic to altruistic preferences. Social preferences based on the SVO framework have been shown to be predictive to behavior in various games (e.g., Yamagishi et al., 2013; Balliet et al., 2014).

Importantly, in the standard SVO Slider measure, the recipient of the allocator's decision is an unknown other. To assess group-dependent social preferences toward in-group and out-group members, respectively, we adopt the measure by varying the recipient's group membership. Combining the distinct utility function parameters for in-group and out-group recipients, we are able to precisely distinguish between universal (i.e., "non-groupy") and parochial (i.e., "groupy") social preferences, including their specific sub-types. The adopted SVO model includes social preferences toward in-group members and out-group members separately (IN_SVO and OUT_SVO respectively), resulting in the following types of group-dependent social preferences :

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[1]The angle is computed as the inverse tangent of the ratio between the mean allocations to the other $\bar{A}_O$ and oneself $\bar{A}_S$: $SVO^o = arctan((\bar{A}_O - 50)/(\bar{A}_S - 50))$. 50 is subtracted from both mean allocations to shift the base of the angle toward the center of the circle in the self/other allocation plane, which forms the basis of the distribution decisions (see Figure C.2). For more information, see Murphy et al. (2011).

$$\text{Type} = \begin{cases} \text{I: Universal Altruist,} & \text{if IN\_SVO} \geq 22.45 \text{ and OUT\_SVO} \geq 22.45 \\ \text{II: Universal Egoist,} & \text{if IN\_SVO} \in [0, 22.45[\text{ and OUT\_SVO} \in [0, 22.45[\\ \text{III: Universal Competitor,} & \text{if IN\_SVO} < 0 \text{ and OUT\_SVO} < 0 \\ \text{IV: Weakly Parochial Altruist,} & \text{if IN\_SVO} \geq 22.45 \text{ and OUT\_SVO} \in [0, 22.45[\\ \text{V: Strongly Parochial Altruist,} & \text{if IN\_SVO} \geq 22.45 \text{ and OUT\_SVO} < 0 \\ \text{VI: Parochial Egoist,} & \text{if IN\_SVO} \in [0, 22.45[\text{ and OUT\_SVO} < 0 \end{cases}$$

Figure 1: Group-Dependent Social Preference Types
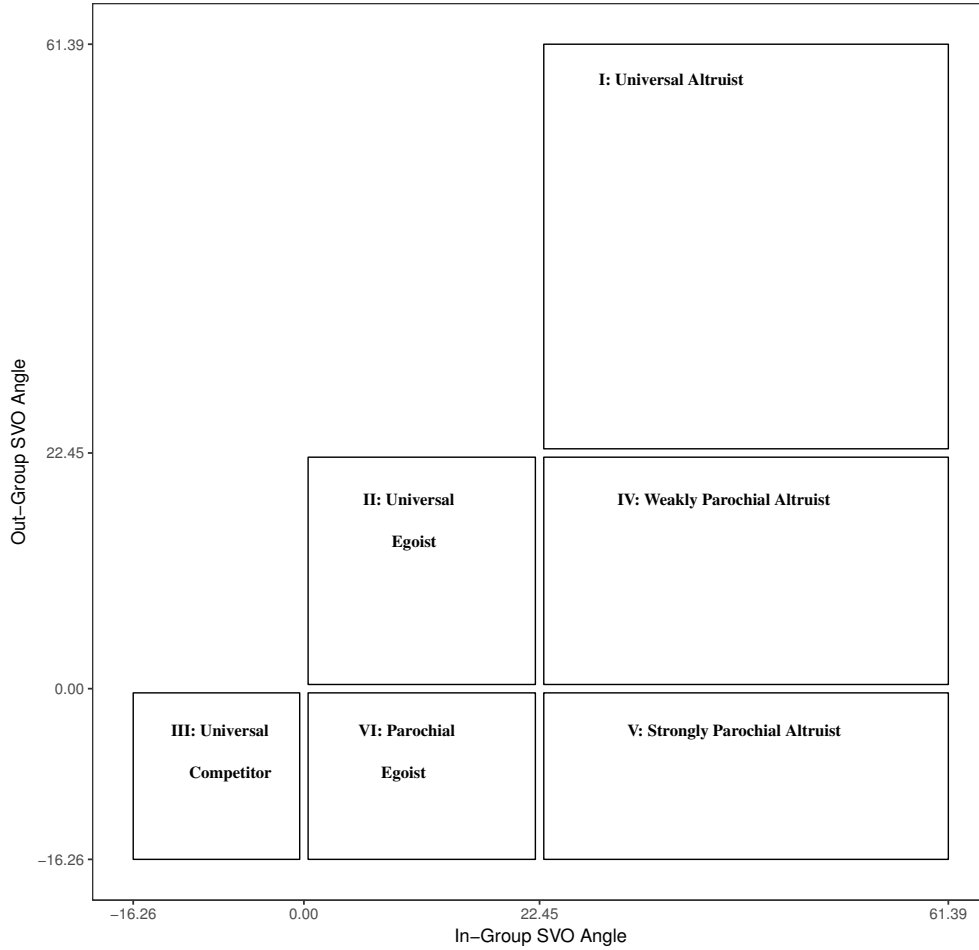
The figure displays the resulting types based on in-group and out-group-dependent social preferences.

Figure 1 displays the resulting preference types with the corresponding areas of utility parameters. We term the first three types following the diagonal (I, II, and III) *Universal*, as their utility function parameters do not (strongly) vary between in-group and out-group members, in the sense that they remain largely altruistic, egoistic, or competitive regardless of the group membership of

their interaction partner, i.e., they have group-independent social preferences. For example, while *Universal Altruists* may not have exactly the same utility function parameter for in-group and out-group members, both parameters fall in the range that is traditionally classified as prosocial or altruistic in the literature (Murphy et al., 2011; Murphy and Ackermann, 2014). That is, they care (positively) about the payoff of both in-group and out-group members.

The other three types below the diagonal (IV, V, and VI) we term *Parochial*, as they differentiate between in-group and out-group members in the sense that they have substantially lower SVO angles when interacting with an out-group member as compared to an in-group member, i.e., they have group-dependent social preferences. Note that the distinction between *Weakly Parochial Altruists* and *Strongly Parochial Altruists* has been introduced in previous research (Böhm, 2016), although it has never been tested empirically. Additionally, we introduce the type of *Parochial Egoist* based on our group-dependent social preference model. Up until now, egoism was (at least implicitly) assumed to be universal. In contrast, parochial egoism is defined as having egoistic concerns in interactions with in-group members but having spiteful concerns in interactions with out-group members.

In the remainder of the paper, we will describe the field setting in which the data were gathered (section 2). Afterwards, we will present the results of our experimental field study (section 3), before discussing the findings and concluding (section 4).

2. Method

2.1. The Conflict Setting

In 2016 and 2017, a series of elections worldwide divided various countries' populations into opposing camps. Examples include the presidential race in the US, the Brexit referendum in the UK, and the run-off French presidential election. The Austrian presidential election in 2016 – the conflict situation studied in the article at hand – followed a similar pattern: In the final round of the election, two candidates – one associated with the left-wing Green Party and one from the Freedom Party – were up for election, the latter being considered far right, in a setting and an atmosphere similar to those of the US presidential election in 2016.

The Austrian president is directly elected by Austrian citizens over the age of sixteen every six years. If no candidate receives an absolute majority in the first vote, a run-off election with the two leading candidates takes place. Left-wing Alexander Van der Bellen won the first run-off by a narrow margin of 0.6 percentage points (around 31,000 votes). However, the party of the defeated candidate, Norbert Hofer, challenged the outcome. Although the Austrian Constitutional Court found no evidence of manipulation, violations of formal requirements led to the nullification of the election. In the repeated election on December 4, 2016, Van der Bellen again won with 53.8% of the votes. Our study took place around this repeated run-off election, where polls were unable to predict a winning candidate.[2]

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[2]For example, a newspaper article published on the morning of the election day stated that "polls published in the last weeks do not see a clear favorite; in all surveys the distance between the two candidates was within the statistical error margins" (`http://diepresse.com/home/innenpolitik/bpwahl/5128129/Vierter-Anlauf_ Wer-zieht-in-die-verwaiste-Hofburg-ein`, our own translation from the German, accessed on 18.07.2017).

2.2. Participants and Procedure

We conducted an incentivized field experiment with a quota-representative sample of the Austrian electorate (i.e., Austrian citizens over the age of sixteen; data on quota representativeness of gender, age, and education are presented in Table A.1). We used a panel design, multiply surveying the same participants at what we refer to as three stages of the conflict. At *stage 1*, we collected data in the week before election day, when the conflict was heated and the outcome uncertain. At *stage 2*, participants were surveyed again in the week after election day, when the winner and the loser had been determined and it was clear that the outcome would not be contested in court. Finally, at *stage 3*, we surveyed participants again three months after election day. Data were collected by the survey company Norstat using an ISO 26362 certified online panel.[3] Figure 4 displays both the structure of the panel design and of the surveys administered at each stage of the conflict.

From 777 participants who completed the study at stage 1, 660 completed the study at stage 2, and 482 participants also completed the study at stage 3. We exclude 2 observations with the same ID, indicating that one participant had been able to complete the survey twice due to a technical error. Our sample therefore contains 480 participants for stage 3, i.e., resulting in a panel mortality of 38.2% after three months. We had to exclude 39 further participants who inconsistently reported their voting decision at the second and third stages. All of our analyses – regardless of the stages they refer to – are based on those 441 participants who completed the survey at all three stages and showed no inconsistency in reporting their voting decision. The analysis sample includes 207 women (47%), and participants are between 16 and 94 years old (mean = 50.1, sd = 15.0). 65 participants state that they did not vote for either of the two candidates (14.7%). 188 participants each state that they voted for either Hofer or Van der Bellen (42.6%, respectively). Analyses employing in-group and out-group-dependent social preferences and the in-group identity measure described below are based on those 376 participants who state that they voted for either of the two candidates and could therefore be assigned to an in-group with the corresponding out-group.

Using a random-lottery incentive scheme, one in five participants was selected for payment (conversion rate: 100 points = 3 Euro) for one decision each of the SVO Slider measure with an anonymous interaction partner (only at stage 1, which we do not report in this paper) and for one decision each of the SVO Slider measure with an in-group and out-group member (at stage 1-3). Therefore, participants had four opportunities to be chosen for payoff, given that they participated in all three stages. To qualify for payment at stages 1 and 2, participants had to participate in the survey both at stage 1 and at stage 2 and were informed of this requirement at the beginning of the first survey. If a participant was (at least once) selected, he or she was paid as either allocator or recipient in the respective SVO Slider measure. An allocator was paid according to the points he or she had allocated to him- or herself in one randomly selected decision. For a recipient, one decision of a randomly chosen allocator was selected, determining the corresponding recipient's payoff. On average, participants who completed both stage 1 and stage 2 and were selected for payment received 2.46 Euro (min = 0.45 Euro, max = 5.55 Euro; 0.89 Euro expected payoff for all participants) for stage 1 and 2.26 Euro (min = 0.45 Euro, max = 3.00 Euro; 0.45 Euro expected

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[3]Further information on the panel quality, including offline recruitment measures, is available online under `http://www.norstat.co.uk/methods/online-data-collection/` (accessed on September 2nd 2017).

payoff for all participants) for stage 2. For stage 3, participants selected for payment received on average 2.17 Euro (min = 0.45 Euro, max = 3.00 Euro; 0.43 Euro expected payoff for all participants completing stage 3). Payment information was sent to Norstat, who then, to ensure anonymity, paid the selected participants. In addition, participants received a fixed remuneration from Norstat of 1.00, 0.70, and 0.50 Euro for completing stages 1, 2, and 3, respectively.

Figure 2: Experimental Design
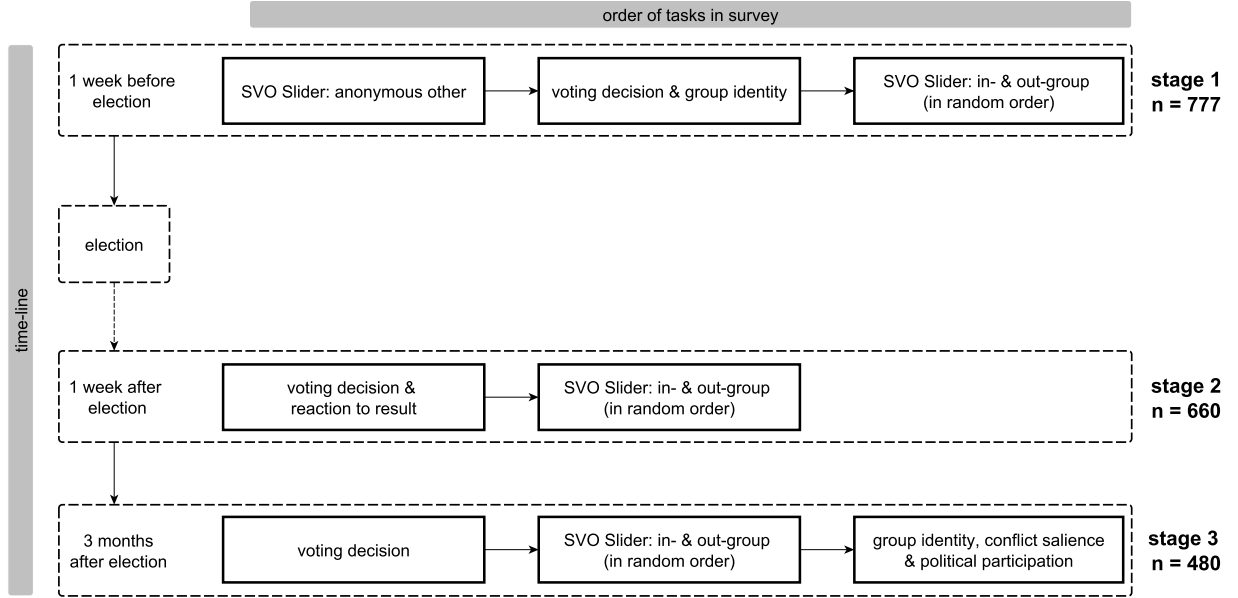
The figure displays the experimental design with all three stages of the conflict and the corresponding time-line on the y-axis. The experimental structure within each stage and the order of the tasks and additional survey measures are displayed on the x-axis. The sample size for each stage after exclusion of incomplete questionnaires is displayed on the right-hand side.

2.3. Measures

Our main dependent variable is the resulting *SVO angle* of the SVO Slider measure (introduced in section 1.2), capturing participants' social preferences on a spiteful - egoistic - altruistic continuum using the parameter α of the simple other-regarding utility function $U(\pi_s, \pi_o) = \pi_s + \alpha * \pi_o$. Importantly, we measured social preferences independently for in-group and out-group members at all three stages, as displayed in Figure 4. That is, participants completed the SVO Slider measure both with an in-group and an out-group member recipient at all three stages of the conflict, such that we are able to identify the dynamics of group-dependent social preferences during the course of the conflict. Figure 3 shows an example SVO Slider measure item (i.e., when matched with a voter of Hofer).

We assessed a number of additional measures. *In-group identity* was measured at stages 1 and 3 with an adapted German version of the four items devised by Doosje et al. (1995), covering cognitive, evaluative, and affective aspects of group identification. Participants had to rate the

Figure 3: Sample Decision Screen

The figure displays one of the SVO Slider measure decision tasks when an allocator is matched with a Hofer voter as a recipient. Text in red (gray in grayscale printouts) shows translations of the original German instructions.

applicability of these statements (I identify with other members of [name of in-group], I see myself as a [name of in-group], I am glad to be a member of [name of in-group], I feel strong ties with the [name of in-group]) on 9-point scales. Cronbach's alpha for the scale at stage 1 is 0.91 and 0.93 for Van der Bellen and Hofer voters, respectively (Cronbach's alpha of 0.89 and .90 at stage 3).

Additionally, we assessed how satisfied, surprised, disappointed, and happy participants were with the election outcome and whether they had expected this result at stage 2. We used 5-point scales, with higher values indicating greater *dissatisfaction with the election* outcome. A Cronbach's alpha of 0.86 indicates that the questions measure a general positive/negative reaction to the election outcome.

The *salience of the conflict* was measured at stage 3 by asking participants to rate if the relationship between voters of Hofer and van der Bellen was (i.) hostile, (ii.) friendly, (iii.) tense and (iv.) peaceful compared to December before the election on 5-point scales ranging from "a lot less" to "a lot more". The resulting scale of all four ratings, with higher values indicating more conflict salience, has a Cronbach's alpha of 0.88. Finally, the participant's *political participation* was measured at stage 3, i.e., whether a person reads the political section of a newspaper, how often a person engages in political discussions, amount of time spent actively supporting a candidate in the elections (Barnes and Kaase, 2014). Cronbach's alpha for the scale is 0.83, with higher values indicating greater political participation.

In addition to these measures, we also included a number of socio-demographic variables, such as age, education, gender, and hometown population. We also included some additional questions, e.g., on voting behavior (such as voting decision in the first round of the presidential election or whether a participant has cast an absentee vote), candidate preference, and voting motives, which we do not report in the present paper.

3. Results

Aggregate results for participants' social preference parameters when matched with an in-group and out-group member, respectively, are presented in Table 1. For participants matched with an in-group interaction partner, we find a mean SVO angle of 24.26 degrees at stage 1. If we transform the individual SVO angle to the parameter α of the above introduced utility function, we get an average weight α of 0.49. Hence, participants are on average willing to give up 0.49

monetary units (MUs) to increase the payoff of an in-group member by 1 MU. Participants are significantly less concerned about the welfare of out-group members than they are about that of in-group members (two-sided paired-sample t-test, $p < 0.001$): When matched with an out-group member, participants are on average willing to reduce their own payoff by only 0.18 MUs in order for the other to gain 1 MU. These results indicate in-group favoritism, as found in previous experiments (e.g., Thielmann and Böhm, 2016; Chen and Li, 2009). However, it is notable that we find a particularly large effect with a Cohen's d of 0.80, while meta-analyses on in-group favoritism (Balliet et al., 2014; Lane, 2016) have shown predominantly small to medium effect sizes of around 0.30, with effects for social and geographical groups usually being larger with an average of 0.55 (Lane, 2016). This speaks for the strong salience of conflict in our experimental field setting.

Table 1: Descriptive Statistics

The other is an...		Stage 1		Stage 2		Stage 3	
		Mean	sd	Mean	sd	Mean	sd
In-group member	SVO	24.26	15.59	24.20	15.43	24.36	15.19
	α	0.49	0.35	0.49	0.35	0.49	0.35
	Share with $\alpha < 0$	0.06	-	0.06	-	0.05	-
Out-group member	SVO	8.48	20.66	8.41	20.16	8.46	19.80
	α	0.18	0.41	0.18	0.40	0.18	0.40
	Share with $\alpha < 0$	0.35	-	0.36	-	0.35	-

The table displays descriptive statistics on both SVO angles and α-parameters of the SVO utility function for all three stages of conflict when matched with an in-group and an out-group member, respectively. Also, the share of participants with spiteful preferences (with $alpha < 0$) is presented. For stage 1, n = 349 and for stages 2 and 3, n = 376. The increase in the number of observations from stage 1 to stages 2 and 3 results from participants who were undecided about voting for either of the two candidates and therefore could not be assigned to a group at stage 1 but stated that they voted for a candidate at stages 2 and 3.

We observe spitefulness for only 6% of participants when matched with an in-group member. This is different when participants are matched with an out-group member. Here, a significantly larger share of 35% show spiteful preferences (SVO angle < 0), indicating that they are willing to forego some of the own gain to reduce the payoff of the out-group member (two-sided two-sample proportions test, $p < 0.001$).

3.1. Mapping Preference Types in Inter-Group Conflict

Next, we investigate the relationship between in-group and out-group-dependent social preferences by regressing out-group social preferences on in-group social preferences. For the pooled data of all three conflict stages, we observe a significant regression coefficient for in-group social preferences of 0.509 ($p < 0.001$). Hence, prosocial preferences toward out-group members increase with prosociality toward in-group members (see also Thielmann and Böhm, 2016). The included dummy variables for stages and their interactions with in-group SVO angles do not yield significant results, indicating that the effect is stable over time (for the full model, see Table A.2 in the Appendix). However, as the regression coefficient is smaller than 1 (95% CI [0.384, 0.635]),

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this leads to an increase in the difference between in-group and out-group SVO angles when in-group prosociality increases. This could be construed as evidence of a weak form of parochial altruism, indicating concern for both in-group and out-group members but with a greater concern for the welfare of in-group members than for that of out-group members.

However, looking at the individual-level data, we find this aggregate effect to be generated by different types of individuals, with distinct patterns of in-group and out-group social preferences, as introduced in section 1.2. The distribution of preference types for all three stages of the conflict is displayed in Figure 4, with the Roman-numbered areas corresponding to the different types. Corresponding shares can be found in Table 2. For stage 1, we observe that more than 60% of voters are classified as altruistic toward in-group members. Half of those are also altruistic toward out-group members, and their altruism therefore is not group-dependent. The other half of in-group altruists, however, is less prosocial toward out-group members than toward in-group members. 20% of voters are strongly parochial altruists with an SVO angle < 0 toward out-group members, indicating that they are willing to forego some of their own gain to reduce the out-group member's payoff. 13% of voters are weakly parochial altruists and therefore egoistic when matched with an out-group member. In addition, 10% have egoistic preferences when matched with both an in-group and an out-group member and are therefore classified as universal egoists. Moreover, universal competitors account for 7% of voters at stage 1. Finally, we find that parochial egoists make up a share of 17% of voters. Such individuals are egoistic toward in-group members and in this case only care about their own payoff. At the same time, however, they are willing to forego their own payoff in order to decrease the payoff of out-group members.

Table 2: Distribution of Group-Dependent Social Preference Types

	Type	Stage 1	Stage 2	Stage 3
I	Universal Altruists	30.7	30.6	29.3
II	Universal Egoist	10.3	13.8	16.8
III	Universal Competitor	7.2	6.4	5.3
IV	Weakly Parochial Altruist	12.6	11.7	10.6
V	Strongly Parochial Altruist	20.1	20.0	20.2
VI	Parochial Egoist	16.6	15.7	14.9
	Other	2.6	1.9	2.9
	N	349	376	376

The table displays the shares of each group-dependent social preference type in each of the three stages. The increase in the number of observations from stage 1 to stage 2 results from subjects who were undecided about voting for one of the candidates and therefore unclassifiable as a type at stage 1.

3.1.1. Dynamics of Group-Dependent Social Preference Types over the Course of Conflict

Regarding the stability of the frequencies of the different group-dependent preference types, we find neither significant changes from stage 1 to stage 2, nor from stage 2 to stage 3 (Chi2 goodness of fit tests, $p = 0.423$ and $p = 0.420$, respectively). However, from stage 1 to stage 3, we find significant differences in the shares of the types (Chi2 goodness of fit test, $p = 0.004$). Tests of proportions comparing each type's share from stage 1 to stage 3 show that this effect is

Figure 4: Types of Group-Dependent Social Preferences
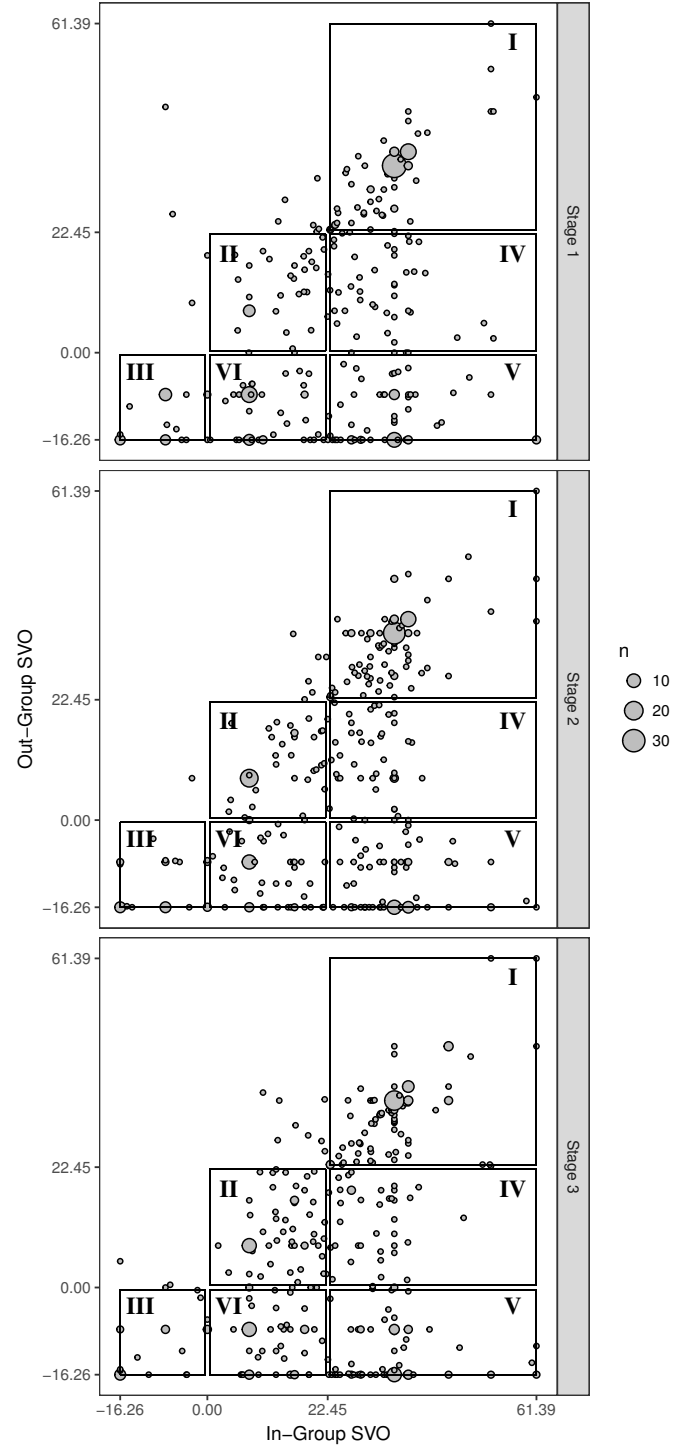
The figure displays scatterplots depicting the relationship between in-group and out-group-dependent social preferences. Marker size indicates the number of overlapping observations. The numbered areas in the graphs depict the different group-dependent social preference types introduced in section 1.2.

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driven by a significant increase in universal egoists from 10% to almost 17% ($p = 0.012$). While the increase in universal egoists remains significant at the 10%-level after applying a Bonferroni correction for multiple testing with 7 comparisons, all other shares show no significant change even before Bonferroni correction (all $ps > 0.100$).

Table 3: Logit Regression on Being Type "Universal Egoist" at Stage 3

	(1) Event: Is Universal Egoist at Stage 3
Universal Altruist	-1.030* (0.458)
Universal Egoist	0.905* (0.462)
Universal Competitor	-1.201 (0.802)
Weakly Parochial Altruist	-0.604 (0.541)
Strongly Parochial Altruist	-1.125* (0.531)
Unclassified	1.019 (0.741)
N	349
Adjusted McFadden's R^2	0.039
LR Chi2(6)	28.05

The table presents the unstandardized regression coefficients of a logit regression (standard errors in parentheses). The event to be predicted is being a universal egoist at stage 3; the independent variables refer to the type at stage 1. Constant omitted. Parochial egoists are the base category for the dummy coding. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Using a logit regression presented in Table 3, we test whether participants classified as certain types at stage 1 are more or less likely to become universal egoists. In other words, we analyze type-specific stability of group-dependent social preferences over the course of the conflict. We find significant effects for three of the stage 1 types (all $ps < 0.05$). Unsurprisingly, voters who were universal egoists at stage 1 have a higher probability of still being universal egoists at stage 3. More interestingly, though, we find that both universal altruists and strongly parochial altruists are significantly less likely to change their type to universal egoists compared to all other types. This indicates that individuals with rather weakly pronounced group-dependent social preferences, i.e., weakly parochial altruists, are comparatively more likely to become universal egoists three months after the conflict's outcomes have been determined. In other words, group-dependent preferences may be at least partly adaptive to the salience of the conflict situation.

3.1.2. Determinants of Out-Group Spitefulness

To conclude our analysis of the determinants of participation in group conflict, we estimate a panel logit model of the pooled data for all three stages of the conflict with out-group spitefulness as dependent variable (1 = out-group spiteful), see Table 4. As predictors we add in-group SVO and conflict stage dummies for the stages 2 and 3. We also add a dummy variable taking the value of 1 (0) if a participant voted for Hofer (Van der Bellen). We add interaction terms of the voting and stage dummies to test whether spitefulness toward the out-group changes differently for the winners and losers of the conflict over time. As socio-demographic variables we add gender, age,

education, and hometown population. Finally, we include our psychological measures, namely political participation, perceived conflict salience, in-group identity, and the reaction to the result.

We find that with an increase in in-group SVO ($p < 0.001$), the probability of being spiteful toward an out-group member decreases. From the socio-demographic predictors, we find that a lower education (both $ps < 0.05$) and a higher age ($p < 0.001$) increase the probability of out-group spitefulness. The same holds true for stronger group identity ($p < 0.001$) and stronger conflict salience ($p < 0.01$).

3.2. Predicting Voting Behavior

Finally, we look into the question of whether group-dependent social preferences are predictive of participants' voting decisions using logit regressions (Table 5). Model 3 contains participants' social preferences both when matched with another person who supports Hofer and Van der Bellen. Both are significant predictors of voting behavior (both $ps < 0.001$). Hence, stronger positive (negative) social preferences toward others who support a certain candidate are associated with an increased likelihood of voting for this candidate (the opposing candidate). Importantly, an adjusted McFaddens R2 of 0.37 indicates excellent model fit (McFadden, 1979), especially considering that we do not measure individuals' preferences for the candidates but only for the voters of the own candidate or the opposing candidate. Model 4 includes gender, age, education, and population of the hometown as additional socio-demographic predictors, none of which yield a significant effect. In fact, the inclusion of those variables decreases the adjusted McFadden's R2. This strengthens the result that group-dependent social preferences have a high predictive validity for self-reported conflict participation in the context of voting behavior.

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Table 4: Logit Regression on Out-Group Spitefulness

	(2) Event = Out-Group Spiteful
Stage = 2	0.132 (0.335)
Stage = 3	-0.251 (0.334)
Voted Hofer = 1	-0.985 (0.722)
Voted Hofer*Stage = 2	-0.420 (0.465)
Voted Hofer*Stage = 3	-0.209 (0.464)
In-group SVO	-0.054*** (0.008)
Age	0.063*** (0.013)
Gender = Male	0.472 (0.359)
Education:	
Apprenticeship	1.536* (0.647)
Medium-level technical or vocational school	1.619* (0.703)
University-track secondary school (Matura)	0.658 (0.728)
University	0.351 (0.764)
Hometown population:	
5,000 to 9,999	-0.017 (0.563)
10,000 to 49,999	0.026 (0.539)
50,000 to 99,999	-0.211 (0.800)
100,000 and more	0.116 (0.411)
Political participation (higher = more)	0.254 (0.291)
In-group identity (higher = stronger)	0.458*** (0.117)
Reaction to election outcome (higher = more negative)	0.378 (0.269)
Conflict salience (higher = more salient)	0.636** (0.223)
N	1020
Adjusted McFaddens R^2	0.075
LR Chi2(20)	108.85

The table presents the unstandardized regression coefficients of a panel logit regression (standard errors in parentheses). Constant omitted. The event to be predicted is being out-group spiteful. For the education (hometown population) dummy variables, compulsory education (less than 5,000) serves as base category. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 5: Logit Regression on Voting Decision

	(3)	(4)
	Event = Vote for Hofer	
SVO Hofer	0.119*** (0.016)	0.120*** (0.017)
SVO Van der Bellen	-0.125*** (0.016)	-0.128*** (0.017)
Gender (1=male)		0.193 (0.294)
Age		-0.010 (0.010)
Education:		
Apprenticeship		-0.124 (0.499)
Medium-level technical or vocational school		-0.406 (0.576)
University-track secondary school (Matura)		-0.889 (0.550)
University		-0.690 (0.568)
Hometown population:		
5,000 to 9,999		0.519 (0.475)
10,000 to 49,999		0.692 (0.471)
50,000 to 99,999		0.164 (0.696)
100,000 and more		-0.027 (0.345)
N	376	376
Adjusted McFaddens R^2	0.374	0.353
LR Chi2(2) /LR Chi2(12)	200.84	213.85

The table displays the unstandardized coefficients of logit regressions (standard errors in parentheses). The event to be predicted is voting for Norbert Hofer. Constants omitted. For the education (hometown population) dummy variables, compulsory education (less than 5,000) serves as base category. In-group and out-group SVO angles are from stage 2, where participants reported their voting decision. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

4. Discussion

Understanding individual motivations to participate in group conflict is an essential step towards the mitigation of conflict. We contribute to answering this question by formalizing different in-group and out-group preference types within a distributional social preference framework. This results in a clear definition of six distinct preference types. These types build on and extend both the recently introduced classification of subjects as "groupy" and "non-groupy" (Kranton et al., 2016; Kranton and Sanders, 2017) and different forms of parochial altruism (Böhm, 2016). We differentiate "groupiness" into three parochial types, depending on whether individuals are altruistic or egoistic toward in-group members and egoistic or spiteful towards out-group members. There are also three distinct "non-groupy" types, depending on whether they are altruistic, egoistic, or spiteful toward both in-group and out-group members.

Supporting the relevance of the proposed preference types, we are able to empirically identify

all types using a large and representative sample in a salient inter-group conflict situation, i.e., the heated political conflict of the 2016 Austrian presidential election. Our results clearly show that considering individual heterogeneity may provide a qualitatively different picture and interpretation than relying on aggregated data would do (see also Kranton and Sanders, 2017, Kranton et al., 2016). Moreover, we find high consistency of social preferences types over the course of the conflict, with slightly decreasing group-dependency of preferences three months after the conflict's outcome has been determined, i.e., when the election results were announced. The stability of such preferences, however, may differ between conflict situations. It is not surprising that group-dependency decreases after a national election, where voters of opposing candidates will have to interact with each other in the future. In contrast, after wars between countries, perceived conflict might be more stable, potentially leading to more stable or even increasing group-dependent social preferences (Bauer et al., 2016).

Note that the newly proposed type of parochial egoists, derived from our group-dependent social preference model, proved to be empirically relevant (share of 17% at stage 1), with even a larger share than universal egoists (10%). In previous research, it was at least implicitly always assumed that egoism is universal and only in-group altruists would consider engaging in inter-group conflict (Bowles, 2009; Choi and Bowles, 2007). Our results however suggest that not only the positive social preference toward in-group members but also merely a negative social preference toward out-group members may increase conflict participation. For example, in the present conflict situation, an individual may have voted for a certain candidate not because he or she wanted to support this candidate but rather because he or she wanted to avoid the other candidate winning. Future research may use the proposed preference framework and measurement approach to investigate whether individuals with different forms of group-dependent preferences differ in specific actions aimed at increasing and/or decreasing in-group vs. out-group members' welfare.

In light of the individual heterogeneity we show it is maybe less surprising that experiments testing the different assumptions of the parochial altruism theory are, on the whole, inconclusive, as aggregate results mask effects on the individual level. Furthermore, type composition can be expected to vary in different contexts (Lane, 2016) and at least partly, as also shown in our study, during different points of inter-group conflict. With the heated Austrian presidential election, we used a real-world setting, where group identity and conflict were especially salient. Therefore, it is an open question as to whether a similar extent of parochialism and its different types can be found in other contexts. We consider the measurement of the type distributions to be a promising avenue for future research, be it in minimal group paradigm experiments in the lab, in conflicts between natural groups where overt conflict is absent, or in violent conflicts.

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Appendix A. Additional Tables Referenced in the Manuscript

Table A.1: Representativeness of Samples of All Three Stages for the Electorate

		n = 777	n = 660	n = 441
	Electorate	Sample Stage 1	Sample Stage 2	Sample Stage 3
Gender %male	48.3	48.4 [.448, 520]	49.4 [.455, .533]	53.1 [.483, .578]
Education %matura	27.6	27.9 [.248, .312]	28.6 [.252, .323]	29.7 [.255, .342]
Age (mean)	49.9	47.0 [45.9, 48.2]	47.8 [46.6, 49.0]	50.1 [48.7, 51.5]

The table shows the share of male voters, of voters with a general university entrance qualification (Matura) and the mean age of voters in the Austrian electorate. 95% confidence intervalls in parentheses for the samples. Data on gender distribution in the electorate were available directly from the register of voters (`http://www.bmi.gv.at/cms/BMI_wahlen/bundespraes/bpw_2016/Wahlberechtigte.aspx`, accessed on July 11, 2016). Data on age and education were provided by Statistics Austria, based on the newest available data at the time (from October 31, 2015).

Table A.2: Regression of In-Group Social Preferences on Out-Group Social Preferences

	(B5)
	Out-group SVO
In-group SVO	0.509***
	(0.064)
Stage = 2	-0.046
	(0.887)
Stage = 3	-0.075
	(0.963)
Stage = 2*In-group SVO	0.064
	(0.081)
Stage = 3*In-group SVO	0.048
	(0.071)
N	1101
R^2	0.174
F	27.31

The table shows unstandardized coefficients of an OLS regression (standard errors clustered on subjects as the independent unit of observations in parentheses). For the binary-continuous interactions, the in-group SVO angle was mean-centered. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$
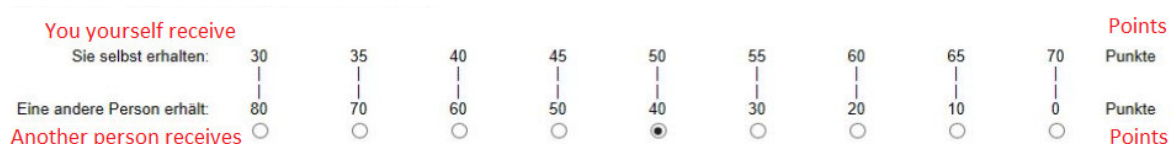
Part 2

In this section you can earn money be allocating sums of money (points) between yourself and two other participants in this survey who are chosen at random. These other persons do not know you, **these persons cannot influence your payment** and you will all **remain anonymous** to each other. All of your answers will be confidential.

As in last weeks survey, you can split up sums of money between yourself and **a person who voted for Norbert Hofer** and between yourself and **a person who voted for Alexander Van der Bellen**. The order in which you will be matched with these two other persons is random.

Example of a distribution decision (in this case, with an anonymous other person):

You yourself receive										Points
Sie selbst erhalten:	30	35	40	45	50	55	60	65	70	Punkte
Eine andere Person erhält:	80	70	60	50	40	30	20	10	0	Punkte
Another person receives	○	○	○	○	⦿	○	○	○	○	Points

In this case, you would have allocated 50 points to yourself and 40 points to the anonymous other person. So as you can see, your decisions affect the sum of money you will receive and the sum of money that the other person will receive.

Every fifth participant in the survey is chosen at random for payment of one of the decisions. If you are chosen to receive payment, one of two cases can occur:

- You and the other person (a Hofer voter/Van der Bellen voter) will be paid out the points that you allocated to yourself and to the other person.

- You are the "other person" and the points assigned to you by yet another participant (Hofer voter/Van der Bellen voter) will be paid out to you.

The corresponding payment will be paid out based on a conversion factor of 100 points = 3 Euros approximately two weeks after completion of the opinion people survey in addition to your fixed payment.

Please indicate for each of the following decisions which distribution of money you prefer the most. There are no 'right' or 'wrong' answers.

Please click OK to begin. If you use a smartphone, please make sure that the questions are displayed as in the example question shown above.

Appendix C. Additional Information on the SVO Slider Measure

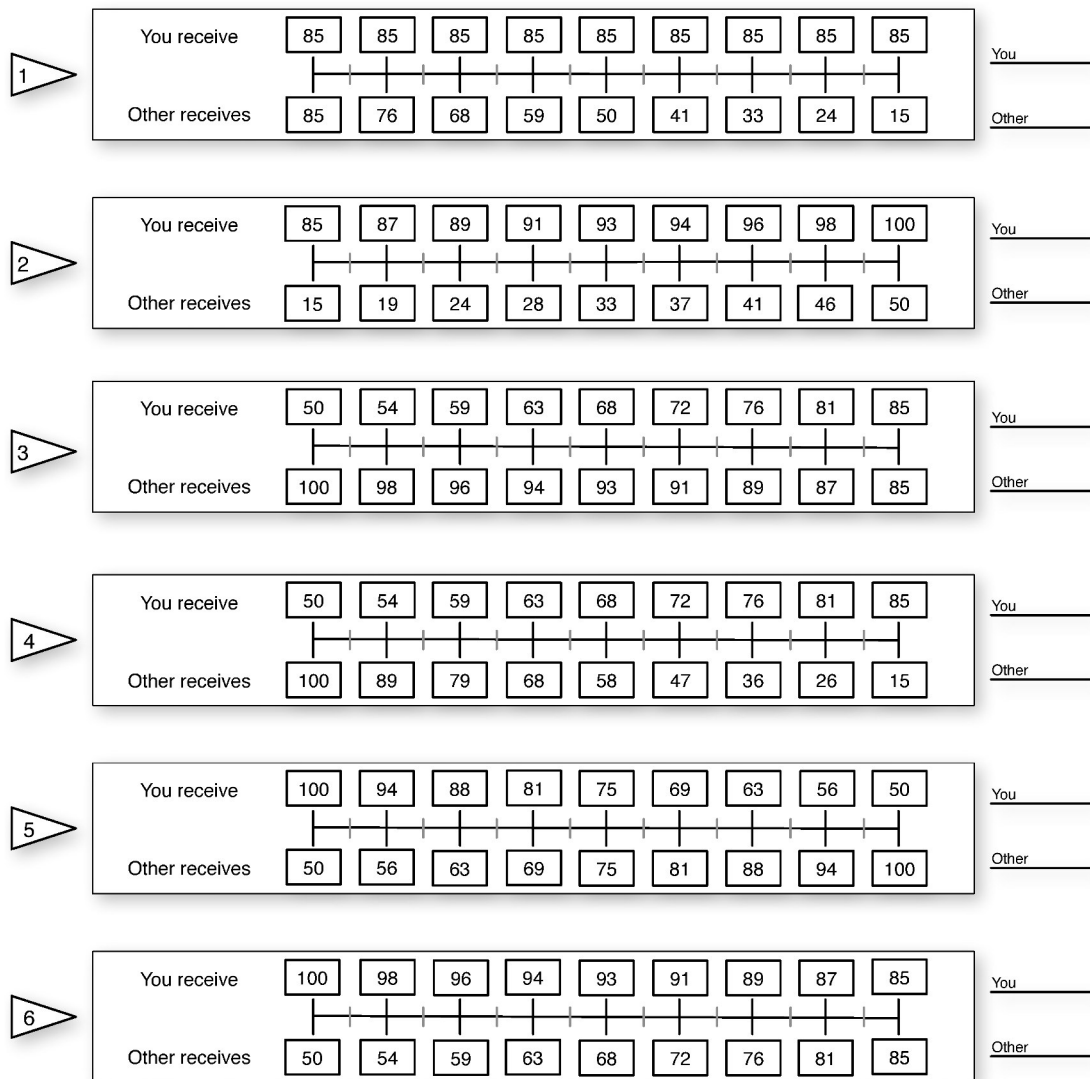Figure C.1: Distribution Decisions of the SVO Slider Measure (from Murphy et al., 2011)

Figure C.2: Self/Other Allocation Plane of the SVO Slider Measure Distribution Decisions (from Murphy et al., 2011)