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„The Role of Group Identity in Voting“

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Abstract

Group identity has been shown to bias social preferences towards favoring the ingroup at the expense of the outgroup and oneself. To study the effects of group identity on voting choices and turnout, I use the minimal group paradigm to assign group identities to both citizens and two candidates. Citizens are then signaled which candidate would yield a higher material payoff for the whole group. Most conflicted subjects (i.e., the ones for which the signal about the right candidate does not correspond to their own group identity) appear to use their information wisely by voting according to their signal. However, on average 40% of the conflicted subjects who choose to vote show support for the ingroup candidate, therefore not acting on their signal. This leads to a welfare decrease and change in election outcomes in 1 out of 5 of the cases. It appears that drawing attention to citizens' group identity can bias their voting decisions leading to a decrease in welfare for all. No strong evidence is found for an increase in turnout due to the group identity motive.

Abstract

Es hat sich gezeigt, dass Gruppenidentität soziale Präferenzen zugunsten der Eigengruppe verzerrt – und zwar auf Kosten der Fremdgruppe und eigener Interessen. In der vorliegenden Studie verwende ich das Minimal-Group-Paradigma und ordne sowohl den Bürgern als auch zwei Kandidaten eine Gruppenidentität zu, um den Effekt von Gruppenidentität auf Wahlentscheidungen und -beteiligung zu untersuchen. Den Bürgern wird signalisiert, welcher Kandidat einen höheren materiellen Ertrag für die ganze Gruppe liefern würde. Unter denjenigen VersuchsteilnehmerInnen, denen das Signal den Kandidaten der Fremdgruppe empfiehlt, scheinen die meisten ihre Informationen vernünftig zu nutzen und dem Signal Folge zu leisten. 40% unterstützen jedoch – entgegen dem Signal – den Kandidaten der Eigengruppe, sofern sie sich an der Wahl beteiligen. Dies führt in 1 von 5 Fällen zu Gemeinwohlverlusten und einem veränderten Wahlergebnis. Es scheint, als könne es die Wahlentscheidung der BürgerInnen beeinflussen, wenn ihre Aufmerksamkeit auf die Gruppenidentität gelenkt wird – was wiederum zu einer Minderung des Gemeinwohls führen kann. Es liegen keine stichhaltigen Hinweise auf eine durch Gruppenidentität motivierte Erhöhung der Wahlbeteiligung vor.

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1 Introduction

1.1 Motivation

The public choice approach assumes that both representatives and voters are rational economic agents that seek to maximize their utilities (Mueller, 2004, p. 230). Candidates are assumed to compete for votes by proposing policies that align with voters' preferences (Downson, 1957, as cited in Mueller, 2004, p.440). Party loyalties, if they exist are just a reflection of self-interested behavior on the part of the voters (Witman, 1973, as cited in Mueller, 2004, p.442).

However, empirical work on voting shows that social identity plays a significant role in explaining voter's choices (Dickson & Scheve, 2006). Some social categories that are usually significant in surveys are class, religion, linguistic or ethnic groups (Dickson & Scheve, 2006), with ethnicity playing an important role especially in multi-ethnic and emerging democracies (Hoffman & Long, 2013).

Two theories have been proposed to explain these correlations. Social identity is an important determinant of voter choice either because it provides informational cues about which policies are likely to benefit one's ingroup, or voters derive some utility from supporting an ingroup candidate (Dickson & Scheve, 2006). By ignoring any possibility of strategic behavior on the part of the candidates, I am able to test the second hypothesis, namely whether voters derive some utility from supporting an ingroup candidate, even when they stand no chance of gaining anything from voting for them.

Norris and Mattes (2003) find that ethnicity is a strong predictor of party support in most of the 12 African countries analyzed. Identity voting is strongest especially in countries where ethno-linguistic differences are greatest such as in Namibia or South Africa. Bratton and Kimenyi (2008) show that, for Kenyans, voting along ethnic lines is strongest among those who define themselves in ethnic terms. Even in advanced democracies, election outcomes show evidence of identity voting. Greenwald, Smith, Sriram, Bar-Anan, and Nosek (2009) show that implicit measures of racial preferences predicted voting intentions in the 2008 presidential election in the US. More recently, the 2017 election has shown that appealing to white identity and making immigration a salient issue is a powerful strategy in gathering popular support.

Hooghe and Marks (2004) argue that both economic interests and communal identities play a role in public opinion on European integration, with the latter having a stronger effect. However, it is political cuing that transforms identity concerns into political consequences and this effect is stronger the more national elites appear divided on the issue (Hooghe & Marks, 2004). Sniderman, Hagendoorn, and Prior (2004) test whether realistic conflict approach, which focuses on economic

competition between groups or social identity approach, which takes group categorizations as key mechanism for intergroup conflicts provide a better explanation for attitudes towards immigration in Western Europe. They show through randomized experiments in a public opinion survey of Dutch citizens that situational triggers that make national identity salient mobilize support against immigration even when subjects are not predisposed to oppose it. In the U.S., Hopkins (2010) finds, using survey data from 1992 to 2009, that hostile political reactions against immigration are most likely not only after sudden influxes of immigrants, but also when political rhetoric reinforces the threat.

All these considerations of voter choice do not take into account that according to standard economic theory turnout in large elections is itself a puzzle (Palfrey, 2009). Given a large population of voters, the probability of changing the outcome through a single vote is negligible. And since participation in elections usually involves some small cost, the standard economic model predicts almost no participation (Palfrey, 2009). Proposed explanations for this phenomenon include mistaken beliefs about pivotality (Hindriks, Myles, et al., 2006, p. 327), reputation concerns (DellaVigna, List, Malmendier, & Rao, 2016) or explanations that depart from the standard economic approach such as expressive motives (Tyran & Wagner, 2016). The latter assume that voters derive a utility simply by showing their support for a candidate or expressing their values without any expectation of influencing the outcome. I consider one other expressive motive that might motivate people to vote, namely the possibility of expressing support for one's ingroup by voting for the candidate representing it.

Group identity, as originally proposed by the social psychologists Tajfel and Turner (1979), is a form of social identification with a particular group that forms the basis for intergroup and within-group interaction. Groups can range from social class, gender, ethnicity, religion or football teams to arbitrary groups induced in the laboratory. Experiments within social psychology and economics show that group identity plays an important role in explaining a variety of social phenomena such as prejudice, discrimination, cooperation, and punishment decisions (Lane, 2016; Balliet, Wu, & De Dreu, 2014; Chen & Li, 2009). In voting, it has been used to show how it influences preferences for redistribution (Klor & Shayo, 2010), and policy choices (Böhm, Rockenbach, & Weiss, 2013).

The experimental method and more specifically the minimal group paradigm (Tajfel, Billig, Bundy, & Flament, 1971) for assigning group identities is particularly suited for investigating the effect of group identity on decision-making. With random assignment into groups, the researcher does not need to worry about the influence of confounding factors that plagues natural group experiments. Using artificially induced identities in the laboratory rather than natural groups eliminates the problems of omitted variable bias explanations (Lane, 2016). However, the disadvantage is losing part of the external validity that comes with using natural groups. One could argue that such experiments provide a lower bound for the group identity effect. However, one meta-analysis has

shown that effects of group identity on discrimination were highest when the groups were divided based on social or geographical characteristics, followed by induced group identities and the least discrimination when based on natural groups such as nationality or ethnicity (Lane, 2016). When it comes to using more salient group identities such as those based on ethnicity, part of the internal validity may be lost, due to correcting behavior of individuals when they are under the influence of social norms that prescribe equal treatment of groups. With less salient identities, such as those based on artwork preference induced in the lab, this correcting behavior might play a weaker role.

Therefore, by using the minimal group paradigm for randomly assigning 'candidates' and 'citizens' group identities, I can investigate whether and to what degree it influences voting decisions and turnout. Are individuals willing to sacrifice their own and the group's material interest in order to support an ingroup candidate that cannot reciprocate in any way?

The design of the experiment is based on a common interest situation of voting between candidates similar to the Condorcet Jury model (Condorcet, 1785). In this setup, one candidate is better in material terms for everyone. Subjects receive private, noisy, but uncorrelated signals that provide information about which candidate serves the 'common good' and can choose to vote at a cost or abstain. This setup was also used by Mechtenberg and Tyran (2016) as their baseline treatment, but it involves costly information acquisition instead of costly voting. In the treatment, each subject is assigned a group identity at the beginning of the voting game based on artwork preferences, including the two randomly chosen candidates. The design gives rise to two types of voters: non-conflicted and conflicted. Non-conflicted subjects are those for which the signal about which candidate gives the group the highest payoff and their assigned group identity match. They are crucial for investigating the effect of group identity on turnout through the comparison of their turnout with that of control subjects who are not allocated a group identity. Conflicted subjects are those for which the signal and their assigned group identity are not aligned. Their voting behavior is relevant for the study of the tradeoff between group identity and material self- and group interests.

To model this situation, I use the framework of Ghosal and Lockwood (2009). In their model, the authors take into account an instrumental payoff from a common-valued state of the world and an instrumental payoff from a private preference, which I take to be the group identity motive. For instance, agents might prefer to vote their ingroup candidate, but they also receive noisy information about which candidate is more 'competent'. As an extension to their model I add a purely expressive identity motive that is independent of the outcome. In this case, agents derive a benefit from supporting their ingroup candidate, regardless of whether the candidate actually wins the election.

The cost of voting is fixed and was chosen such that the only equilibrium for the control condition

occurs when every subject abstains. Based on previous laboratory studies of voting (Mechtenberg & Tyran, 2016), it is expected that more subjects will pay the cost to vote than would be expected according to the equilibrium prediction. Mechtenberg and Tyran (2016) find that even in the high cost condition where only 14% of subjects are expected to pay to acquire information, more than 50% do so. Therefore, if the cost is set too low and all subjects in the control choose to vote, it is no longer possible to distinguish whether the expressive identity motive increases turnout. The equilibrium predictions for the treatment conditions depend on how much weight subjects place on their group identity relative to the common good and how much expressive utility they derive from voting according to their identity.

Three equilibria are possible given the high cost of voting. First of all, if the expressive utility from voting according to group identity is low, then the only equilibrium occurs when everyone abstains. If the expressive utility is high enough, then two situations arise. If all subjects value their group identity more than the common material good, then they will all vote according to their identity ignoring the signals. If all subjects value their group identity less than the common material good, then only non-conflicted subjects will vote. However, these predictions are based on the homogeneity of preferences for all subjects and assumptions about the underlying utility functions. It is therefore expected that subjects in the experiment would show a more varied pattern of behavior.

Results show that despite the high cost of voting, there is evidence of high turnout in both conditions. The turnout in the control serves as a baseline of comparison with the treatment. However, it cannot be explained by pure self-interest consideration. Other possible explanations include voters acting as conditional cooperators, having other expressive motives for voting such as voting as a duty, experimenter demand effects or boredom. There is evidence of voters behaving as conditional cooperators, since consistently subjects are more likely to vote when they believe that others vote at a high rate (Figure 2 in Appendix). For instance, in the treatment, belief in an additional person voting increases the odds of voting by a factor of 2.4 (Table 5, column (4) in the Appendix). Although the turnout of non-conflicted voters is higher than that of the control (72% versus 50%), the difference is not statistically significant. Therefore, I conclude that there is insufficient evidence to show that the expressive identity motive plays a significant role in turnout. However, the comparison is based on a limited number of observations ($n = 18$ for the control and $n = 16$ for the treatment).

In the treatment, turnout of conflicted subjects is much lower than that of non-conflicted subjects suggesting that individuals do place a non-negligible value on their assigned identity. Most conflicted subjects who turn out choose to vote their signal. However, there are conflicted subjects who vote according to their group identity (60% versus 40%). Given the small size of the voting groups ($n = 9$) and the possibility of abstention, these subjects represent 16% of the votes. This decision of conflicted subjects to vote their identity decreases the expected efficiency of the election

outcome. If one considers conflicted voters that have been only once been conflicted during the two voting periods, 67% of the ones who turn out choose to vote for the ingroup candidate.

In a second treatment, subjects receive information about the proportion of group types in the electorate and this proportion varies from period to period. There is no evidence supporting the hypothesis that minority subjects vote more often (Levine & Palfrey, 2007). However, there is evidence that a close election when group types are close to equal in the electorate motivates people to turnout at a higher rate (Levine & Palfrey, 2007).

The average expected efficiency loss due to voting against signal is 4% in the control, 5% in the treatment without knowledge of group composition and 8% in the treatment with knowledge of group composition. The 'right' candidate won in 3/4 elections in the control, 4/8 elections in the first treatment, and 8/20 in the second treatment. If all conflicted subjects who decided to vote had done so according to their signal, it would have resulted in average improvement of 20% of the election outcomes for the treatment without knowledge of group composition. This suggests that in this sample 1 in 5 election outcomes could be overturned due to group identity preferences towards candidates.

If citizens regard voting not as a choice based on careful economic and self-interest considerations, but as a means of expressing their group identity, then other issues critical to the workings of democracy such as accountability and performance are set aside. The political consequences of identity voting can not only lead to a widening of existing ethnic divisions and government incompetence (Norris & Mattes, 2003; Bratton & Kimenyi, 2008), but also to widespread support for anti-immigration (Sniderman et al., 2004; Hopkins, 2010) and anti-integration policies (Hooghe & Marks, 2004), regardless of the economic merits of such policies. Through this experiment, I show that these concerns are justified, given that some conflicted subjects supported the ingroup candidate at a material cost to themselves and the group even though the candidate could not reciprocate in any way.

In the following, I provide an overview of the literature on voting and group identity experiments. In section 1.2 I consider group identity experiments in social psychology and experimental economics with natural and induced identities. In section 1.3 I present the voting experiments that have used induced group identity and their results on voting behavior. In section 1.4. I consider turnout in elections in relation to the paradox of voting and the expressive voting literature.

1.2 Group identity experiments

Social identity theory

The social identity theory developed by Tajfel and Turner (1979) aimed to supplement the realistic conflict theory (Sherif, 2010) by explaining the underlying process for the development and maintenance of group identity that forms the basis for intergroup discrimination. According to Tajfel and Turner (1979), social identity represents those aspects of an individual's self-image that derive from their perceived membership to certain groups.

According to Tajfel and Turner (1979), social identity theory rests on three major components: categorization, identification, and comparison. Social categorization is a cognitive process that helps classify the social environment and define an individual's place within it. Through identification with a certain group, the individual internalizes group membership as an aspect of their self-concept. The evaluation of one's own group is then determined through social comparison with other groups (Tajfel & Turner, 1979).

Tajfel and Turner (1979) assume individuals strive to achieve and maintain their self-esteem, which is tied to their social identity. According to them, positive social identity can be achieved through favorable comparison with relevant outgroups. The main aim of intergroup differentiation is to assert superiority of ingroup (Tajfel & Turner, 1979). For this to happen the individual has to internalize group membership, the situation must allow for social comparisons, and the outgroup must be perceived as a relevant comparison group (Tajfel & Turner, 1979).

Minimal group paradigm

In order to investigate the effects of the social identity approach in the laboratory, Tajfel et al. (1971) use the minimal group paradigm. In their experiments, strangers are allocated into groups based on arbitrary criteria such as a coin toss, or artwork preference. The most important criteria for minimal groups according to Tajfel et al. (1971) are:

1 Random assignment to non-overlapping groups

2 No social interaction

3 Anonymous group membership

4 No tradeoff between self-interest and group members' interest

Social psychology experiments

What follows from such arbitrary classifications is a striking range of ingroup favoring biases. Individuals rate the personality of their ingroup members as more pleasant and rate their work better, perceive the outgroup as having more homogeneous characteristics, and make self-serving attributions (Brewer, 1979; Brewer & Kramer, 1985).

Tajfel et al. (1971) find that arbitrary group categorization leads to favoritism towards the ingroup and discrimination against the outgroup in the distribution of rewards and penalties. These results cannot be explained by individual self-interest or previous hostility. The subjects' decisions showed that achievement of maximum difference between groups was more important than efficiency or fairness concerns. This result is striking, because it implies that individuals seem to care more about the relative position of their group rather than their ingroup's absolute position. Turner, Brown, and Tajfel (1979) show that the same results hold when criterion 4 is not satisfied. Subjects sacrifice their monetary self-interest in order to give less to the outgroup member.

In a review of the cross-cultural research and laboratory experiments on group identity, Brewer (1999) concludes that intergroup discrimination is primarily due to ingroup favoritism, not to hostility towards the outgroup. Balliet et al. (2014) also reach the conclusion that discrimination is the result of ingroup favoritism rather than outgroup derogation.

However, an alternative explanation for the group effect is proposed by Yamagishi, Jin, and Kiyonari (1999), who argue that the underlying mechanism is expectation of reciprocity among ingroup members. Their bounded generalized reciprocity theory is based on an evolutionary approach to cooperation and maintains that, because groups were important for the survival of individuals, humans strive to maintain a good reputation to avoid the cost of exclusion and benefit from reciprocity. The theory states that a decision heuristic that promotes ingroup favoritism has evolved due to generalized expectations of cooperation from ingroup members (Balliet et al., 2014).

Balliet et al. (2014) provide a meta-analysis on intergroup discrimination in cooperative decision-making and also test whether social identity theory or bounded generalized reciprocity fits the data better using dictator, trust, and social dilemmas games. They find a small to medium effect size for cooperation with the ingroup compared to the outgroup. They also find stronger ingroup favoritism in games involving interdependency and a slight tendency in situations with no mutual interdependency. The fact that they find stronger ingroup favoritism in situations of common knowledge of group membership, and in simultaneous as opposed to sequential games speaks in favor of the bounded generalized reciprocity theory.

Group identity in economics

Akerlof and Kranton (2000) were the first to introduce group identity into economic analysis. They assume that a person's sense of self depends on their membership to different social groups while their payoffs depend on social status of their category and whether their own and other members' actions follow the prescribed behavior for their group. This model applied to gender discrimination in the workplace, poverty and social exclusion, and the household division of labor shows how including group identity changes economic outcomes (Akerlof & Kranton, 2000).

Experiments with natural groups

Various field experiments in economics have studied social norms in the interaction between groups. Bernhard, Fehr, and Fischbacher (2006) investigate the altruistic and punishment behavior of two native social groups from Papua New Guinea using a dictator game with the possibility of third-party punishment. They find that individuals are more likely to punish norm violations if the victim of the violation belongs to the punisher's group, but at the same time give lenient punishment for ingroup norm violations to ingroup members. They also find that voluntary compliance to the egalitarian norm is stronger within the group than across groups (Bernhard et al., 2006).

Goette, Huffman, and Meier (2012) investigate the effect of group membership on cooperation and norm enforcement using as natural groups the different platoons in the Swiss army. They find more cooperation when subjects interact with ingroup members versus outgroup members in a simultaneous prisoner's dilemma game with and without punishment possibility. Although assignment does not lead to higher levels of punishment towards outgroup members, third-party punishment is higher when a violation affects an ingroup member as opposed to an outgroup member (Goette et al., 2012).

Induced identity experiments

In experimental economics, various studies have examined the role of induced group identities on social preferences. Eckel and Grossman (2005) study the effects of various degrees of group identity on cooperative behavior in a repeated public goods game framed as a team production problem. They find that assignment alone is insufficient to overcome self-interest, but other group tasks designed to enhance group identity, such as problem-solving tasks lead to higher levels of cooperation.

Yamagishi et al. (1999) find that players show higher cooperation towards ingroups than outgroups in a simultaneous move prisoner's dilemma game, but no such effect is observed for the sequential game. Their main explanations for the mechanism behind minimal groups is the expectation of generalized reciprocity, which is no longer necessary in the sequential move game, where direct reciprocity is possible. They argue that social identity plays a role in minimal groups only when

expectations of ingroup favoritism prevail. Balliet et al. (2014) also find that across studies, discrimination is stronger in simulataneous move games than in sequential games.

Chen and Li (2009) show to what extent social identity affects individual behavior in various types of games and estimate the effects on social preferences. Chen and Li (2009) use the minimal group paradigm based on artwork preference, as well as random assignment. A problem-solving task and an other-other allocation game are also used to enhance attachment to the group. The problem solving task involved group communication via a chat program on computers and consisted in choosing the correct artist of two paintings individually, but with the possibility of consulting the other ingroup members. A no chat treatment was also included. The games that Chen and Li (2009) used to study the social preferences of participants were other-other allocation tasks as are common in the social psychology literature, two-person sequential games with either no cost of punishment, cost of behaving altruistically, and cost of punishment. No feedback was given to the participants during the experiment.

They replicate the social psychology findings using the allocation tasks, the difference between ingroup and outgroup allocations being between 32.2 and 38.4 percent. They also find that participants show more charitable behavior and less envy when they are matched with an ingroup member as opposed to an outgroup member. Participants are also more likely to reward more and punish less members of their group and choose welfare maximizing actions when matched with an ingroup member (Chen & Li, 2009). The authors find that random assignment is as effective as group assignment based o artwork preference, and that the chat does not have a significant effect on behavior, but increases self-reported measures of attachment towards the ingroup. The problem-solving task increases group attachment, while the other-other allocation task shows no such effect.

Lane (2016) performs meta-analysis of 77 experimental studies in economics using both natural and artificial groups to measure their effect on discrimination. He finds significant discrimination based on group identity in a third of the studies. The effect size varies with the type of group identity, with the strongest discriminatory behavior observed when groups are divided based on social or geographical characteristics, followed by induced group identities and the least discrimination when based on natural groups such as nationality or ethnicity (Lane, 2016). However, Balliet et al. (2014) find no difference in intergroup discrimination between natural and experimentally induced groups. Lane (2016)'s analysis shows that discrimination is stronger in third-party allocation games than in decision-making games. He also finds evidence for both taste-based and statistical discrimination based on expectations and beliefs.

Group identity and leaders

One application of group identity on political behavior comes from a study by Haslam et al. (2001) on leadership. They found that leaders who affirm and promote the ingroup identity are perceived as more charismatic than identity-negating leaders and are protected from negative attributions, even in the context of a bad crisis (Haslam et al., 2001).

In another study, Platow and van Knippenberg (2001) measure the strength of endorsement of group leaders who differed in the degree of ingroup prototipicality and the fairness of intergroup distribution. Among low identity subjects, stronger endorsement was given to fair versus unfair distributive leaders, while among high identity subjects, prototypical leaders received higher endorsement regardless of the distribution fairness and less prototypical leaders received higher endorsement only when their distribution judgements showed ingroup favoritism (Platow & van Knippenberg, 2001). This implies that leaders can gather support from their group regardless of their actions when they show characteristics of the ingroup (McDermott, 2009).

1.3 Group identity in voting experiments

A number of experimental studies have investigated the effect of group identity on voting behavior. One such study investigates the tradeoff between group identity and payoff maximization (Bassi, Morton, & Williams, 2011) by giving participants a financial incentive to deviate from their group identity. Another study shows that group identity matters in voting for redistribution (Klor & Shayo, 2010). Böhm et al. (2013) find that group identity leads to a bias in decisions between policies based in the identity of the candidate proposing them. Landa and Duell (2015) investigate how identity influences voters' and candidates' decisions in a principal-agent voting game.

Bassi et al. (2011) study a voting situation in which they create a conflict between group identity viewed as an expressive motive group and instrumental motive by giving a financial incentive to subjects to deviate from their group identity. Their hypothesis is that subjects will vote against their group identity if they value financial incentives over the benefits of their assigned identity. They also vary how much information subjects have about the distribution of types of the other voters; in the complete-info treatment, the distribution of types was known, whereas in the incomplete info treatment only two other voters' types were known. An additional treatment is to vary the size of the financial incentives. Subjects make decisions in groups of five and their payoffs depended not only on election outcomes, but also on how they voted independent of the effect of their vote (Bassi et al., 2011). When subjects receive financial incentives, they had a positive incentive to vote against their identity when they were in the minority if the majority was voting their identity regardless of how many other voters of their type were voting against their identity (Bassi et al., 2011). In the complete info treatment, they find support for the equilibrium prediction that voters will vote according to their type when in majority, regardless of the financial incentives. However, when voters are in minority they vote according to their type only in the no-payment treatment.

In the incomplete info treatment, the influence of group identities is much stronger and remains unaffected by the level of the financial incentive (Bassi et al., 2011). They therefore show that even minimal group identities can have an effect in voting when instrumental motives are negligible.

Böhm et al. (2013) investigate whether an induced group identity leads to bias in voting choices. In their within subject design, voters make pairwise decisions between the same policies on redistribution between ingroup and outgroup, but proposed either by an ingroup candidate or by an outgroup candidate. By using the strategy method, they keep pivot probabilities constant across voter's choice. Voter's choices provide support for the assumption of a positive identity utility, which is moderated by the strength of a voter's group identification (Böhm et al., 2013). They find that three quarters of voters behave according to a positive identity utility, and a third of voters change their choice among policies at least once in order to vote for an ingroup candidate.

Klor and Shayo (2010) show that social identity affects individuals' on preferences over redistribution. Subjects divided into groups based on field of study had to make decisions over possible redistribution schemes, consisting of either a linear tax or a lump sum tax, while being informed only of their own income, the overall mean income, and the mean income of each group (Klor & Shayo, 2010). They find that group identification biases people's preferences in favor of redistribution schemes that benefit the average ingroup member, even if this comes at a cost to themselves. Subjects tend to vote for high levels of redistribution when their ingroup is relatively poor, even when they themselves are rich, and vote for low redistribution when their ingroup is relatively rich, even when they are poor, which excludes inequality aversion as a driving factor of these preferences (Klor & Shayo, 2010). However, the willingness to forgo one's own monetary payoff in favor of benefit the ingroup does respond to monetary incentives (Klor & Shayo, 2010).

Landa and Duell (2015) study the effect of group identity on the elected representatives' effort and their reelection using the electoral principal-agent environment. Overall, they find a significant bias of ingroup bias among voters. Voters tend to forgive low effort and low competence of ingroup representatives, while the same voters tend to adopt a more self-interested approach when evaluating outgroup representatives (Landa & Duell, 2015). However, there are some voters who resist ingroup favoritism and even attempt to overcompensate for this effect (Landa & Duell, 2015).

1.4 Explaining turnout in voting

Paradox of voting

One of the challenges for the economic theory on voting is explaining voter turnout (Palfrey, 2009). According to standard economic theory, individuals should vote only if the expected benefit

of doing so outweighs the cost of voting. However, in large elections the probability of casting the decisive vote, or pivotality, is very low rendering the expected benefit negligible. This implies that the optimal strategy is to abstain if voters care only about the instrumental value of voting (Tyran & Wagner, 2016). The paradox of voting consists of the fact that of everyone follows the rationality argument, then nobody should vote. However, in this case, the pivotality would be one and therefore the rational choice would be to vote if the benefit outweighs the cost (Palfrey, 2009).

Experiments on turnout

In a model characterized by sufficient uncertainty about other voters' incentives to vote, an equilibrium could be reached in which only voters with small voting costs will vote (Palfrey & Rosenthal, 1985). However, the question still remains of why there is significant turnout in elections (Palfrey, 2009).

Using the rational choice model of voter turnout (Palfrey & Rosenthal, 1985), Levine and Palfrey (2007) test the equilibrium predictions in a laboratory experiment. Their hypotheses derived from the model prediction include: the size effect, the competition effect, and the underdog effect. Their size effect hypothesis states that turnout should decrease with the number of voters. Their competition effect hypothesis states that turnout should be higher the closer the number of voters favoring each candidate is to 50 %. Their underdog hypothesis states that turnout should be higher for the supporters of the minority candidate than the majority candidate.

The experiment is run with electoral groups of 3, 9, 27, and 51 and there is a tossup election, where the one candidate receives an additional supporter, and a landslide election, where one candidate receives two times as many supporters (Levine & Palfrey, 2007). In the three-voter case, there is a reverse underdog effect, that is the majority candidate supporters should have higher turnout (Levine & Palfrey, 2007). They also vary the cost of voting. The authors conclude that all of the above effects are observed in the data.

Expressive voting

Another strand of literature explains the high turnout observed in election by assuming individuals derive a benefit from the act of voting itself, instead of the outcome of the election (Tyran & Wagner, 2016). Such expressive motives could include acting out of duty, confirming an identity, or expressing an opinion (Hamlin & Jennings, 2011). When instrumental and expressive motives for voting conict, which one dominates will depend on the costs associated with making a wrong decision. Expressive motives might come to dominate, when the costs associated with voting for either alternative are low due to low pivotality, which could lead to inefficient outcomes if voters

support causes they do not really wish to win or more efficient outcomes if voters support prosocial choices (Tyran & Wagner, 2016). However, the experimental evidence for this low cost theory of voting is mixed (Tyran, 2004; Tyran & Sausgruber, 2006; Feddersen, Gailmard, & Sandroni, 2009; Shayo & Harel, 2012).

Group identity and turnout

Robalo, Schram, and Sonnemans (2017) study the effect of group identity, other-regarding preferences and their interaction on political participation in a setting of group competition. Their participation game that measures political participation involves two groups competing for victory, which depends on costly participation. They find that participation is positively influenced by other-regarding preferences. There is also a weak effect of a positive ingroup bias on participation, with participants reporting stronger attachment to their group also participating at higher rates (Robalo et al., 2017).

Fowler and Kam (2007) consider altruistic and social identification motives for political participation. They argue that non-material benefits need to be taken into account as motivating factors of political participation. They use three dictator games of lottery allocations between themselves and a Democrat, Republican and an anonymous member and correlate these choice with survey questions on political participation. They find a strong ingroup bias and also that altruism and social identity increase political participation. Schram and Sonnemans (1996) examine the experimental evidence for the determinants of voter turnout. They find that increased group identity and communication increased turnout using a participation game.

On the other hand, some studies report bandwagon effect of voting, namely citizens are more likely to vote for who they think is the winner. Morton, Muller, Page, and Torgler (2015) look at data from the French presidential election. They find that voters in French overseas territories cast their vote despite the fact that the exit poll has been made public. Turnout after the exit poll decreased only by 11%, leaving the rest of the votes explainable only as due to expressive utility (Morton et al., 2015).

1.5 Details of the experimental design

First of all, the experimental design reproduces a common interest situation in voting based on the Condorcet Jury model (Condorcet, 1785). However, the two options available to the participants represent two candidates of two different group identities. One of the candidates is randomly chosen in each round to be the better candidate in material terms for everyone. In other words, if elected, this candidate gives everyone in the voting group a high payoff. Each subject in the voting

group is also allocated one of two group identities based on the minimal group paradigm. As in the Condorcet Jury model, no subjects knows with certainty which candidate is better for the group, but each subjects receives a private uncorrelated signal with better than chance accuracy about which possible candidate is better. Based on the signal and the group identity, each subject in the treatment can be classified as either non-conflicted or conflicted depending on whether their signal and their group identity are aligned or not. For conflicted subjects a tradeoff arises between material interest tied to the common good and group identity preferences. Their voting choice is of interest, because it allows one to answer the question of whether they are willing to sacrifice material and group self interest in order to show support for an ingroup candidate, when the signal suggests the outgroup candidate is better for everyone.

Secondly, a control group without group identity is used to capture all other motives for voting unrelated to group identity. The comparison between non-conflicted and control subjects allows one to answer the question of whether group identity induces higher turnout. On the one hand, group identity has been shown to increase turnout, but only in a setup involving competition between groups (Robalo et al., 2017). On the other hand, most of expressive voting literature has focused on ethical or redistribution motives (Tyran & Wagner, 2016). Comparing non-conflicted and control subjects allows to measure the effect of expressive identity motive for voting. However, in the model I do not consider any other-regarding preferences, which might also affect turnout, and be stronger when group identity is introduced. The literature reports that participants seek to maximize payoff differences between the ingroup and outgroup. Therefore, any other-regarding preferences that favor the ingroup might be offset similar preferences that seek to hurt the outgroup.

Thirdly, studies that have examined voting for candidates, have either focused on voting between policies proposed by candidates (Böhm et al., 2013) or sequential games in which elected representatives could choose effort levels in order to increase their chances for reelection (Landa & Duell, 2015). In this experiment, because the candidates' hands are tied, the outcome of the election is independent of the candidates and therefore no expectations of reciprocity are possible. Voting for the ingroup candidates for conflicted voters can only be due to either illusory expectation of reciprocity from the ingroup candidate, which is consistent with the bounded generalized reciprocity theory (Yamagishi et al., 1999) or due to the effect of pure categorization postulated by (Tajfel & Turner, 1979). The latter explanation is more likely, since subjects are aware that candidates have no decision power.

Majority voting with belief elicitation is used to approximate perceptions of pivotality, because it makes the voting situation more realistic compared to a random dictator version. In a random dictator design, the decision of one of the subjects is selected at random for implementation. Although, the decision probability is known to the decision maker, this reduces a voting game to an individual decision-making task (Tyran & Wagner, 2016). Unlike the original Condorcet jury model,

a cost of voting is introduced, which makes the voting situation more realistic, since it induces a tradeoff to voting, but also helps to pin down a lower threshold for the utility derived from the other-regarding preferences and expressive motives for voting. Abstention is also introduced, so as not to force participants to decide, which is especially important for weak-identity conflicted voters.

Furthermore, although group identity has been shown to influence voting decisions for redistribution in favor of the ingroup members even at the cost of self-interest (Klor & Shayo, 2010), no experiment has investigated whether people will ignore the negative externality imposed on themselves and on others of voting according to group identity in a common interest situation. The chosen signal is noisy, but informative, which leaves enough room for self-serving bias since a conflicted individual can rationalize voting for the ingroup candidate instead of for the candidate indicated by the signal by arguing that the signal might have been wrong in that particular instance. However, it is objectively clear that voting according to signal is more likely to bring about the material good outcome and is therefore the rational option. The electorate is formed of groups of 9 voters, large enough so as to diffuse individual responsibility for the vote, but not too eliminate it completely as in normal large elections. Thus, subjects are made aware of the tradeoff, but can still justify selfish or welfare decreasing actions. As in the Condorcet jury model, there is a positive externality from voting according to signal, since with every vote, the probability of reaching the correct outcome increases, and a negative externality from voting according to identity, since this cancels an informed vote.

Finally, although the effect being in minority versus majority has been shown to influence voting decisions (Bassi et al., 2011), the payoff for the individual was dependent not only on the election outcome, but also on their personal vote. In this experiment, the payoff of each voter does not depend on their own choice, but on the majority decision.

2 Model

In the following, I consider an extension of the model of Ghosal and Lockwood (2009). In their model, the authors divide the utility of each subjects into a payoff derived from a common-valued state of the world and another payoff derived from a private preference, which I interpret as the group identity motive. For instance, agents can have an instrumental benefit from voting for an ingroup candidate, but they also receive some information about which candidate will increase their material payoff if elected. As an extension to their model I add a the expressive identity payoff that each agent receives when he or she chooses the preferred ingroup candidate, regardless of the outcome of the election. However, the model does not capture other expressive motives for voting, such as acting out of a sense of duty, and also fails to take into consideration other-regarding preferences that people might have for bringing about the common-good for others or

towards their ingroup and outgroup.

Another paper by Morgan and Várdy (2012), considers only the instrumental payoff from the common-valued state of the world and an expressive payoff that is independent of the outcome. However, it is likely that people choose to vote against their material self-interest, because they want their preferred alternative or candidate to win, and not only because they derive a non-material benefit just from the act of supporting a preferred alternative. The difference between these preferences can be likened to wishing a particular candidate wins compared to actually voting for that candidate.

As in Ghosal and Lockwood (2009), there is a number $N = \{1, 2, ..., n\}$ of agents who can vote between two alternatives, $L = \{A, B\}$. In this case, I consider the alternatives to be the two candidates. The payoffs their agents derive depend both on the state of the world and their private preference for one alternative. The private preference is, in this case, the assigned group identity. The weight they attach to the group identity is $\lambda \in [0, 1]$. They assume that this weight is common to all voters and λ can be interpreted as a measure of a voter's bias for the ingroup candidate. According to Ghosal and Lockwood (2009), when $\lambda = 1$ an agent has no preference regarding the state of the world, but only for her private preference in favour of one alternative, and when $\lambda = 0$ she has a preference only for the state of the world. In addition, each agent receives an additional payoff from voting according to his or her private preference, regardless of the election outcome. The utility function is thus:

$$(1 - \lambda)v(L, s^i) + \lambda u(L, t^i) + \epsilon u(L, t^i), \lambda \in [0, 1] \tag{1}$$

where $s^i \in \{s_A, s_B\}$ is the state of the world, and $t^i \in \{A, B\}$ is the variable determining voter i' favoured alternative according to group identity (Ghosal & Lockwood, 2009).

$$u(L, t^i) = \begin{cases} 1 & if t^i = L \\ 0 & otherwise \end{cases} \tag{2}$$

$$v(L, s^i) = \begin{cases} 1 & if s^i = L \\ 0 & otherwise \end{cases} \tag{3}$$

As in Ghosal and Lockwood (2009), the sequence of events is as follows:

Step 1 : The state of the world is determined, and each agent $i \in N$ privately observes his group identity t^i, and the informative, but noisy signal about the state of the world, $\sigma^i \in \{A, B\}$.

Step 2 : Each agent $i \in N$ decides whether to pay the cost to vote. Unlike in Ghosal and Lockwood (2009), the cost is the same for each agent.

Step 3 : Those who have paid the cost can vote for either candidate A or B; for each agent one is an ingroup candidate, while the other is an outgroup candidate.

Step 4 : The winner of the election is selected by majority voting. In case of ties, one candidate is selected with probability 0.5.

Similar to Ghosal and Lockwood (2009), agents' types are assumed to be independently identically distributed over A, B with $Pr(t^i = A) = Pr(t^i = B) = 0.5$. It is common knowledge that $Pr(s^i = A) = Pr(s^i = B) = 0.5$. Signals are informative, since $Pr(\sigma^i = L|s_L) = q > 0.5$ Conditional on s^i, the signals are independently identically distributed. This case corresponds to the the Condorcet Jury model (Condorcet, 1785), but with an added cost of voting. The relevant equilibrium concept to consider is Bayesian equilibrium, with three additional assumptions as in Ghosal and Lockwood (2009). First, it is assumed that all agents behave the same in equilibrium (symmetry). Second, mixed strategies are ruled out. Third, it is assumed that a player's equilibrium strategy is weakly undominated (Ghosal & Lockwood, 2009).

First of all, it is likely that in an election, citizens have some information about the more competent candidate, but that this informations is likely imperfect (Ghosal & Lockwood, 2009). As in the Condorcet Jury model (Condorcet, 1785), the information is assumed to be heterogeneous. However, the stronger assumption of uncorrelated information might fail to hold in elections. For instance, if every citizen is exposed to the same kind of information from the media.

Secondly, the model describes at step 2 a simultaneous move game, since each citizen's decision about whether to turn out is made not knowing the action of the others. However, this assumption makes no difference for the equilibrium at the voting stage (Ghosal & Lockwood, 2009).

Finally, when $\lambda = 0$, all agents vote according only to their group identity. This corresponds to the model of Börgers (2004). When $\lambda = 1$, all agents vote according to their signals. This corresponds to the model of Mechtenberg and Tyran (2016) with costly information acquisition instead of costly voting for the baseline treatment. The two situations are equivalent.

2.1 Voting Stage

As in Ghosal and Lockwood (2009), at the voting stage, a strategy for agent i maps his group identity and information (t^i, σ^i), into a decision to vote for candidate A or B. An agent votes according to her group identity if she votes for the candidate that matches her group identity t^i, whatever her signal σ^i. An agent votes according to her signal if she votes for the candidate that matches her signal σ^i, whatever her group identity t^i. Due to the added expressive identity preference, the value of the threshold where agents switch from voting according to signal to voting according to group identity is decreased compared to the model of Ghosal and Lockwood (2009).

Result 1: A critical value $0 < \hat{\lambda} < 1$ exists with $\hat{\lambda} = (q - 0.5 - 0.5\epsilon)/q$, such that
(i) if $\lambda \geq \hat{\lambda}$, there is a symmetric best response at the voting stage in which those who decide to turnout vote according to their group identity;
(ii) if $\lambda \leq \hat{\lambda}$, there is a symmetric best response at the voting stage in which those who decide to turnout vote according to their signal.

Explanation: Agents vote according to their group identity only if their group identity is a sufficiently important component of their preferences. Information aggregation occurs only if $\lambda < \hat{\lambda}$. Otherwise, the outcome is the same as if the voters did not observe any signals (Ghosal & Lockwood, 2009).

As in Ghosal and Lockwood (2009), if there are l other voters, voter i is pivotal only in two cases:

(1) when l is even and $l/2$ agents vote for A and $l/2$ vote for B

(2) when l is odd and $(l+1)/2$ agents vote for A, and $(l-1)/2$ vote for B or vice versa.

For the equilibrium, i's voting strategy has to be a best response in each of the above cases. Two cases need to be considered: when all agents vote according to their group identity and when all agents vote according to their signal (Ghosal & Lockwood, 2009).

If we assume all other agents $j \neq i$ vote with their group identity and case (1) applies and $t^i \neq \sigma^i$ corresponding to the case of conflicted voters.

- Assume agent i votes for her group identity t^i. Since she is pivotal, the outcome is t^i, for which her payoff is: $\lambda + \epsilon + (1-\lambda)(1-q)$. The first two terms correspond to the utility from voting according to group identity, $u(L, t^i) = 1$, while the last term corresponds to utility from voting against the signal. The signal is correct with probability q. Therefore voting against it can bring a utility when the signal is incorrect, which happens with probability $(1-q)$.
- Assume agent i votes for her signal σ^i. Since she is pivotal, the outcome is σ^i, for which her payoff is: $(1-\lambda)q$. In this case $u(L, t^i) = 0$.

The agent i chooses to vote with her signal if $\lambda+\epsilon+(1-\lambda)(1-q) \geqslant (1-\lambda)q \Leftrightarrow \lambda \geqslant (q-0.5-0.5\epsilon)/q = \hat{\lambda}$.

In the model by Ghosal and Lockwood (2009) without the expressive identity motive ϵ, the threshold $\hat{\lambda} = (q - 0.5)/q$. Therefore adding the expressive identity motive, decreases the threshold ad therefore makes it more likely that the agent votes according to her group identity.

As in Ghosal and Lockwood (2009), if all other agents $j \neq i$ vote according to their signals and case (1) applies, then agent i infers that $l/2+1$ A signals and $l/2$ B signals have been observed. Her belief is that the state of the world s_A has occurred with probability q. The payoffs are the same as in the first scenario. She prefers to vote according to the signal if $\lambda \leqslant \hat{\lambda}$.

If case (2) applies and assuming without loss of generality that $\sigma^i = A$

(2.1) $(l+1)/2$ voted for A and $(l-1)/2$ voted for B. Agent i infers that if she is pivotal, there are 2 more A than B signals, which means that $P(\sigma^i = s) = \dfrac{q^2}{q^2+(1-q)^2} = X$. The expected payoff for voting according to signal: $X(1-\lambda)$. The expected payoff for voting according to private preference: $\lambda + \epsilon + (1-X)(1-\lambda)$.

(2.2) $(l+1)/2$ voted for B and $(l-1)/2$ voted for A. Agent i infers that if she is pivotal, the number of both types of signals is equal, which means that $P(\sigma^i = s) = 0.5$. The expected payoff for voting according to signal: $0.5(1-\lambda)$. The expected payoff for voting according to private preference: $\lambda + \epsilon + 0.5(1-\lambda)$.

As in Ghosal and Lockwood (2009), given that l odd, i cannot know which of the two cases has occurred (2.1.) or (2.2.) when she decides to vote. If we take l_A to be the number of other voters who receive the signal $\sigma^j = A$

(2.1) $P(l_A = (l+1)/2 | \sigma^i = A) =$
$= \sum_{k=A,B} P(l_A = (l+1)/2 | s = s_k) P(s = s_k | \sigma^i = A) =$
$= B((l+1)/2 : l, q)q + B((l+1)/2 : l, 1-q)(1-q)$

(2.2) $P(l_A = (l-1)/2 | \sigma^i = A) =$
$= \sum_{k=A,B} P(l_A = (l-1)/2 | s = s_k) P(s = s_k | \sigma^i = A) =$
$= B((l-1)/2 : l, q)q + B((l-1)/2 : l, 1-q)(1-q)$

The relative probability of case (2.1)=$q^2 + (1-q)^2 = Z$. The overall expected payoff to i from voting according to signal is:
$Z[(1-\lambda)X - \lambda - \epsilon - (1-\lambda)(1-X)] + (1-Z)[(0.5(1-\lambda) - \lambda - \epsilon - 0.5(1-\lambda)] =$
$= (1-\lambda)(2q-1) - \lambda - \epsilon$, which is $\geqslant 0$ if $\lambda \leqslant \hat{\lambda} = (q - 0.5 - 0.5\epsilon)/q$.

Given that l voters vote, if the group identity and the signal match for voter i, he is indifferent between voting for either. When the group identity and the signals disagree, and when $\lambda \leqslant \hat{\lambda}$, voting according to the signal weakly dominates all other pure strategies, while if $\lambda \geqslant \hat{\lambda}$, voting according to group identity weakly dominates all other pure strategies (Ghosal & Lockwood, 2009).

2.2 The turnout stage

Turnout is calculated by comparing the expected benefits of voting with the cost of voting (Ghosal & Lockwood, 2009). Results 2 and 3 are the same as those of Ghosal and Lockwood (2009), except that the threshold $\hat{\lambda}$ depends on the expressive identity preference ϵ.

Result 2: If $\lambda > \hat{\lambda}$, i.e. voting is according to group identity, the expected benefit of voting, conditional on t^i and given that l other agents vote is:

$$b_p(l) = \begin{cases} \lambda 0.5\binom{l}{l/2}0.5^l & if\ l\ is\ even \\ \lambda 0.5\binom{l}{(l+1)/2}0.5^l & if\ l\ is\ odd \end{cases} \tag{4}$$

Explanation: There are two situations in which an agent is pivotal. The first case occurs when the number of other voters l is even, and half of the agents vote for each candidate. If agents are voting according to group identity, from voter i's perspective other agents are equally likely to vote for either candidate, so voter i is pivotal with probability $B(l/2 : l, 0.5)$. The second case occurs when the number of other voters is odd, and the numbers of votes for the two candidates only differ by one. In this case, voter i is pivotal with probability $B((l+1)/2 : l, 0.5)$. Therefore, the benefit of voting, conditional on l is proportional to the pivot probability (Ghosal & Lockwood, 2009).

The expected benefit from voting according to group identity, given that all other agents turn out with probability p is:

$$B_p(p) = \sum_{l=0}^{n-1} b_p(p)\binom{n-1}{l}p^l(1-p)^{(n-l)} \tag{5}$$

Result 3: If $\lambda < \hat{\lambda}$ i.e. voting is according to signals, the expected benefits to voting, given that l other agents vote are:

$$B_M(p) = \sum_{l=0}^{n-1} b_M(p)\binom{n-1}{l}p^l(1-p)^{(n-l)} \tag{6}$$

$$B_D(p) = (1-2\lambda)\sum_{l=0}^{n-1} b_D(p)\binom{n-1}{l}p^l(1-p)^{(n-l)} \tag{7}$$

where M= an agent for whom the signal and type match, i.e. $\sigma^i = t^i$, while D= an agent for whom the signal and type are in conflict, i.e. $\sigma^i \neq t^i$.

$$Q(l) = \begin{cases} \sum_{k=\frac{l+1}{2}}^{l}\binom{l}{k}q^k(1-q)^{l-k} & if\ l\ is\ odd \\ Q(l-1) & if\ l\ is\ even \end{cases} \tag{8}$$

$$b_M(l) = Q(l+1) - Q(l) \tag{9}$$

$$b_D(l) = (1-2\lambda)(Q(l+1) - Q(l)) \tag{10}$$

Explanation: $Q(l+1) - Q(l)$ is the increase in probability that the alternative chosen matches the state if an agent i votes, given that exactly l other agents voted. The benefit for the D-agent is

scaled down by $(1-2\lambda)$, because when the candidate chosen is the same as the state of the world, it must disagree with his group identity.

According to Ghosal and Lockwood (2009), the payoffs for abstaining and voting according to signal for the M-agent are $Q(l)$ and $Q(l+1)$, because for the M-agent the candidate that matches the state is also best from the perspective of her group identity. Therefore $b_M(l) = Q(l+1)-Q(l)$. But the payoffs for abstaining and voting according to signal for the D-agent are $(1-\lambda)Q(l)+\lambda(1-Q(l))$ and $(1-\lambda)Q(l+1)+\lambda(1-Q(l+1))$, because for the D-agent the candidate that matches the state of the world is the worst from the perspective of his group identity. Therefore, $b_D = (1-2\lambda)(Q(l+1)-Q(l))$.

In the case when $\lambda = 0$, agents care only about the state of the world, the model reduces to the case where the benefit of voting is $B_M(p)$ and there are no longer any conflicted voters (Ghosal & Lockwood, 2009).. Non-conflicted voters might not only care about the state of the world and making the candidate that matches their type win, but also derive utility from the mere act of supporting a candidate from their group, the benefit of voting would be $B_M(p)+\epsilon$. The ϵ is a measure for how much people care about the group identity without necessarily voting to influence the outcome of the election. The same would hold for agents who vote according to their group identity $B_P(p)+\epsilon$.

2.3 Equilibrium

Result 4:

(i) if $\lambda > \hat{\lambda}$ (group identity voting), i's strict best response is to vote if $c \leqslant B_p(p)+\epsilon$. This is the unique symmetric Bayesian equilibrium.

(ii) if $\lambda \leqslant \hat{\lambda}$ (signal voting), i's strict best response as a conflicted voters is to vote if $c \leqslant B_D(p)$, while i's strict best response as a non-conflicted voter is to vote if $c \leqslant B_M(p)+\epsilon$. At least one such symmetric Bayesian equilibrium exists in which agents vote according to their group identity.

(iii) if $\lambda = 0$ and $\epsilon = 0$, i's strict best response is to vote if $c \leqslant B_M(p)$. This corresponds to the case when group identity does not play a role.

Table 1 summarizes the predictions for the treatment.

Table 1: Predictions for the main treatment

Weight of private preference	Cost of voting	Observed voting behavior
$\lambda < \hat{\lambda}$	c $> B_M(p) + \epsilon > B_D(p)$	No agent votes
There are no strong-identity voters	$B_M(p) + \epsilon > c > B_D(p)$	Non-conflicted agents vote according to signal, but conflicted weak identity agents abstain
	$B_M(p) + \epsilon > B_D(p) > c$	Non-conflicted agents vote according to signal, and also conflicted weak identity agents vote according to signal
$\lambda \geqslant \hat{\lambda}$	$B_P(p) + \epsilon > c$	All strong identity agents vote according to group identity
There are no weak-identity voters	$c > B_P(p) + \epsilon$	All strong identity agents abstain

Notes: λ is the weight of the group identity motive. $\hat{\lambda}$ is the threshold value for which a conflicted voter switches from voting according to signal to voting according to identity. ϵ is the expressive identity motive. c is cost of voting. $B_M(p)$ expected benefit of voting for non-conflicted subjects. $B_D(p)$ is the expected benefit of voting according to signal for conflicted subjects. $B_P(p)$ is the expected benefit of voting according to identity for non-conflicted and conflicted subjects. p is the probability with which all other agents vote.

2.4 Efficiency

In the following, I will consider efficiency for the case when $\lambda = 0$ and $\epsilon = 0$. Or in other words, when there no are direct utility gains from voting according to group identity, either instrumental motives or expressive motives.

Paying the cost to vote is profitable for a subject only if the marginal expected benefit exceeds the marginal cost from doing so $Q(l+1) - Q(l) > c$. However, the decision to vote also depends on the turnout of the other participants. In other words, the success probability $Q(l+1) - Q(l)$ depends on the number of voters l. The success probability strictly increases with each odd-number additional voter, but at a decreasing rate. According to the Condorcet jury theorem (Condorcet, 1785), if $l > 2$, then $Q(l) > q$ and $Q(l)$ approaches 1 as l approaches ∞ due to information aggregation.

In the following, I will present a discussion of the efficiency when also considering group identity utility gains, instrumental and expressive.

At one extreme, if individuals have strong group identity motives for voting $\lambda \leqslant \hat{\lambda}$, no information aggregation will occur since voters will not use their signals, but vote according to their group identity. The result will depend on the composition of the electorate. The candidate that matches the group identity type of the population will always win when there are no ties. Efficiency could be either very high or very low.

At the other extreme, if the cost of voting is very low, and individuals put more weight on the common state of the world than the group identity, $\lambda < \hat{\lambda}$, then all individuals will turn out and vote according to their signals. Efficiency will always be $Q(l) = 0.6$, since 60% of the voters receive the right signal, while 40% receive the wrong signal.

The third possibility is when the expressive identity benefit is low, ϵ and the weight placed on group identity is also low $\lambda < \hat{\lambda}$. In this case, no individuals will vote and efficiency will be no better than chance.

A fourth possibility is that individuals do identify with the group which makes them favor one of the candidates, but their instrumental motives trump their group identity motives $\lambda < \hat{\lambda}$. If the cost of voting is high, but the expressive identity is also high ϵ, then only non-conflicted subjects will vote. The results of the election depends on the group composition of the electorate. In the case of equal proportion of group types in the electorate, efficiency is always be only slightly above chance. In the case of only one group type in the electorate, efficiency could be either very low or very high depending on which group type dominates.

This considerations do not take into account the case where there could be heterogeneity in the weight placed on the group identity motive. The efficiency of any such case will lie between the efficiency of the extreme cases. When the probability of being pivotal decreases substantially, the instrumental parts of the utility function will tend to be very small and the purely group identity expressive motive will come to dominate. The efficiency will depend on how much individuals value the group identity and the proportion of the group types in the electorate.

3 Experimental Design

3.1 General description

Control

Subjects are assigned randomly to be either voters or candidates at the beginning of the voting game. Participants are divided into 2 groups of n players. Two subjects are randomly chosen to play the role of candidates and assigned to both voting groups. The candidates do not make any decision and are paid depending on whether they get elected or not.

I study a common interest situation. Therefore, each subject earns a payoff depending on which of the two candidates is chosen. One candidate is better for all group members, i.e. gives every voter a higher payoff if elected, but subjects do not know which one. All subjects in the electorate earn the same positive payoff if the right candidate is chosen and a lower payoff if the wrong candidate is chosen. The choice between the two candidates is made by majority voting. Subjects receive a costless signal about the expertise of the candidate: the signal is informative, but noisy i.e. when the signal says that candidate A is better than B, then A is more likely to be right, but there is still a positive probability that B is right. The signals that subjects receive are uncorrelated. After the signal is received, subjects can choose whether to vote (for candidate A or B) or abstain. Subjects can vote at a cost that is the same for everyone and common knowledge, while abstention is costless.

After each voting round, subjects are asked to estimate how many other subjects in their electorate they thing voted and how many abstained. If they are correct, they receive and additional payoff. A naturalistic labelling is used, subjects are called 'citizens' and 'candidates' and participate in an 'election'. Citizens know that one candidate is 'better'.

Main treatment

The main difference between the baseline and the main treatment is that each subjects is assigned a group identity at the beginning of the game based on relative artwork preference. Subjects are presented with five pairs of paintings by two modern artists, Klee and Kandinsky, each one by a different artist. Participants report independently which painting in each pair they prefer, without being told the artists. Based on their reported relative painting preferences, subjects are divided into two equal groups, the Klee group and the Kandinsky group. Subjects are privately informed about their group membership. The assignment remains the same throughout the experiment. This procedure is also used by Chen and Li (2009).

After being assigned into groups, subjects subsequently participate in a second task that involves group communication via a chat program on computers. They are given ten minutes to discuss via chat only among their ingroup and answer two questions about the artists of two additional paintings. The chat output is monitored and saved. Each participant submits the answers individually after the chat. Participants receive an additional payoff from correct answers. This cooperative problem-solving is used to strengthen group identity. This problem-solving task is also used by

Chen and Li (2009)

Then the two candidates of different group identities are drawn from the subject pool. The group identity of the other members is not known to participants in the first 2 periods. In these 2 periods, one voting group will have a proportion of 5 Klee and 4 Kandinsky subjects, while the second group will have a proportion of 4 Klee and 5 Kandinsky subjects. However, subjects are not informed about the proportion of ingroup and outgroup members in the electorate. As in the control, a random period is selected for payment.

Minority voting treatment

In the next 5 periods, the group identity compositions of the voting groups is revealed to the subjects before they receive the signal. For these periods, the proportion of the group identities of the subjects changes in each period and is not repeated. The proportion of the group types varies from 4:5 to 9:0. After each voting round, subjects are asked to estimate how many other subjects in their electorate they thing voted for their ingroup candidate and how many voted for their outgroup candidate. If they are correct, they receive and additional payoff. At the end of the voting game, subjects are given 'inclusion of self in other' scale which measures the extent to which they indentify themselves with another ingroup member (Gächter, Starmer, & Tufano, 2015).

3.2 Parameters

There are 2 groups of $n = 9$ citizens facing two alternative candidates: A and B in the control and the same for the main treatment. The state of the world s has two possible realizations with $P(s_A) = P(s_B) = 0.5$. All citizens get a positive monetary payoff when the candidate that matches the state of the world is chosen $U(A|s_A) = U(B|s_B) = 20$ Euros , but they get a lower payoff when it does not match the state of the world $U(A|s_B) = U(B|s_A) = 10$ Euros. The voting is game is repeated 2 times in he control and one round is randomly selected for payment. Each subject receives a private signal: $\sigma^i = A, B$ which is imperfect, but informative about the true state of the world. The accuracy of the signals is the same, but they are uncorrelated across subjects: $P(s = A|\sigma^i = A) = P(s = B|\sigma^i = B) = q = 0.6$. The choice of candidates is determined by majority voting. Subjects can decide to either vote or abstain. In order to vote subjects have to pay a fixed known cost $c = 2.5$ Euros. If nobody votes or if there is a tie, the candidate is picked randomly. The elected candidate receives a payoff of 2 Euros. If subject's beliefs match the actual number of voters, they receive an additional payoff of 1 Euro for each correct answer. For each correct painting guessed in the problem-solving task of the treatment, subjects receive an additional payoff of 1 Euro.

3.3 Predictions

The utility for the control subjects is the same as the utility of the treatment when there is no private preference ($\lambda = 0$ and $B_C(p) = B_M(p)$) and no expressive identity motive for voting ($\epsilon = 0$). Control subjects should vote only if their payoff from doing so is greater than the cost of voting. However, since the maximum possible gross private gain from voting is in the case when only one subjects votes and is equal to 1, the prediction for the control is that no subjects should vote, given the $c = 2.5$ cost of voting. However, other expressive motives for voting and other-regarding preferences could be responsible for a non-zero turnout. This is not taken into consideration by this model.

However, in the treatment, the prediction for the turnout is less clear, since it depends on the expressive identity motive (ϵ), which is unobserved. If ϵ is high enough ($\epsilon > 1.5$), it might still be rational to vote, but only for non-conflicted subjects. Conflicted subjects should never vote, since their payoff is smaller than the payoff in the control ($B_D(p) < B_C(p)$). However, given that other motives for voting might be present, there might also be conflicted subjects who choose to vote.

Because the signal is informative ($q > 0.6$), all subjects should choose to vote according to it in the control. The same holds for non-conflicted subjects in the treatment. For conflicted subjects, their decision for which candidate to vote will depend on the weight they place on the group identity (λ). If it is higher than the threshold and if the expressive identity motive is high then all conflicted subjects should vote according to their identity ($\lambda > \hat{\lambda}$ and $B_P(p) + \epsilon > c$). If is is low, then no conflicted subject should vote ($\lambda < \hat{\lambda}$). However, given that other motives for voting might be present, there might also be conflicted subjects who choose to vote for their signal.

3.4 Efficiency

Table 2 computes efficiency for the control with various numbers of voters l who vote according to signal. Gross efficiency is the sum of expected earnings in the group in Euros. In this case, each group member wins 10 Euros if the right candidate is chosen. Net efficiency is the difference between gross efficiency and the cost of voting for the l voters. Depending on the cost of voting, multiple pure-strategy equilibria, which are Pareto-rankable and also mixed-strategy equilibria exist. However, in this case, since the cost of voting $c = 2.5$ Euros there are no equilibria in which turnout is positive, because for any number of other voters, gross private gain is smaller than the cost of voting.

Table 2: Efficiency

l	$Q(l)$	Gross efficiency	$Q(l+1)-Q(l)$	Gross private gain	$c = 2.5$
0	0.50	45.0	-	-	45.00
1	0.60	54.0	0.10	1.00	51.50
2	0.60	54.0	0.00	0.00	49.00
3	0.65	58.32	0.05	0.48	50.82
4	0.65	58.32	0.00	0.00	48.32
5	0.68	61.43	0.04	0.35	48.93
6	0.68	61.43	0.00	0.00	46.43
7	0.71	63.92	0.03	0.28	46.42
8	0.71	63.92	0.00	0.00	43.92
9	0.73	66.01	0.02	0.23	43.51

Notes: l is the number of voters who votes according to signal. $Q(l)$ is the predicted success probability of the group making the right choice. Gross efficiency is the sum of expected earnings in the group in euros $9 * Q(l) * 10$. $Q(l+1)-Q(l)$ is the increase in success probability resulting from an additional voter. Gross private gain is $(Q(l+1)-Q(l)) * 10$. Net efficiency is gross eficiency $-l * c$.

3.5 Procedure

The experiment was conducted at the Vienna Center for Experimental Economics using a total of 60 participants. Subjects were recruited using the ORSEE software (Greiner, 2015). Only psychology students were excluded, since they might have already known about group identity inducement in the laboratory. The experiment was run using the z-tree software (Fischbacher, 2007). In total, 3 sessions were ran, one for the control and 2 for the treatment.

At the beginning of each session, subjects from the treatment had to do the task on artwork preference and based on their relative preference they were allocated to different group identities. Moreover, to increase group identity, subjects also had to solve 2 questions about another 2 paintings, with the possibility of chat communication within their ingroup. If they guessed correctly, they were awarded 1 Euro per question. Subjects were randomly allocated to committees of 9 members, with 2 serving the role of candidates. Stranger matching was used for each period. In the control, 2 periods were ran, while in the treatment 7 periods were ran, first 2 without feedback and the last 5 with feedback about the proportion of types in the groups.

Before the experiment began, all subjects in the control and treatment received the same instructions about the voting game (appendix section 7.2). Subjects also received 5 control questions about the voting game setup, which they had to solve correctly in order to proceed.

Subjects were informed in the instructions of the values of each parameter. In the first part, subjects were randomly allocated roles of voter or candidate and were informed about their role, which would not change throughout the experiment. In the voting stage, first each subject received a private signal about which candidate was better and were reminded of the accuracy of the signal. In the next stage, they could either choose to vote for one of the candidates at a cost or abstain. After the voting, subjects were asked to state their beliefs about how many other members of their group they thought voted in that period. For the treatment, the question was about their belief in how many other members voted for the candidate A and how many for candidate B. If their estimate was correct, they were awarded 1 Euro for each question.

In addition, for the last 5 periods in the treatment feedback was given before the voting stage about the number of ingroup and outgroup members in their committee. This numbers were varied randomly for each period, but without repetition. Lastly, in the treatment, subjects had to answer the 'inclusion of other in the self' question (Gächter et al., 2015) and were informed about their payoff. All subjects had to complete a questionnaire consisting of 3 parts: questions about socio-demographic background, attitudes toward voting and for the treatment group identity questions.

After the voting game and before the questionnaire, subjects were able to see their payoff. They were paid in cash immediately at the end of the session. Each session lasted for about 1.5 h, taking only 1 h for the control. One period was chosen randomly for payment. The average was 13 euros per subject.

3.6 Hypotheses

In the treatment, two types of voters arise. Non-conflicted voters are the ones for which the signal and their group identity are congruent, while conflicted voters are ones for which their signal and their group identity are incongruent.

- The control voters derive the benefit of voting $B_C(p) = B_M(p)$.
- The treatment non-conflicted voters derive an additional utility from voting according to their group identity, which is independent of the outcome of the election $B_M(p) + \epsilon$.
- The conflicted weak-identity voters derive the benefit of voting $B_D(p)$ for voting according to the signal.
- The conflicted and non-conflicted strong-identity voters derive the benefit of voting $B_P(p)+\epsilon$.

Hypotheses about voting behavior

Hypothesis 1a: Control subjects vote according to signal, since it is informative ($q > 0.5$).

Hypothesis 1b: For conflicted subjects, voting in the treatment is only according to their signal ($\lambda < \hat{\lambda}$). In this case, there are only conflicted weak-identity subjects and they vote according to their signal and against their group identity. If H2a is rejected, then $\lambda > \hat{\lambda}$. In this case, there are only conflicted strong-identity subjects and they vote according to their group identity and against their signal. If there is heterogeneity in the weigh subjects place on the group identity, we will observe both voting according to signal and voting according to group identity.

Hypothesis 1c: Non-conflicted voters vote according to signal and group identity, since in their case the two indicate the same candidate.

Hypotheses about turnout

Hypothesis 2a: Control subjects abstain, since the expected benefit of voting is smaller than the cost of voting ($c > B_M(p)$).

Hypothesis 2b: Non-conflicted subjects have the same turnout as control subjects if the additional expressive motive for voting does not outweigh the cost of voting ($c > B_M(p) + \epsilon > B_M(p)$ or $c > B_P(p) + \epsilon$). If there is heterogeneity in the expressive motive, then we will observe non-conflicted subjects who vote and non-conflicted subjects who abstain. However, the overall ϵ is of interest.

Hypothesis 2c: The turnout of non-conflicted subjects is the same as the turnout of conflicted subjects ($\lambda > \hat{\lambda}$). If H1c is rejected, conflicted weak-identity voters abstain ($c > B_D(p)$) or vote according to signal if other motives for voting are present. If H1c fails to be rejected, conflicted strong-identity voters abstain only if the cost of voting is high ($c > B_P(p) + \epsilon$). Otherwise, they vote according to group identity.

Hypotheses about the effect of beliefs

Hypothesis 3a: In the control and in the treatment, belief in a high turnout decreases the probability that the subject will vote. With higher turnout, pivotality is lower, and therefore the instrumental expected benefit from voting is also lower ($B_x(p)$).

Hypothesis 3b: The belief that others will vote for the ingroup candidate at high rates should have a negative effect on the turnout of non-conflicted subjects, while the belief that others will

vote for the outgroup candidate at high rates should have a positive effect on the turnout of non-conflicted subjects. The former is according to the size effect, while the latter is according to the underdog effect. The same should hold true for the conflicted subjects.

Hypothesis 3c:

- For conflicted weak-identity subjects, belief in more votes for the ingroup candidate will increase the probability that the subjects votes for the outgroup candidate, i.e. according to the signal. This is because weak-identity conflicted subjects value the material common good more than their identity and according to the underdog effect, they will be more likely to vote according to signal in order to bring it about. On the other hand, belief in more votes for the outgroup candidate will decrease the probability that the weak-identity conflicted subjects votes for the outgroup candidate, i.e. according to the signal. Since their vote might not be pivotal, it might increase the probability that they vote according to identity.
- For conflicted strong-identity subjects, belief in more votes for the ingroup candidate will decrease the probability that the subjects votes for the ingroup candidate, i.e. according to the identity. This is according to the size effect, because they are less likely to be pivotal and therefore expect a lower benefit from voting their identity. On the other hand, belief in more votes for the outgroup candidate will increase the probability that the strong-identity conflicted subjects vote for the ingroup candidate, i.e. according to the identity. This is according to the underdog effect, since they want to bring about their desired alternative.

Both types of conflicted voters might be more likely to vote identity, when they believe in high rates of voting for the outgroup candidate, but for different reasons: the weak-identity ones because they will be less likely to be pivotal and the strong-identity ones because they want their candidate to win. The former corresponds to the size effect, while the latter to the underdog effect. The reverse holds true for the belief in voters for the ingroup candidate.

Hypotheses about minority and majority voting

Hypothesis 4a: Being in a majority, should decrease turnout of both conflicted and non-conflicted subjects, since the expected instrumental benefit from voting is lower with lower pivotality. Being in a minority should increase turnout of all subjects according to the underdog effect.

Hypothesis 4b: The closer an election is believed to be, the higher the turnout. This is equivalent to the competition effect.

Hypothesis 4c: If non-conflicted subjects who are in minority believe that others will vote for

their ingroup candidate at high rates, then their turnout should be low. If non-conflicted subjects who are in minority believe that others will vote for their outgroup candidate at high rates, then their turnout should be high. The former is the size effect, while the latter is the underdog effect. The same should hold for the turnout of conflicted subjects.

Hypothesis 4d:

- For conflicted weak-identity subjects being in a minority could increase voting according to signal, if they want to improve the outcome and this should be moderated by beliefs. This effect will be stronger if they believe others will vote for the outgroup candidate at high rate. This is equivalent to the underdog effect. If they believe that others will vote for the ingroup candidate at a high rate, they should be less likely to vote for the signal, due to lower pivotality. This is equivalent to the size effect.
- For conflicted strong-identity subjects being in a minority could increase voting according to group identity. This is equivalent to the underdog effect. This effect should be moderated by beliefs. If they believe that others will vote for the ingroup candidate at a high rate, they should be less likely to vote for the group identity, due to lower pivotality. This is equivalent to the size effect. If they believe that others will vote for the outgroup candidate at a high rate, they should be more likely to vote for their identity, since they want their ingroup candidate to win. This is equivalent to the underdog effect.

The effects go in opposite direction and we cannot distinguish a priori between weak-identity and strong-identity subjects. However, we can establish which type of conflicted voter dominates in the sample and the observed effect should be in line with their behavior.

Hypothesis about efficiency

Because it not possible to put a monetary value on the instrumental group identity utility and the expressive identity utility, in the following I compare efficiency in the control with efficiency in the treatment without taking into account the monetary value of these two additional motives.

Hypothesis 5a: Expected efficiency in the control depends on the cost of voting. Since it this design, the cost of voting is so high that the only equilibrium is the one in which everybody abstains, expected efficiency should be no better than $Q(l) = 0.5$.

Hypothesis 5b: Efficiency in the control should be equal to efficiency in the treatment if the expressive identity motive (ϵ) is low. Efficiency in the treatment should increase if the expressive identity motive (ϵ) is high, but only if the weight placed on identity is low ($\lambda < \hat{\lambda}$). If the weight

placed on identity is high then the efficiency should be the same as in the control.

Hypothesis 5c: If there is only one group identity type in the electorate, then either 40% of the voters are conflicted and 60% are non-conflicted, or the other way around, depending on which candidate is the right one.

- If the expressive motive for voting is low, then efficiency should be the same as in the control, namely $Q(l) = Q(0) = 0.5$.
- If the expressive motive if high and the weight placed on identity is high, then the candidate that matches the group identity type of the population always wins. In the former case, the right candidate always wins $Q(l) = Q(9) = 0.73$, while in the latter the wrong candidate always wins $Q(l) = Q(-9) = 0.23$.
- If the expressive motive if high and the weight placed on identity is low, then only non-conflicted subjects vote. Expected efficiency is higher in the former, $Q(l) = Q(6) = 0.68$ than in the latter case $Q(l) = Q(-4) = 0.35$.

If the proportion of group identity types is equal in the electorate, then conflicted voters can range from 90% to 10%, while non-conflicted voters can range from 10% to 90%.

- If the expressive motive for voting is low, then efficiency should be the same as in the control $Q(l) = Q(0) = 0.5$.
- If the expressive motive if high and the weight placed on identity is high, then everybody votes according to group identity. Since, the proportion of the two types is equal, efficiency is no better than in the control $Q(l) = Q(0) = 0.5$.
- If the expressive motive if high and the weight placed on identity is low, then only non-conflicted subjects vote. Therefore, the right candidate is expected to win, because an additional 10% of non-conflicted voters receive the correct signal $Q(l) = Q(1) = 0.6$.

Hypothesis 5d: The counterfactual elections in which the behavior of non-conflicted subjects is kept constant, while all conflicted subjects who turned out vote for their signal results in improvement of some of the election outcomes.

4 Results

In order to test whether the manipulation has had any effect, I test whether the 'inclusion of other in the self' measure (Gächter et al., 2015) at the end of the experiment is different from 1. A binomial test indicated that the proportion of subjects who identified with their group identity to some degree .85 was higher than the expected .50, $p < .001$ (1-sided). However, because the measure was given at the end of the experiment, it is not a clean measure of identification with

the ingroup, since it is possible that the voting game has also affected group identity.

Another test for the effectiveness of the manipulation is checking whether subjects remember at the end of the experiment to which group they were assigned. A binomial test indicated that the proportion of subjects who remembered to which group identity they belonged during the experiment .94 was higher than the expected .50, $p < .001$ (1-sided). The question related to the memory for own group identity was not incentivized. Therefore, this measure can be interpreted as a lower bound on the recall of the group identity. These two tests suggest that inducing group identity was successful.

Results on voting behavior

Table 3 summarizes the results and predictions for the voting behavior in the control and in the treatment for the periods 1 and 2 without feedback on the proportion of group types in the population. The number of conflicted and non-conflicted subjects varies in each period, due to the different signals each receives in every period. For instance, a subject who had been non-conflicted in the first period, because her group identity and the signal were congruent could become a conflicted subject in the second period due to a mismatch between her group identity and a new signal that informs her the outgroup candidate has a higher chance of being the 'right' candidate. The table takes into account only the subjects who chose to vote.

Table 3: Voting behavior

	Vote signal (period 1)		Vote identity (period 1)		Vote signal (period 2)		Vote identity (period 2)		Vote signal (both periods)		Vote identity (both periods)	
Control voters	8/9	(89%)	-		8/9	(89%)	-		16/18	(89%)	-	
Prediction	9/9	(100%)	-		9/9	(100%)	-		18/18	(100%)	-	
Treatment voters	17/20	(85%)	3/20	(15%)	15/18	(83%)	3/18	(17%)	32/38	(84%)	6/38	(16%)
Non-conflicted voters	12/12	(100%)	12/12		11/11	(100%)	11/11		23/23	(100%)	23/23	
Conflicted voters	5/8	(62%)	3/8	(38%)	4/7	(57%)	3/7	(43%)	9/15	(60%)	6/15	(40%)
Prediction if $\lambda < \hat{\lambda}$	20/20	(100%)	0/20	(0%)	18/18	(100%)	0/18	(0%)	38/38	(100%)	0/38	(0%)
Prediction if $\lambda > \hat{\lambda}$	0/20	(0%)	20/20	(100%)	0/18	(0%)	18/18	(100%)	0/38	(0%)	38/38	(100%)

In the control, in both periods, all but one subject vote according to their signal. The null hypothesis that subjects vote according to their signal, tested against a degenerate equilibrium prediction, cannot be rejected (McNemar's test, $\chi^2(1) = 1, p = .317$ for period 1, $\chi^2(1) = 1, p = .317$ for period 2).

Control subjects use information wisely, increasing with every vote the chances that the right

candidate is elected. Only one subject consistently voted against the signal. The signal is noisy, so it might be incorrect with a probability of 40%. However, voting against the signal risks the possibility of cancelling an informed vote, and thus decreases overall expected efficiency of the vote. According to the Condorcet Jury model, because the signal is informative and uncorrelated among participants, each vote according to it increases the chances of reaching the right decision. Mechtenberg and Tyran (2016) also find that most subjects use their information responsibly, with 95% and 97% voting according to their signal. Although the information the voters receive is imperfect, they choose to follow it and therefore improve the expected efficiency of the vote.

Result 1a: Control subjects vote rationally.

Conflicted voters vote more often according to signal than according to group identity, 62 % compared to 38 % in period 1, 57 % compared to 43 % in period 2. This amounts to 15% of voters in period 1 and 17% of voters in period 2, and therefore 16% for both periods, who vote according to their group identity. Or in the total sample of subjects, 8% in each period. Testing voting behavior against a degenerate distribution of voting only according to signal, the null hypothesis of conflicted subjects voting only according to signal cannot be rejected (McNemar's test, $\chi^2(1) = 3, p = .250$ for period 1, $\chi^2(1) = 3, p = .250$ for period 1). When one considers for both periods solely the voters that were only once conflicted, 67% (4/6 conflicted voters) voted according to identity (McNemar's test, $\chi^2(1) = 4, p = .125$)

This suggests that the relevant case to consider is the one in which subjects place a lower weight on their private preference than the on the instrumental preference ($\lambda < \hat{\lambda}$). Conflicted subjects do tend to vote identity, but at lower rates than voting their signal. The data suggest that some conflicted subjects display ingroup bias, voting against their material self-interest and the group's material interest, just to show support for the ingroup candidate. This not only hurts them in material terms, but the whole group, including the ingroup by risking cancelling and informed vote.

Result 1b: Conflicted subjects tend to vote according to signal rather than according to group identity.

Since non-conflicted subjects who turnout vote according to signal and group identity, H2c cannot be rejected. Non-conflicted subjects have an additional reason to vote for the signal compared to control subjects, due to their group identity.

Result 1c: Non-conflicted subjects vote rationally.

This analysis shed light on the voting behavior of control and treatment voters for the two periods

when they were not informed about the composition of their voting groups. Result 1a confirms the hypothesis that voters choose to use their information rationally, increasing with every vote the chances that the 'right' candidate is elected. According to Result 1c, the same is true for non-conflicted subjects. Result 1b shows that although conflicted subjects tend to vote more often according to signal, a substantial amount chooses to vote for the ingroup candidate, 60% on average of conflicted voters vote according to their signal, while 40% vote according to their group identity. When voters that were only once conflicted in the two periods are considered, 67% voted according to their identity. In total, 16% of the total number of voters choose to vote according to group identity when their signal tells them otherwise.

Results on turnout

Table 4 summarizes the results and predictions for the turnout in the control and in the treatment for the periods 1 and 2 without feedback on the proportion of group types in the electorate.

Table 4: Turnout

	Vote (period 1)		Vote (period 2)		Vote (both periods)	
Control voters	9/18	(50%)	9/18	(50%)	18/36	(50%)
Prediction	0/18	(0%)	0/18	(0%)	0/36	(0%)
Treatment voters	20/36	(56%)	18/36	(50%)	38/72	(53%)
Non-conflicted voters	12/16	(75%)	11/16	(69%)	23/32	(72%)
Conflicted voters	8/20	(40%)	7/20	(35%)	15/40	(37%)
Prediction if ϵ low	0/36	(0%)	0/36	(0%)	0/72	(0%)
Prediction if ϵ high and $\lambda < \hat{\lambda}$	16/36	(44%)	16/36	(44%)	32/72	(44%)
Prediction if ϵ high and $\lambda > \hat{\lambda}$	36/36	(100%)	36/36	(100%)	72/72	(100%)

In the control, in both periods, 50 % of the subjects choose to vote. Testing against a degenerate equilibrium prediction of no voting, the difference is strongly statistically significant for each period (McNemar's test, $\chi^2(1) = 9, p = .003$ for period 1, $\chi^2(1) = 9, p = .003$ for period 2). Therefore, H1a can be rejected. Although the cost of voting was set as high as 2.5 Euros and outweighs the maximum possible expected benefit from voting by 1.5 Euros, half of the subjects still choose to vote.

The high turnout observed suggests that voters take into consideration other type of benefits from voting besides the purely monetary ones. This high turnout is also observed in other experiments and is also consistent with empirical data for elections. For instance, Mechtenberg and Tyran (2016) find that voters pay a cost to acquire information at higher levels than predicted, which in this design is equivalent to paying a cost to vote. Reasons for this could include voting out of a

sense of duty which can be regarded as an expressive motive, other-regarding preferences, experimenter demand effects or confusion. Altruistic preferences could play a role, since an additional vote, although costly, increases the probability that the right candidate will be elected, which would give all group members a higher payoff. The control questions all subjects had to answer at the beginning of the experiment familiarized them with the design and should have decreased their confusion levels. Further research should examine these motives more closely, but in this paper I intend to focus solely on group identity as a determinant of turnout.

Result 2a: Turnout of control subjects is higher than the equilibrium prediction.

Non-conflicted subjects might have an additional expressive motive for voting that is solely due to their desire to support the ingroup candidate. Comparing the turnout of control and non-conflicted subjects, the latter vote at higher rates, 75 % compared to 50 % in period 1, and 69 % compared to 50 % in period 2. The difference is however not statistically significant (one-sided Fischer's exact test, $p = .126$ for period 1, $p = .224$ for period 2).

Although non-conflicted voters tend to vote at higher rates than controls, the difference is not statistically significant. Therefore, I can conclude that the purely identity expressive motive for voting is not strong enough to produce a significant change in turnout. Hypothesis 1b fails to be rejected. Comparison with the control subjects, where other expressive motive for voting are present ensures that I can identify the effect of the purely identity expressive motive for voting. However, other-regarding preferences pose a problem for this identification. This is due to the possible interaction of other-regarding preferences and group identity in the treatment. For instance, non-conflicted subjects might want to improve the outcome only for their ingroup. However, non-conflicted subjects could also wish to hurt the outgroup and therefore, vote at lower rates. These two kinds of preferences might cancel each other, or one might come to dominate. The literature in social psychology and experimental economics reports that the identity bias is due to ingroup favoritism rather than outgroup hostility (Balliet et al., 2014; Lane, 2016). This means, we could expect higher turnout of non-conflicted subjects. However, the literature also reports that subjects choose the action that maximizes group differences instead of the absolute benefit of the ingroup (Tajfel et al., 1971). Therefore, one could also expect these preferences to cancel each other out, since, in this design, voting for the signal brings about the same benefit for the ingroup member as for the outgroup member.

Result 2b: Non-conflicted subjects have the same turnout as control subjects. There is no evidence for the expressive identity motive for voting.

The turnout of non-conflicted subjects appears to be higher than the turnout of conflicted subjects,

with 75 % versus 40 % subjects voting in period 1, and 69 % versus 35 % in period 2. Considering the average for both periods, 72% of non-conflicted subjects tunrnout versus 37% of conflicted subjects. The difference is statistically significant for each period (one-sided Fischer's exact test, $p = .038$ for period 1, $p = .046$ for period 2).

There seems to a significant difference in turnout between the two types of voters consistent with the case in which subjects place a lower weight on their group identity ($\lambda < \hat{\lambda}$). Non-conflicted subjects vote at higher rates than conflicted subjects due to their higher expected benefit from voting. Therefore, H1c can be rejected.

Result 2c: Non-conflicted subjects have a higher turnout than conflicted subjects.

This analysis has investigated the turnout decision of subjects. Result 2a shows that the turnout of control subjects is much higher than expected based on calculations of expected monetary benefit from voting. This points to other non-monetary reasons for voting. Possible explanations are expressive motives such as voting out of a sense of duty, altruistic preferences, experimenter demand effects or confusion. Result 2b shows that although the turnout of non-conflicted subjects is higher than the turnout of control subjects, this difference is not statistically significant. Therefore, the postulated expressive motive due to inducing group identity does not influence turnout. According to Result 3c, non-conflicted subjects vote at higher rates than conflicted subjects suggesting that conflicted subjects place a non-negligible weight on their group identity, but that this preference is not strong enough to make them turn out in support of the ingroup candidate.

Results on beliefs

Figure 1 shows the percentage of participants holding different beliefs in how many others in their electorate will choose to pay the cost to vote. Overall, 25% of subjects believe that 4 or less than 4 other electorate members will vote (44% for the control, 24% for the treatment in periods 1 and 2, 25% for the treatment in periods 3 to 7 believe than less than 5 other electorate members will vote).

Table 5 shows the results of the logistic regressions on turnout for the control and the treatment using clustered standard errors at the individual level. Columns (1) and (4) of Table 5 use only the first period observations. The models for the control condition without controls is insignificant (columns (1) $\chi^2(1) = .05, p = .822$ and (2) $\chi^2(1) = .18, p = .672$ of Table 5), while the model for the treatment with controls is insignificant (column (7) $\chi^2(20) = 24.98, p = .125$ of Table 5). The included controls were some of the answers to the questionnaire at the end (Appendix). Some of the questions included contained socio-demographic information: age, gender, and number of siblings. The questions were taken from the World-Value Survey on attitudes on democracy and

reciprocity: *In a democracy, there is a duty to participate in elections. In a democracy, there is a duty to cast an informed vote in an election. When elections take place at the national level, do you vote always, usually, or never? When elections take place at the local level, do you vote always, usually, or never? In a democracy, there is a duty to vote for the most qualified candidate in an election. How would you rate your willingness to do a favor for someone whom you have just met and who is doing you a favor?* There were also questions related to group identity similar to those used by Chen and Li (2009): *Communication with my group members helped me solve the two extra painting questions (in Part 1 of the experiment). I felt connected with the same group members during the experiment. When choosing between candidates, I felt less connected with the candidate from the other group. I hoped the candidate of my type would win.*. The same controls were used throughout the statistical analysis (Table 6 and 7).

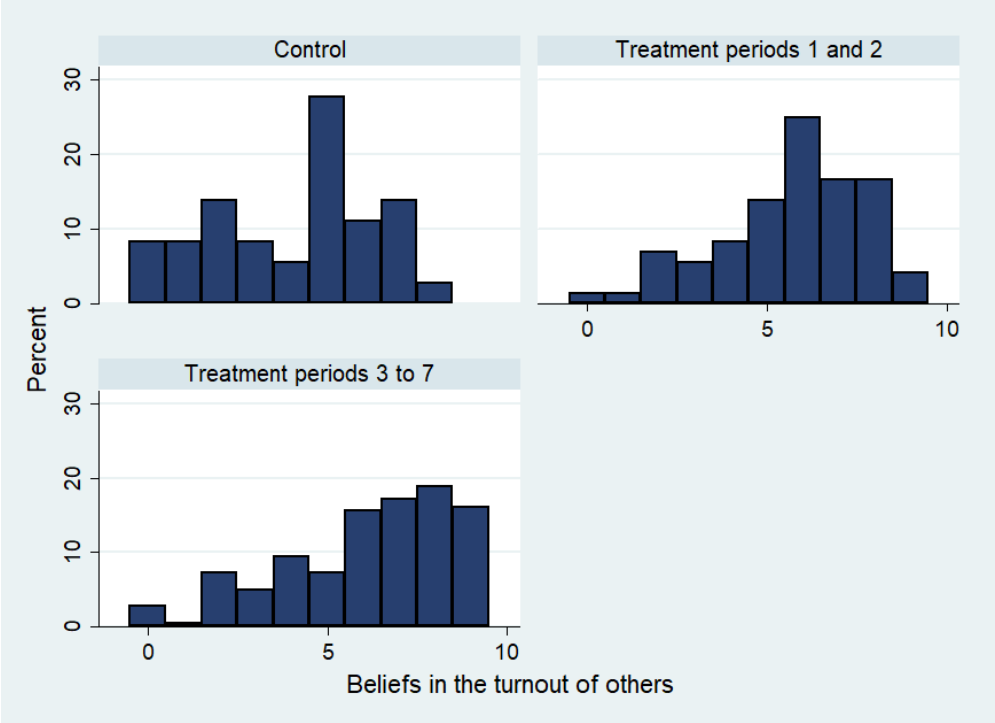

Figure 1: Percent of paticipants holding a certain belief in the turnout of others

Belief in turnout variable is used to evaluate the effect of the belief in how many others in the electorate vote on the subject's own turnout decision. In the control, the coefficient of the logistic regression of belief in the turnout of others on actual turnout is insignificant (columns (1), (2), (3) of Table 5). However, it becomes highly significant in the treatment and is robust to different specifications, except for the case with controls (columns (4), (5), (6), (7) of Table 5). Nevertheless, contrary to a rational expectation, it has a positive sign in both control and treatment, meaning that an individual is more likely to vote when she believes that others will also vote. For instance, in column (4) of Table 5, the coefficient of the variable belief turnout is $\hat{\beta} = .875$, the odds ratio is 2.42 ($s.e. = 1.672, p = .014, ci = [1.194, 4.812]$). For a unit increase in belief turnout, the odds of voting increase by a factor of 2.4. Therefore, H3a can be rejected for the treatment.

Subjects' turnout in the treatment is influenced by their belief in the turnout of others. The more people they believe will vote, the higher the likelihood that they will also vote. This is contrary to the rational prediction that subjects should be less likely to vote in such situations, due to decreased expected benefit from voting brought about by lower pivotality. This result is inconsistent with the size effect observed in the experiments of Levine and Palfrey (2007).

Figure 2 shows the percent of those who turnout for each level of belief in the turnout of others. The observed result could be consistent with conditional cooperation if subjects decide to vote for their signal. This is also observed in the experiment of (Mechtenberg & Tyran, 2016), where voters are more willing to acquire information when they believe other are also doing the same. However, this explanation might not apply to the behavior of conflicted subjects who choose to vote for their identity. Another possible explanation could be a type of conformity to what is perceived as the social norm of voting.

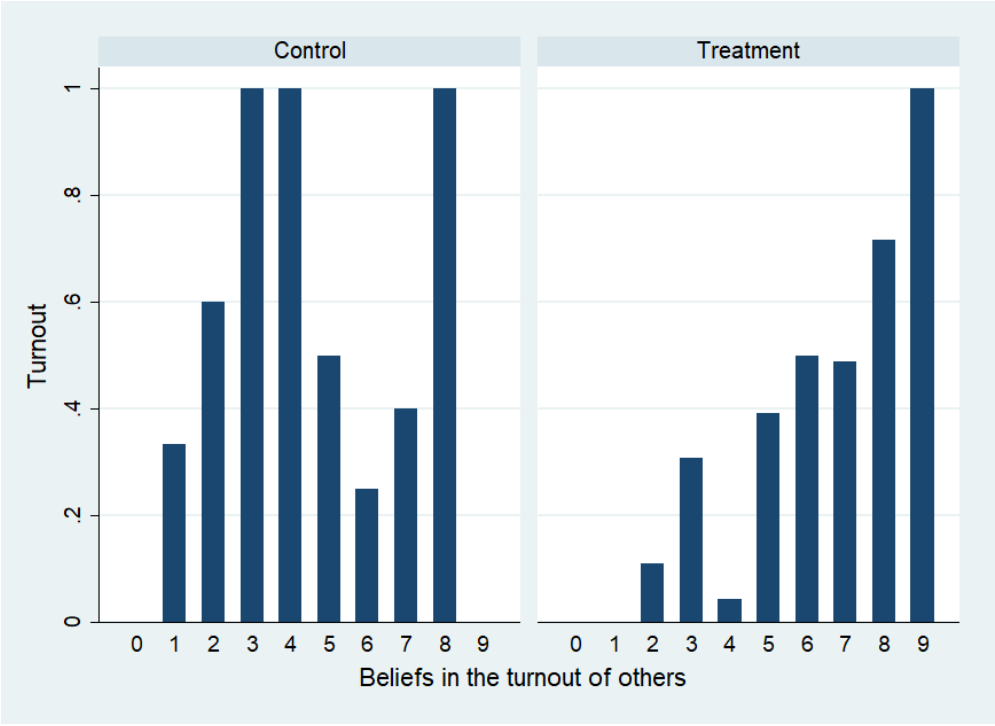

Figure 2: Turnout based on beliefs in the turnout of others

Result 3a: There is evidence against the size effect on turnout in the treatment based on beliefs in the turnout of others. The belief that others vote at a high rate increases one's own turnout.

The belief ingroup voters variable refers to how many participants the subject thinks voted for his or her ingroup candidate. The same applies to belief outgroup voters variable, but now it refers to the subject's outgroup candidate. The coefficient of *belief ingroup voters* is insignificant for periods

1 and 2 for different specifications, except for the the regression using only period 1 observations, with no controls and no interaction terms (column (4) of Table 5). The sign is positive, which runs contrary to the size effect. However, for the regressions on turnout using the periods with feedback, the coefficients of *belief ingroup voters* and *belief outgroup voters* become significant (columns (2), (3), (4) of Table 6). The model using only the first period observations is insignificant (column (1) $\chi^2(7) = 9.7, p = .206$ of Table 6). Both coefficients are positive. This was expected for the coefficient of belief outgroup voters and is consistent with the underdog effect hypothesis, namely that voters are more likely to vote when they believe they are in minority. However, turnout is not negatively affected by their belief in lower pivotality, due to increase number of ingroup voters, which runs contrary to the size effect hypothesis.

The coefficients of the interaction terms between the dummy of whether a voter is non-conflicted and the belief in the number of votes for the outgroup candidate or number of ingroup voters are insignificant when considering only the first 2 periods (columns (6) and (7) of Table 5) that do not include feedback on the distribution of types of voters in the electorate. The same holds true also for the periods with feedback (Table 6), except for the regression including a variety of interaction terms and controls (column (4) of Table 6), where the coefficient of the interaction term between non-conflicted voter and belief in outgroup voters is weakly significant and negative. There does not appear to be any difference in how conflicted and non-conflicted change their turnout in response to beliefs.

Result 3b: There is evidence for the underdog effect, but evidence against the size effect on turnout when beliefs in how others vote are considered. Both the belief in a high number of ingroup and outgroup voters increases one's own turnout.

To analyze the determinants of identity voting, I perform logistic regressions using only the conflicted subjects, first with actual voting in column (1) and then also including also the hypothetical voting in columns (2), (3), and (4) for the periods with feedback. The hypothetical voting question was included only in the second treatment session. It consisted of a question asking subjects who abstained for which candidate they would have voted. Contrary to expectation, the coefficient of the *belief in ingroup voters* is positive, while the coefficient for the *belief outgroup voters* is negative (columns (1), (2), (3), (4) of Table 7). This speaks against both the underdog effect and the size effect hypotheses.

Conflicted subjects are less likely to vote their same identity candidate if they believe the number of outgroup voters is high. This is consistent with the interpretation that when conflicted voters believe the outgroup candidate is the right one as evidenced by their belief in the high number of outgroup voters, they are also more likely to vote for him or her. A second interpretation is that the subjects are following the perceived ingroup norm of voting according to signal. For the

conflicted subjects, outgroup voters represent the voters that vote according to signal. The former interpretation is supported by the positive sign of the coefficient for belief ingroup voters, but the latter interpretation is not. Therefore, conflicted subjects appear to guide their voting decisions according to their beliefs about the right candidate as evidenced by their beliefs in how many others vote for each candidate. However, the beliefs about the voting behavior of others were elicited after the voting stage. Therefore, the observed results might stem from a self-serving bias. Conflicted subjects might have changed their beliefs a posteriori to rationalize their decision.

Result 3c: There is evidence against the size effect and the underdog effect hypothesis on voting according to group identity for conflicted subjects. The belief in high turnout of ingroup voters increases voting according to identity, while the belief in a high turnout of outgroup voters decreases it.

This analysis has sought to extend the results of Levine and Palfrey (2007), by considering beliefs in the number of ingroup and outgroup voters instead of feedback about the group composition. Based on the Result 3a, 3b, and 3c, there is strong evidence against the size effect for both the control and the treatment. Subjects who believe that others turnout at a high rate in the control and that ingroup subjects turnout at a high rate are more not less likely to vote themselves. Possible explanations include conditional cooperation, conformity to social norms of voting. The evidence for the underdog effect based on beliefs is less clear. Result 3b supports it, while Result 3c refutes it. However, Result 3c considers identity voting instead of turnout decisions and the size effect and underdog effect cannot be disentangled. One consistent interpretation is a self-serving bias of conflicted subjects, who might rationalize their voting decision, by changing their beliefs ex post to match what the 'right' choice would have been. The underdog effect based on actual minority instead of beliefs can be investigated using the last 5 periods in which feedback is given about the proportion of group types in the electorate to which I now turn.

Results on minority or majority voting

To study the effects of minority voting, only logistic regressions are performed using only periods 3 to 7 when feedback was given about the proportion of group types in the electorate. In the logistic regression on turnout, the coefficient of the dummy for whether the voter is in *minority* is insignificant (columns (1), (2), (3) of Table 6), except for the specification including interaction terms and controls (column (4) of Table 6). However, contrary to the underdog hypothesis it is negative. A test for the joint effect of minority fails to reject the null hypothesis of no effect of minority on turnout ($\chi^2 = 6.97, p = .138$). The underdog effect does not seem to be present. Therefore, H4a can be rejected.

Result 4a: The underdog effect does not seem to be present. Minority subjects do not tend to vote more often.

The competition variable represents the absolute value of the difference between the proportion of the two groups. The higher the competition coefficient, the more disproportionate the two groups are in the electorate. According to the competition effect, the closer an election is believed to be, the higher the turnout should be. In the logistic regressions on turnout for the treatment for period 3 to 7, the coefficient of the *competition* variable is significant and negative for the specifications including controls (columns (3) and (4) of Table 6). For instance, in column (3) of Table 6, the coefficient of the variable *competition* is $\hat{\beta} = -.178$, the odds ratio is .84 ($s.e. = .084, p = .078, ci = [.686, 1.020]$). For a unit increase in the difference between the two group proportions, the odds of voting decreases by a factor of .084. The mean predicted probability of voting is only .39 if the competition is at the minimum and averaging across the mean values of the other variables, namely when the electorate contains only one identity type. However, it increases to .57 if the competition is at the maximum. Lower competition appears to decrease turnout as predicted. This is in line with the results of Levine and Palfrey (2007).

Result 4b: There is evidence for the presence of the competition effect on turnout. Subjects vote more often when the proportion of group types in the electorate is closer to an equal proportion.

The coefficients of the interaction terms between the two types of voters, minority and beliefs in outgroup and ingroup voters are all insignificant except for the coefficient of the interaction term for *conflicted minority voters and beliefs in number of outgroup voters*, which is positive $\hat{\beta} = 1.185$ (column (4) of Table 6). This is consistent with the underdog effect hypothesis for strong-identity conflicted voters. They are more likely to vote if they are in minority and believe that the number of outgroup voters is high. However, in the sample the behavior of weak-identity subjects should dominate, since they are the majority. The positive sign of the interaction term could also be evidence against the size effect hypothesis, since the number of outgroup voters represents for the conflicted subjects the number of signal votes. If they believe this number is high, then their pivotality is lower and therefore also their expected benefit from voting according to signal. Contrary to this size effect hypothesis, their turnout is actually higher in this case. The two effects are hard to disentangle, since it is not possible to distinguish a priori strong-identity from weak-identity conflicted subjects.

Result 4c: Minority conflicted subjects who believe the number of outgroup voters is high are more likely to vote.

Taking only conflicted voters into consideration, the coefficient of minority (columns (1), (2), (3),

(4) of Table 7) and the coefficient for the interaction term between minority and the belief in number of outgroup voters and ingroup voters are all insignificant (column (4) of Table 7).

Result 4d: Being in minority does not influence voting choice of conflicted subjects.

This analysis has sough to replicate the results of Levine and Palfrey (2007) for minority versus majority turnout decisions. Result 4b supports their competition effect. Subjects tend to turn out more when the group types are more equal in the electorate indicating higher competition. According to Result 4a and Result 4d, being in minority does not seem to increase one's own turnout, which speaks against the underdog effect hypothesis. Result 4c seems to support this hypothesis when beliefs in the number of outgroup voters are also considered. However, the size effect and the underdog effect are again hard to disentangle. Given the results on minority voting and on beliefs, I conclude that there no strong evidence for the presence of the underdog effect.

Results on efficiency

Table 8 presents the expected efficiency for the control and for the treatment only for the first 2 periods without feedback. Because for the treatment, I cannot attach a monetary value to either the expressive identity motive or the instrumental identity motive, I calculate expected efficiency as if these two types of preferences are not relevant. Although I choose to ignore the payoffs subjects might derive from voting according to identity, it is useful to consider expected efficiency only in terms of monetary value, since this represents the economic impact that an election has on citizens.

Result 5a: The average expected efficiency for the control is $Q(l) = 0.64$, higher than predicted $Q(l) = 0.5$ and is due to the larger than expected turnout.

In the control, expected efficiency loss due to voting against signal is 4%, while the average expected efficiency loss for the treatment for the first 2 periods is 5%. In the control 11% of the votes are against the signal, while in the treatment, 17% of the votes are against the signal. In the control 3 out of 4 elections were won by the 'right' candidate, while in the treatment only 4 out of 8 elections were won by the 'right' candidate. Unfortunately, I cannot conclude given the small number of observations if there might be a significant effect on efficiency in the treatment compared to control. One could carry out Monte Carlos simulations to simulate the impact of expressive voting on outcomes given the sample parameters. However, the difference seems to be small. The small difference is also due to the fact that the signal is only 60% of the time correct and therefore very noisy. In the control, the decrease in expected efficiency is also due to only one subject voting against the signal.

Result 5b: Average expected efficiency loss due to voting against signal is 4% for the control and 5% for the treatment for only the first 2 periods corresponding to a 11% and 17% drop in votes for signal. The 'right' candidate was elected in 3/4 cases in the control and 4/8 cases in the treatment.

Table 9 presents the efficiency for the treatment with feedback. For the periods 3 to 7 with feedback on group composition, on average 3,5 subjects vote according to signal, while 0,8 vote according to identity. This results in a cancellation of almost one vote for signal, leading to on average 2,75 votes for signal in a group of 9 voters or a 18% decrease in votes for signal. The average difference in success probability between the actual voting and the ideal voting in which everybody voted for their signal is about 4%. In monetary terms, it is equivalent to 3,42 Euros from an average of net efficiency of 45,33 Euros.

Looking only at the first period when feedback was introduced, the efficiency loss is on average 6%, not very different from the control or treatment without feedback. Efficiency loss is highest when the proportion of types in the group is almost equal and lowest when only one type is in a group. However, these calculations do not take into account the fact that in each period a different state of the world is realized. For instance, for the the case when only one group type is present in the electorate, either the ingroup candidate or the outgroup candidate might be the 'right' candidate. In the former case expected efficiency is highest, while in the latter expected efficiency is lowest. Table 10 shows the expected efficiency of minority voting for each electorate group based on the actual number of non-conflicted and conflicted subjects. All these calculations are based on expected efficiency. In the actual election, a 18% decrease in votes for signal could tip the election in favor of the 'wrong' candidate, yielding every voter a payoff of 0, instead of 10 Euros. In total 8 out of 20 elections were won by the 'right' candidate.

Result 5c: Average overall efficiency loss for the treatment with feedback is 8%. For the proportion of group types 4-5, efficiency loss seems to be the highest at 17%, while for the 0-9 type proportion efficiency loss is the smallest at 2%. The 'right' candidate was elected in 8/20 cases in the treatment with feedback.

If one considers the counterfactual election in which the voting behavior of non-conflicted subjects is unchanged, but all the conflicted subjects who turned out vote according to their signal, the outcome is changed in 2 cases for the worse, and in 4 cases for the better. The elections that resulted in ties were excluded from the calculation (7 out of 28). In the treatment without knowledge of group composition, 2 election outcomes are changed for the better, and 1 for the worst, resulting in an improvement of 20%, while in the treatment with knowledge of group composition, 2 are changed for the better and 1 is changed for the worse, resulting in an improvement of 6%. Outcomes are changed for the worse due to the noise inherent in the signal. Overall, if conflicted subjects who turned out to vote did so according to their signal instead of group identity, it would

have improved the outcome of 2 out of 21 elections or 9,5% of the cases.

Result 5d: If all conflicted subjects who turned out would have voted according to the signal, it would have resulted in an average improvement of 20% (1 out of 5 elections) of the election outcomes for the treatment without feedback on group composition and 6% (1 out of 16) improvement for the treatment with feedback.

Limitations and future considerations

One of the limitations of the study is the lack of a balanced design between the control and the treatment. In the control no group identity inducement was used, and only 2 voting stages were played, while in the treatment a total of 7 voting stages were played. The lack of a group identity inducement stage in the control, even though not relevant for the later stages, might not rendered the control directly comparable to the treatment.

It is not possible to distinguish a priori between strong-identity and weak-identity subjects. In this experiment, that distinction is made based on each subject's voting decision. It would be possible to approximate in which category each subject falls using the 'inclusion in the self' measure. However, this measure should be given at the beginning of the voting game to ensure that voting decisions have not influenced it. Another way is to ask the hypothetical voting question. The hypothetical voting decision was only introduced in the second session of the treatment. Therefore, data on how participants who abstained might have voted is unavailable. This question is important for measuring the underlying preferences of each subject, especially conflicted subjects. Another way to find out the true preferences of subjects is to lower the cost of voting. The question that tested whether a subject remembered his or her group identity at the end of the experiment was not incentivized. Unmotivated subjects might therefore not have paid enough attention to it. The 'inclusion in the self' measure was presented at the end of the voting game. Therefore it is not a clean measure of group identity strength, since the voting stage might have influenced it.

In order to study whether the expressive identity motive is indeed an important factor in voting decisions, a new treatment that varies pivotality should be introduced. This can either be through varying the electorate size or introducing different voting rules instead of majority voting. This would enable one to test the low cost theory of voting (Tyran & Wagner, 2016).

5 Conclusion

The main research question that was addressed through this experiment was whether group identity plays a role in turnout and voting decisions. The design was based on the Condorcet Jury model in a situation of voting between candidates. A cost of voting and the possibility of abstention were introduced. For the treatment, the minimal group paradigm and a problem-solving task were used to induce group identities based on artwork preference. Two subjects with different group identities were assigned the role of candidates at the beginning of the experiment and could not make any choices. A second treatment included feedback on the proportion of group types in the electorate before the voting stage.

Non-conflicted subjects were used to examine whether the expressive identity motive plays a role in increasing turnout. One previous study has shown that group identity plays a role in increasing turnout, but in a setup involving competition between groups (Robalo et al., 2017). Most of the expressive voting literature has focused on ethical or redistribution motives (Tyran & Wagner, 2016). This study extends the expressive literature to include group identity. Although the turnout of non-conflicted subjects was higher than in the control (72% vs 50%), the difference was not statistically significant. Therefore, the expressive identity motive does not seem to play a significant role in increasing turnout.

Standard economic theory has difficulty explaining the high turnout observed in elections (Palfrey, 2009). It is assumed that the low pivotality should deter citizens from participating in elections, due to the low expected benefit. As seen in elections, turnout was also high in this experiment in both conditions, despite the high cost of voting. Contrary to the rational prediction, belief in the high turnout of others increased a subjects' own turnout. This is consistent with the interpretation of conditional cooperation on the part of the subjects (Mechtenberg & Tyran, 2016), but also with other expressive motive for voting.

Using the conflicted subjects, it was possible to investigate the tradeoff between voters' material interest tied to the common good and group identity preferences. Previous studies have focused on the tradeoff between the individual self-interest and the ingroup material interest (Klor & Shayo, 2010). One study has examined the effect of group identity on policy choices proposed by candidates (Böhm et al., 2013) and another has examined a sequential game in which elected representatives has actions that could increase their chances for reelection (Landa & Duell, 2015). However, in this study, candidates have no decisions and therefore no reciprocity is possible. By ignoring any possibility of strategic behavior on the part of the candidates, it was possible to test the hypothesis that voters derive some utility from supporting an ingroup candidate, even when they do not gain anything from voting for them. Conflicted subjects choose to vote their signal, but 40% of them vote for the ingroup candidate, thereby decreasing the expected efficiency of the

election. This corresponds on average to 16% of the total votes. Such a decrease could result in the ingroup candidate being elected, regardless of their policy or competence, making everybody worse of in material terms.

Although the average expected efficiency loss due to voting against signal was only 4% in the control and 5% in the treatment without knowledge of group composition and 8% in the treatment with knowledge of group composition, the 'right' candidate won in 3/4 elections in the control, 4/8 elections in the first treatment, and 8/20 in the second treatment. The outcome of 1 in 5 elections would have been improved in the treatment without knowledge of group composition, had the conflicted subjects who voted done so according to signal.

Levine and Palfrey (2007) have investigated minority voting and have found support for the size, underdog and competition effect. This study investigated minority voting, but with group identity. Evidence for the competition effect, but contrary to the size effect was found. Subjects were more likely to vote when the proportion of group identities in the electorate were close to equal than otherwise and were also no less likely to vote when they believed others would vote at a high rate. Being in minority did not influence turnout or voting decisions directly, which indicates the absence of the underdog effect.

These results show that group identity can affect voting decisions, but not turnout. Some voters appear to have a preference from voting for the ingroup candidate, at the expense of their own material self-interest and that of the group. This result holds even when no expectations of reciprocity are possible on the part of the ingroup candidate. It can be expected that, in actual elections, rhetoric drawing attention to the candidate's group identity could influence voters' choices at the expense of everyone's material welfare and with negative implications for the workings of democracy.

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7 Appendix

7.1 Tables

Table 5: Logistic regression on turnout

	Control			Treatment			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Belief turnout	.051	.076	.515	.875***	.820***	.865***	5.265
	(.228)	(.180)	(.320)	(.355)	(.821)	(.271)	(3.424)
Belief ingroup voters				.770*	.203	.227	-.272
				(.453)	(.309)	(.490)	(1.398)
Non-conflicted voter				.514	.820	-1.587	-15.125
				(1.288)	(.821)	(3.924)	(10.365)
Non-conflicted voter*						.285	5.744
Belief ingroup voters						(.705)	(4.806)
Non-conflicted voter*						.605	-2.865
Belief outgroup voters						(.995)	(3.139)
Controls	No	No	Yes	No	No	No	Yes
Constant	-.222	-.311	-4.216	-7.516***	-6.432***	-6.358***	-38.220*
	(1.100)	(.839)	(4.862)	(2.352)	(1.635)	(1.687)	(21.861)
Wald χ^2	.05	.18	29.09	12.77	21.42	22.84	24.98
Prob $<\chi^2$	.822	.672	.001	.005	.001	.001	.125
Pseudo R^2	.002	.005	.554	.477	.398	.402	.817
N	18	36	36	36	72	72	72

Notes: Logistic regressions. Coefficients and clustered standard errors at subject level are reported. The dependent variable is turnout, a dummy for whether a subject voted or not. The independent variables are: Belief turnout - the belief of each subject in how many other subjects in the electorate voted, Belief ingroup voters - the belief of each subject in how many other subjects in the electorate voted for her ingroup candidate, Non-conflicted voter - a dummy variable for whether a subjects is conflicted or not, Controls - answers to the questionnaire questions.
*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table 6: Logistic regressions on turnout for treatment for periods 3-7

	(1)	(2)	(3)	(4)
Belief ingroup voters	.547	.594*	.642***	.626***
	(.589)	(.340)	(.205)	(.209)
Belief outgroup voters	.624	.913***	.896***	.777***
	(.560)	(.326)	(.210)	(.234)
Non-conflicted voter	-.063	2.202	1.910	1.696
	(4.397)	(1.984)	(1.671)	(1.795)
Non-conflicted voter*	.323	-.046	.034	.046
Belief ingroup voters	(.841)	(.286)	(.275)	(.297)
Non-conflicted voter*	-.025	-.464	-.449	-.512*
Belief outgroup voters	(.907)	(.291)	(.287)	(.295)
Minority	1.259	-.162	-.331	-7.429**
	(.907)	(.446)	(.561)	(3.245)
Competition	-.439	-.110	-.178*	-.200**
	(.367)	(.076)	(.101)	(.093)
Non-conflicted voter*Minority				1.467
				(6.368)
Conflicted voter*Minority*				.616
Belief ingroup voters				(.685)
Conflicted voter*Minority*				1.185**
Belief outgroup voters				(.473)
Non-conflicted voter*Minority				.800
Belief ingroup voters				(.787)
Non-conflicted voter*Minority*				1.212
Belief outgroup voters				(.868)
Controls	No	No	Yes	Yes
Constant	-3.651	-4.721**	-8.237***	-8.067***
	(4.203)	(2.414)	(2.767)	(2.747)
Wald χ^2	9.70	23.83	460.85	519.41
Prob $<\chi^2$	.206	.001	.001	.001
Pseudo R^2	.259	.247	.430	.451
N	36	180	180	180

Notes: Logistic regressions. Coefficients and clustered standard errors at subject level are reported. The dependent variable is turnout, a dummy for whether a subject voted or not. The independent variables are: Belief ingroup (outgroup) voters - the belief of each subject in how many other subjects in the electorate voted for her ingroup (outgroup) candidate, Non-conflicted (conflicted) voter - a dummy variable for whether a subjects is non-conflicted (conflicted) or not, Minority - a dummy variable for whether a subject was in minority, Competition - absolute value of the difference between the proportion of group types in the electorate, Controls - answers to the questionnaire questions.

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table 7: Logistic regressions on identity voting for conflicted subjects

	(1)	(2)	(3)	(4)
Voted		-.793	1.784	1.730
		(.852)	(1.203)	(1.186)
Belief ingroup voters	.957**	.679***	1.456***	1.382**
	(.446)	(.268)	(.580)	(.625)
Belief outgroup voters	-.509	-.561**	-1.842*	-1.777**
	(.444)	(.250)	(1.077)	(.910)
Minority	.159	-.139	1.502	1.064
	(1.705)	(1.121)	(2.554)	(3.001)
Competition		.063	.233	.210
		(.112)	(.314)	(.329)
Minority*Belief ingroup voters				-.537
				(2.534)
Minority*Belief outgroup voters				-.172
				(1.097)
Controls	No	No	Yes	Yes
Constant	-2.314	-.542	5.365	6.112
	(1.512)	(.988)	(4.538)	(7.010)
Wald χ^2	6.40	12.50	1017.11	372.69
Prob $<\chi^2$	.094	.028	.001	.001
Pseudo R^2	.413	.303	.625	.627
N	38	62	62	62

Notes: Logistic regressions. Coefficients and clustered standard errors at subject level are reported. The dependent variable is identity voting in line (1), a dummy for whether a conflicted subject voted according to identity or not. The dependent variable is identity voting in lineS (2), (3), (4) a dummy for whether a conflicted subject voted according to identity or not or answered the ingroup candiate for the hypothetical voting question. The independent variables are: Voted - a dummy for whether a conflicted subject voted or not, Belief ingroup (outgroup) voters - the belief of each subject in how many other subjects in the electorate voted for her ingroup (outgroup) candidate, Minority - a dummy variable for whether a subject was in minority, Competition - absolute value of the difference between the proportion of group types in the electorate, Controls - answers to the questionnaire questions.

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table 8: Efficiency for control and treatment periods 1 and 2

			l^+	l^-	l	l^*	$Q(l)$	$Q(l^*)$	GE	GE^*	NE	NE^*	NE loss	% loss	Outcome
$t=1$	Control	G_1	5	1	4	6	0,65	0,68	58,5	61,2	43,5	46,2	2,70	6%	0
		G_2	3	0	3	3	0,65	0,65	58,5	58,5	51	51	-	0%	1
	Treatment	G_3	4	1	3	5	0,65	0,68	58,5	61,2	46	48,7	2,70	6%	1
		G_4	4	0	4	4	0,65	0,65	58,5	58,5	48,5	48,5	-	0%	0
		G_5	5	1	4	6	0,65	0,68	58,5	61,2	43,5	46,2	2,70	6%	1
		G_6	4	1	3	5	0,65	0,68	58,5	61,2	46	48,7	2,70	6%	1
$t=2$	Control	G_1	5	0	5	5	0,68	0,68	61,2	61,2	48,7	48,7	-	0%	1
		G_2	3	1	2	4	0,6	0,65	54	58,5	44	48,5	4,50	10%	1
	Treatment	G_3	5	2	3	7	0,65	0,71	58,5	63,9	41	46,4	5,40	13%	0
		G_4	3	1	2	4	0,6	0,65	54	58,5	44	48,5	4,50	10%	0
		G_5	3	0	3	3	0,65	0,65	58,5	58,5	51	51	-	0%	1
		G_6	4	0	4	4	0,65	0,65	58,5	58,5	48,5	48,5	-	0%	0
Average	Control		4	0,5	3,5	4,5	0,64	0,66	58	59,8	46,8	48,6	1,80	4%	3/4
	Treatment		4	0,75	3,25	4,75	0,64	0,67	57,9	60,2	46,1	48,3	2,25	5%	4/8

Notes: l^+ - number of votes for signal. l^- - net number of votes for against. l - net number of votes for signal. l^* - net number of votes if all votes are for signal. $Q(l)$ - the predicted success probability of the group making the right choice. $Q(l^*)$ - the predicted success probability of the group making the right choice if all votes are for signal. GE - the sum of expected earnings in the group in euros $9 * Q(l) * 10$. GE* - the sum of expected earnings in the group in euros $9 * Q(l^*) * 10$ if all votes are for signal. NE - gross eficiency $-l * c$. NE - gross eficiency $-l^* * c$. NE loss - the NE*-NE. % loss - NE loss/NE. Outcome - 1 if the 'right' candidate won, 0 otherwise.

Table 9: Efficiency for treatment on minority voting

	$\overline{l^+}$	$\overline{l^-}$	$\overline{l}$	$\overline{l^*}$	$\overline{Q(l)}$	$\overline{Q(l^*)}$	$\overline{GE}$	$\overline{GE^*}$	$\overline{NE}$	$\overline{NE^*}$	NE loss	$\overline{\%loss}$
M_4	3,5	1,25	2,25	4,75	0,59	0,66	53,55	59,85	41,67	47,97	6,30	17%
M_3	3,75	0,5	3,25	4,25	0,64	0,66	58,05	59,85	47,42	49,22	1,80	4%
M_2	4,5	1,25	3,25	5,75	0,64	0,69	58,05	61,87	43,67	47,5	3,83	9%
M_1	2,5	0,75	1,75	3,25	0,59	0,64	52,87	57,37	44,75	49,25	4,50	11%
M_0	3,5	0,25	3,25	3,75	0,65	0,66	58,5	59,17	49,12	49,8	0,68	2%
Average	3,55	0,8	2,75	4,35	0,62	0,66	56,20	59,62	45,33	48,75	3,42	8%

Notes: l^+ - number of votes for signal. l^- - net number of votes for against. l - net number of votes for signal. l^* - net number of votes if all votes are for signal. $Q(l)$ - the predicted success probability of the group making the right choice. $Q(l^*)$ - the predicted success probability of the group making the right choice if all votes are for signal. GE - the sum of expected earnings in the group in euros $9 * Q(l) * 10$. GE* - the sum of expected earnings in the group in euros $9 * Q(l^*) * 10$ if all votes are for signal. NE - gross eficiency $-l * c$. NE - gross eficiency $-l^* * c$. NE loss - the NE*-NE. % loss - NE loss/NE.

Table 10: Expected efficiency minority voting disaggregated

	$Q(l)$ ϵ high $\lambda > \hat{\lambda}$	$Q(l)$ ϵ high $\lambda < \hat{\lambda}$	$Q(l)$ ϵ low $\lambda < \hat{\lambda}$	$Q(l)$ c low $\lambda < \hat{\lambda}$	$Q(l)$	Outcome
M_4	0,6	0,4	0,5	0,35	0,6	0
	0,4	0,5	0,5	0,6	0,68	0
	0,4	0,6	0,5	0,68	0,6	1
	0,6	0,5	0,5	0,4	0,5	1
$\overline{M_4}$	0,5	0,5	0,5	0,51	0,6	2/4
M_3	0,35	0,5	0,5	0,65	0,68	1
	0,65	0,65	0,5	0,68	0,6	1
	0,65	0,65	0,5	0,65	0,65	0
	0,35	0,4	0,5	0,4	0,65	0
$\overline{M_3}$	0,5	0,55	0,5	0,6	0,64	2/4
M_2	0,68	0,65	0,5	0,6	0,65	1
	0,32	0,4	0,5	0,6	0,65	0
	0,68	0,68	0,5	0,68	0,6	0
	0,32	0,35	0,5	0,35	0,68	0
$\overline{M_2}$	0,5	0,52	0,5	0,56	0,64	1/4
M_1	0,29	0,35	0,5	0,4	0,65	0
	0,71	0,65	0,5	0,6	0,6	1
	0,71	0,65	0,5	0,6	0,6	1
	0,29	0,4	0,5	0,65	0,5	0
$\overline{M_1}$	0,5	0,51	0,5	0,56	0,59	2/4
M_0	0,27	0,32	0,5	0,4	0,65	0
	0,73	0,68	0,5	0,6	0,65	1
	0,27	0,32	0,5	0,35	0,65	0
	0,73	0,68	0,5	0,6	0,65	0
$\overline{M_0}$	0,5	0,5	0,5	0,49	0,65	1/4

Notes: M_x - number of subjects belonging to the minority group identity type from the total of 9 subjects. l - net number of votes for signal. $Q(l)$ - the predicted success probability of the group making the right choice. ϵ - expressive identity preference. λ - weight placed on group identity preference. Outcome - 1 if the election was won by the 'right' candidate and 0 otherwise.

7.2 Instructions

GENERAL INSTRUCTIONS

Welcome to this economic experiment! The experiment in which you are about to participate is part of a research project on decision-making.

During the experiment, you are not allowed to speak to other participants. Please switch off all communication devices during the experiment.

If you have a question, now or during the experiment, please raise your hand and remain silent and seated. An experimenter will come to you and answer your question in private.

If you read the following instructions carefully, you can earn money. How much money you can earn depends both on your decisions and the decisions of the other participants. It is therefore very important that you read these instructions carefully.

All participants and their decisions will remain anonymous to other participants during the entire experiment. You will neither learn the true identity of your interaction partners nor will others find out about your identity.

At the end of the experiment you will be privately and anonymously paid in cash the amount you earned during the experiment.

In the following we describe to you the general procedure of the experiment: You will be asked to make various decisions and you can earn money for your decisions. How much you can earn will be announced before you have to make your decisions and also depends on other decisions of other participants in the experiment. After the decision-making part of the experiment, a questionnaire concludes the experiment.

DECISION-MAKING PART

In the experiment, you will participate in a number of elections. In an election, there are **9 citizens** who can vote for one of the **2 candidates.** Your role (citizen or candidate) will be determined randomly before the start of the experiment and remains fixed for the entire experiment. You will be informed about your role as soon as the experiment starts.

SUMMARY OF VOTING GAME

There are two candidates who differ in their ability to generate payoffs for the citizens. One of the candidates is better than the other. Each of the two candidate has an equal chance of being the better candidate. Which candidate is the better is determined randomly by the computer at the beginning of the game. **Electing the better candidate leads to a higher payoff for all citizens** than electing the other candidate.

Citizens however **do not know for sure which candidate is better**. Before the election, every **citizen receives a private signal** about which candidate is likely to be better. Each private signal is correct with a probability of 60% and wrong with a probability of 40%. Because the computer determines the signal for each citizen separately, not every citizen may receive the same private signal about which of the two candidates is better.

After receiving her private signal, each **citizen chooses to vote** for one of the candidates, **or chooses to abstain** from voting. Voting incurs a small cost, not voting is costless for the citizen. Candidates make no decisions in the experiment. The **candidate with the most votes wins the election**.

The payoff of every citizen in the voting game is higher if the winner is the better candidate than if the winner is the worse candidate. Candidates receive a higher payoff if they are elected than if they are not elected. Then the game ends.

DETAILED DESCRIPTION OF ONE VOTING GAME

In each voting game, 9 citizens and 2 candidates are randomly matched by the computer to interact in the voting game.

If you are a citizen, **you are one of the 9 citizens** in the voting game who can decide to vote for one of the two candidates or not. If you are a candidate, you are either candidate A or candidate B. Whether candidate A or candidate B is the better candidate is drawn randomly by the computer at the beginning of each game. Each candidate has an equal chance (50%) to be the better candidate.

◆ Information of Citizens

At the beginning of each game, each citizen will receive an individual signal which no one else learns. The signal can take one of the two forms:

- **The signal suggests that candidate A is the better candidate**
- **The signal suggests that candidate B is the better candidate**

Each citizen receives a private signal but it is not necessarily correct**.** The signal is correct with a probability of 60% and incorrect with a probability of 40%. In other words, **the private signal of each citizen is only correct in 60 out of 100 cases, and incorrect in 40 out of 100 cases.**

Because the computer determines the signal for each citizen independently, it is possible that **citizens receive different signals about which candidate is better**. This means that some citizens may for example receive a correct signal and others an incorrect signal about which candidate is better.

◆ Decision of Citizens

After each citizen received her private signal, citizens are asked to choose one of the three options:

- **Vote for Candidate A**
- **Vote for Candidate B**
- **Abstain from voting**

In other words, each citizen can choose to vote for Candidate A, vote for Candidate B or to abstain from the election. To abstain from voting means that neither Candidate A nor Candidate B receives the vote of that citizen.

Note that **Voting is costly for citizens**:

- **A citizen who votes has to pay 2.50 Euros for voting** (independent of which candidate the citizen votes for)
- **A citizen who abstains from voting (i.e. does not vote) pays no costs**

◆ **How the Winner of the Election is Determined**

After all 9 citizens in a voting game made their decisions, the winner of the election is determined. **The candidate, who received more votes is the winner of the election** (majority voting). If there is a tie of votes, one of the two candidates will be picked randomly by the computer. In this case, each candidate is equally likely to win (50%).

Example 1: Assume 7 citizens vote for candidate B, and the other 2 vote for candidate A. Then candidate B wins.
Example 2: Assume 3 citizens vote for candidate A, 1 citizen votes candidate B, and the other 5 abstain from voting. Then candidate A wins.

◆ **Payoff of Citizens**

The payoff for a citizen depends on whether the better candidate wins the election or not, and whether the citizen voted or not.

The payoff of a citizen does not depend on whether the citizen voted for the winning candidate or for the losing candidate, or abstained. All citizens will receive the same payoff generated by the winning candidate minus the cost of voting each citizen has to pay if she voted.

Specifically, each citizen earns 20 Euro – Costs of Voting (2.50 Euro) if the better candidate is elected and each earns 10 Euro – Costs of Voting (2.50 Euro) if the worse candidate is elected.

If the better candidate wins, the winner produces a benefit of 20 Euros for each citizen. **The payoff for every citizen is:**

- **17.50 Euros** if this citizen voted (cost of voting is 2.50)
- **20.00 Euros** if this citizen abstained from voting

If the worse candidate wins, the winner produces a benefit of 10 Euros for each citizen. **The payoff for every citizen is:**

- **7.50 Euros** if this citizen voted (cost of voting is 2.50)
- **10.00 Euros** if this citizen abstained from voting

◆ **Payoff of Candidates**

Note that participants in the role of a candidate make no active decision in the experiment. The payoff of a candidates only depends on whether she wins the election or not. For the candidate, it does not matter whether she is the better candidate or not. That is,

- **The candidate who wins the election receives a payoff of 12 Euros.**
- **The candidate who loses the election receives a payoff of 10 Euros.**

ROUNDS OF VOTING GAME AND PAYMENT

In the experiment, you will interact several in voting games (called rounds).

As a citizen, you will be **randomly matched with 8 other citizens** in every voting game. This means the citizens in your voting game will change from round to round. **As a candidate**, you will be **randomly matched** together with another candidate to a voting game in every round.

At the end of the experiment, **the computer will randomly pick one round you played to determine your payment from the voting game**. Each round has an equal chance to be chosen. **The amount that you earned in the randomly chosen round** (as a citizen or a candidate) **will be paid out** in cash immediately at the end of the experiment together with additional earnings you may receive from other tasks in the experiment.

Before you start with the decision-making part of the experiment, you will be asked to perform a different task. All the instructions for this task will be given to you on screen. After this task is finished, the decision-making part of the experiment will begin.

Once you have read the instructions, please answer the control questions on the next page. The control questions ensure that everyone understands the instructions. Once everyone has correctly answered the control questions, and there are no more questions, we will start with the experiment.

If you have a question, now or during the experiment, please raise your hand and an experimenter will come to you to answer your question.

CONTROL QUESTIONS

Please mark the correct answer.

1. As citizen, I will always interact with the same other citizens each round of the game.
   □ Right. □ Wrong (citizens are matched randomly to a game in each round).

2. At the beginning of each round, each citizen in a voting game receives a private signal. Because signals are drawn for each citizen independently by the computer, *not* every citizen in the voting game will necessarily receive the same signal about which candidate is likely to be the better candidate.
   □ Right. □ Wrong.

3. What is your final payoff if the better candidate is A, the signal says Candidate A, you vote candidate A
   a. All other citizens vote for Candidate B?
      □ 10 € – 2.5 € =7.5€ □ 20 € – 2.5 € = 17.5€
   b. All other citizens abstain?
      □ 10 € – 2.5 € = 7.5€ □ 20 € – 2.5 € = 17.5€

4. What is your final payoff if the better candidate is B, the signal says Candidate A, you vote candidate B and
   a. All other citizens abstain?
      □ 10 € – 2.5 € = 7.5€ □ 20 € – 2.5 € = 17.5€
   b. All other citizens vote for Candidate A?
      □ 10 € – 2.5 € = 7.5€ □ 20 € – 2.5 € = 17.5€

5. As Candidate, what is your final payoff if
   a. You get elected?
      □ 10 € □ 12 €
   b. You don't get elected?
      □ 12 € □ 10 €

6. In how many cases is the signal true on average?
   □ 20 out of 100 cases
   □ 40 out of 100 cases
   □ 60 out of 100 cases
   □ 80 out of 100 cases

Please raise your hand after you have answered all questions.

6

7.3 Questionnaire

For both control and treatment

Q1. What is your age?
Q2. What is your gender?
Q3. How many siblings do you have?
Q4. What do you study?
Q5. In which year did you start your studies?

Q6. In a democracy, there is a duty to participate in elections.
(4-point Likert scale from 1="strongly disagree" to 4="strongly agree")
Q7. In a democracy, there is a duty to cast an informed vote in an election.
(4-point Likert scale from 1="strongly disagree" to 4="strongly agree")
Q8. In a democracy, there is a duty to vote for the most qualified candidate in an election.
(4-point Likert scale from 1="strongly disagree" to 4="strongly agree")
Q9. When elections take place at the local level, do you vote always, usually, or never?
(4-point Likert scale from 1="strongly disagree" to 4="strongly agree")
Q10. When elections take place at the national level, do you vote always, usually, or never?
(4-point Likert scale from 1="strongly disagree" to 4="strongly agree")
Q11. How would you rate your willingness to do a favor for someone whom you have just met and who is doing you a favor?
(10-point Likert scale from 1="very willing" to 10="not at all willing")

Only in the treatment

Q12. To which group did you belong during the experiment? (Klee or Kandinsky)
Q13. Communication with my group members helped me solve the two extra painting questions (in Part 1 of the experiment).
(10-point Likert scale from 1="strongly disagree" to 10="strongly agree")
Q14. I felt connected with the same group members during the experiment.
(10-point Likert scale from 1="strongly disagree" to 10="strongly agree")
Q15. I identified with the same group members.
(10-point Likert scale from 1="strongly disagree" to 10="strongly agree")
Q16. I am glad I belong to this group.
(10-point Likert scale from 1="strongly disagree" to 10="strongly agree")
Q17. I think I actually belong to this group.
(10-point Likert scale from 1="strongly disagree" to 10="strongly agree")
Q18. When choosing between candidates, I felt less connected with the candidate from the other

group.

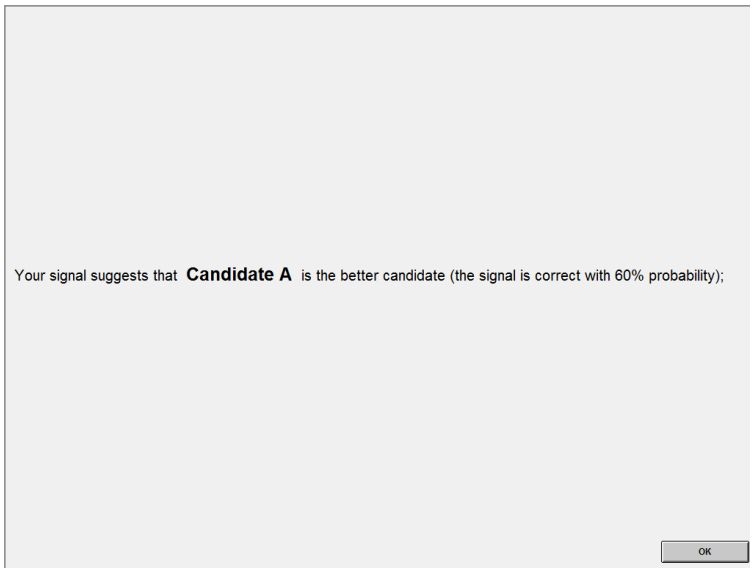
(10-point Likert scale from 1="strongly disagree" to 10="strongly agree")

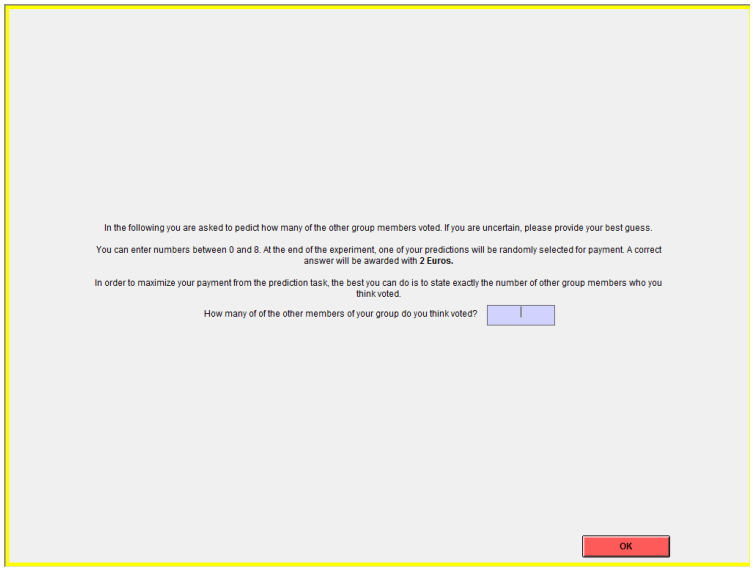
Q19. I hoped the candidate of my type would win.

(10-point Likert scale from 1="strongly disagree" to 10="strongly agree")

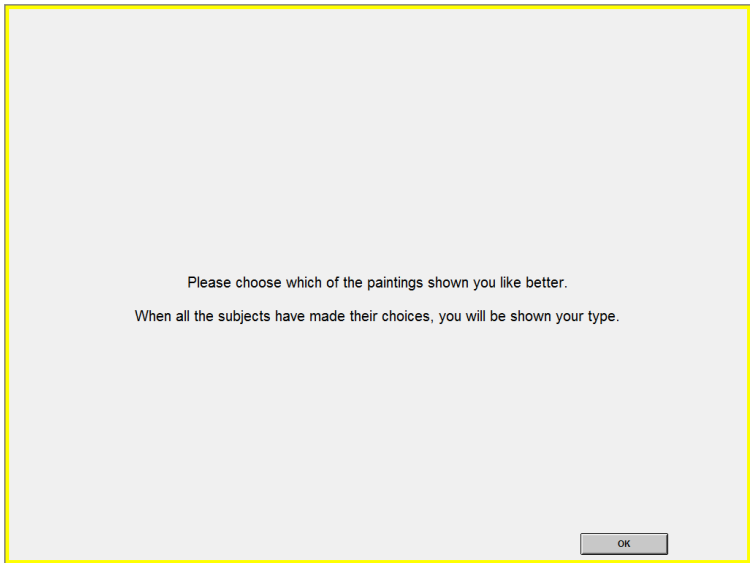
7.4 Screenshots

Screenshots of the control

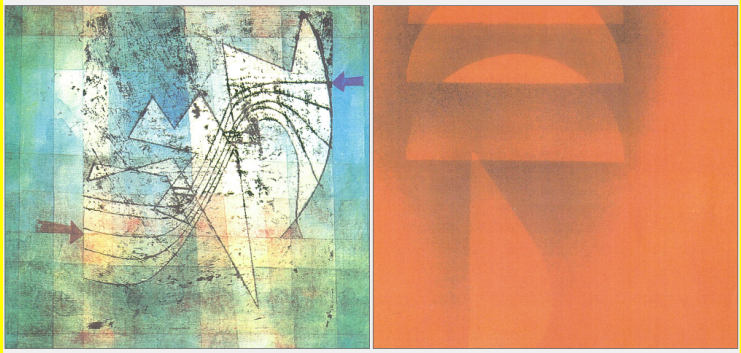




Screenshots of the treatment



Pair 1: Please choose which painting you like better.



I prefer this painting

I prefer this painting

Based on your choices, you prefer the paintings by _Klee_ .
You are part of the_Klee_ Group.

OK

You are in the Klee Group

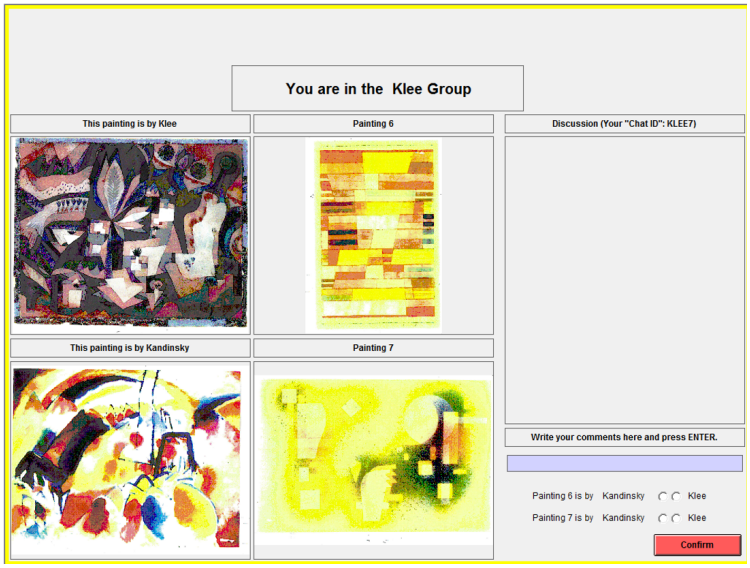
You will now see two additional pictures, pictures no. 6 and no. 7. These will appear in the center of the screen. Please choose which painter you think painted the respective pictures. For each correct answer you get 1 Euro.

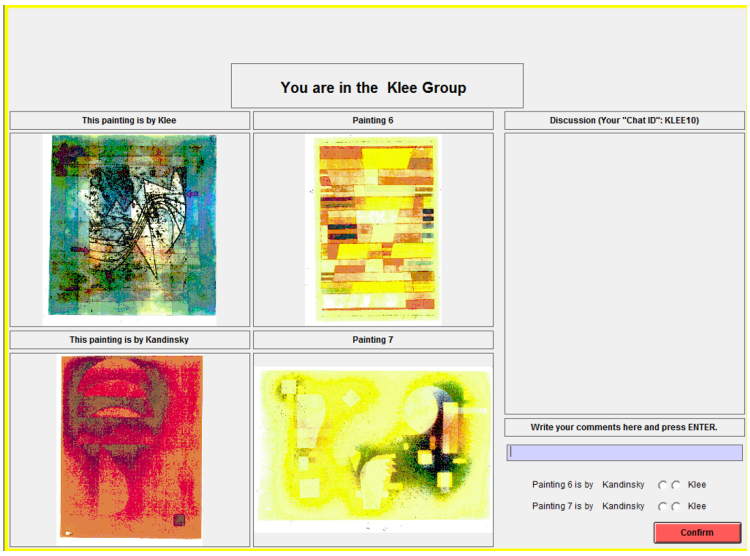
To help you make your choice, the paintings on the left-hand side of the screen will be labeled with their artist's name . You have three minutes to make your choice.

While Images Nos. 6 and 7 are the same for all experiment participants, other participants may see different labeled paintings.

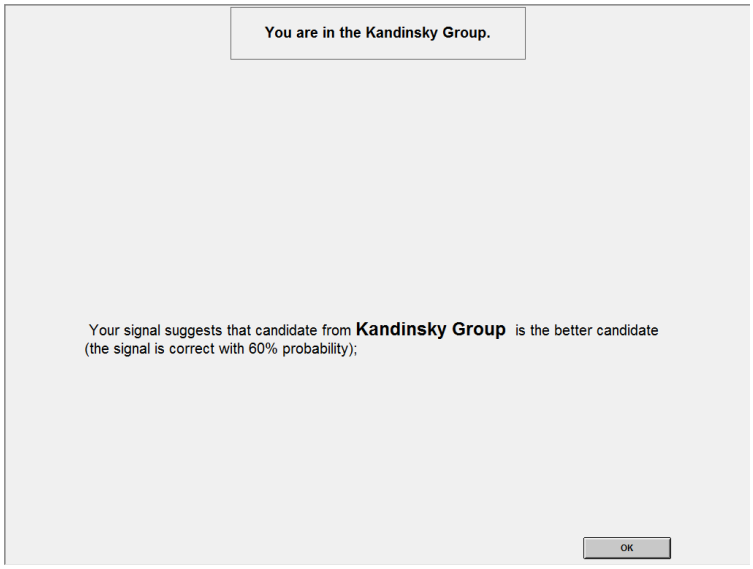
In the meantime, you can communicate with other members of your group in a chat (on the right hand side of the screen) and offer them help or ask for help. These messages are only visible to members of your group. You have no way to communicate with the other group. The same applies to members of the other group.

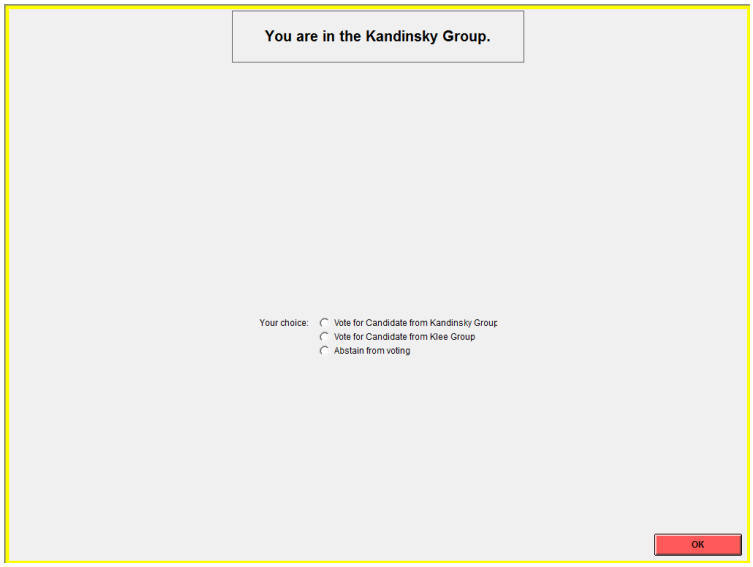
OK

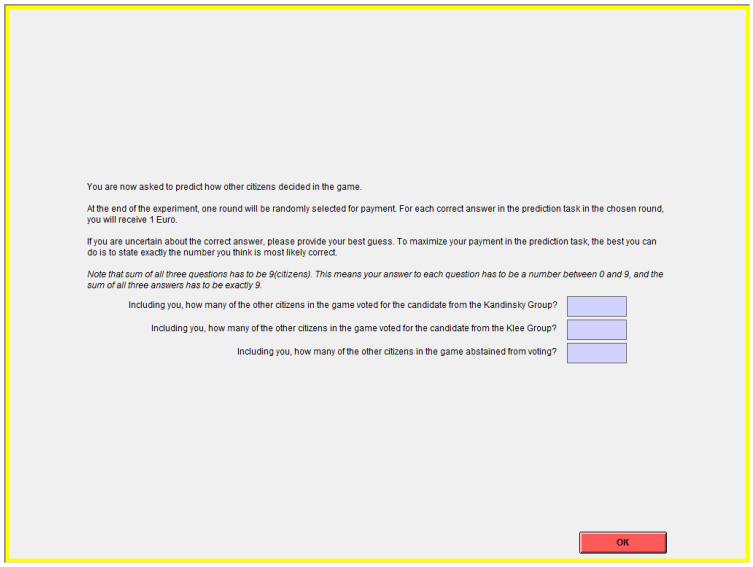

You are in the Klee Group
This painting is by Klee
Painting 6
Discussion (Your "Chat ID": KLEE7)
This painting is by Kandinsky
Painting 7
Write your comments here and press ENTER.
Painting 6 is by Kandinsky Klee
Painting 7 is by Kandinsky Klee
Confirm


You are in the Klee Group
This painting is by Klee
Painting 6
Discussion (Your "Chat ID": KLEE10)
This painting is by Kandinsky
Painting 7
Write your comments here and press ENTER.
Painting 6 is by Kandinsky Klee
Painting 7 is by Kandinsky Klee
Confirm


You are a voter.
OK


You are in the Kandinsky Group.
Your signal suggests that candidate from Kandinsky Group is the better candidate
(the signal is correct with 60% probability);
OK


You are in the Kandinsky Group.
Your choice:
Vote for Candidate from Kandinsky Group
Vote for Candidate from Klee Group
Abstain from voting
OK


You are now asked to predict how other citizens decided in the game.
At the end of the experiment, one round will be randomly selected for payment. For each correct answer in the prediction task in the chosen round, you will receive 1 Euro.
If you are uncertain about the correct answer, please provide your best guess. To maximize your payment in the prediction task, the best you can do is to state exactly the number you think is most likely correct.
Note that sum of all three questions has to be 9(citizens). This means your answer to each question has to be a number between 0 and 9, and the sum of all three answers has to be exactly 9.
Including you, how many of the other citizens in the game voted for the candidate from the Kandinsky Group?
Including you, how many of the other citizens in the game voted for the candidate from the Klee Group?
Including you, how many of the other citizens in the game abstained from voting?
OK

Including you, there are 5 voters from the Kandinsky Group and 4 voters from the Klee Group.

OK

You are in the Kandinsky Group.

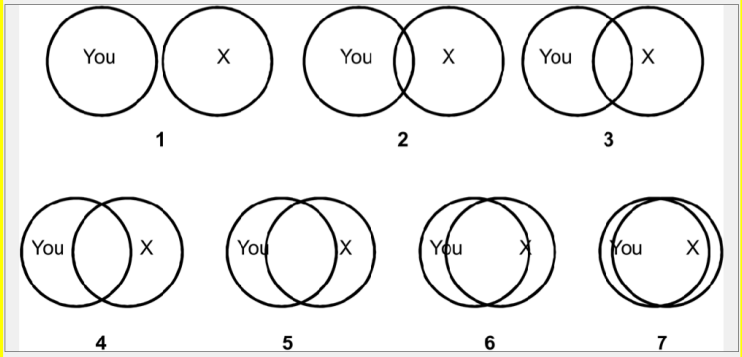
Including you, there are 5 voters from the Kandinsky Group and 4 voters from the Klee Group.

Your signal suggests that candidate from **Kandinsky Group** is the better candidate (the signal is correct with 60% probability);

OK

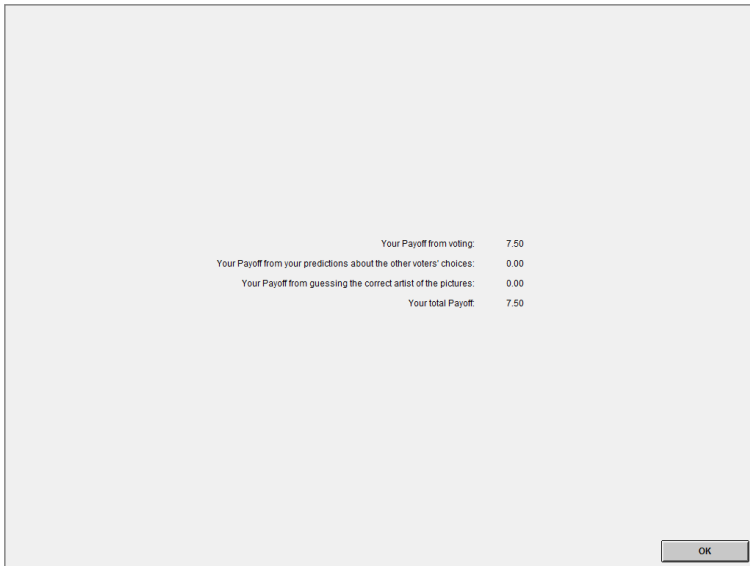
You are in the Kandinsky Group.

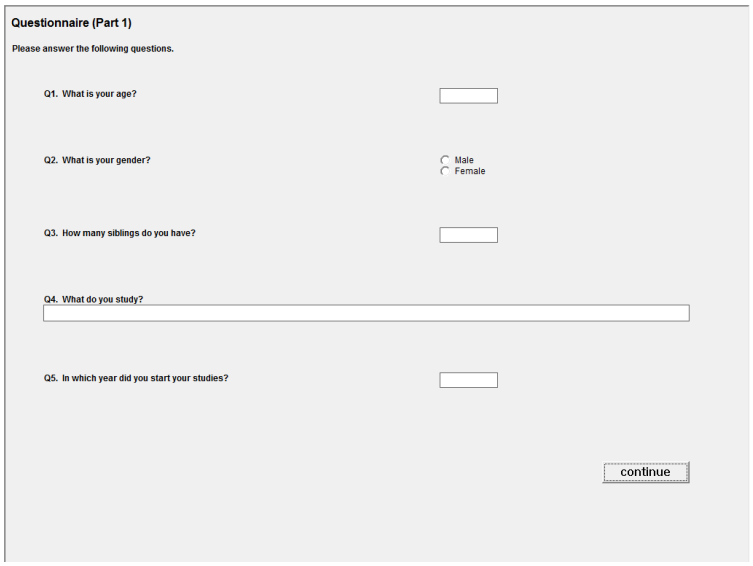
In the following figure we ask you to consider which of these pairs of circles best describes your relationship with a KANDINSKY group member in all questions that follow.
In the figure "X" serves as placeholder for a KANDINSKY group member, that is, you should think of "X" being a KANDINSKY group member.
By selecting the appropriate number please indicate to what extent you and a KANDINSKY group member are connected.

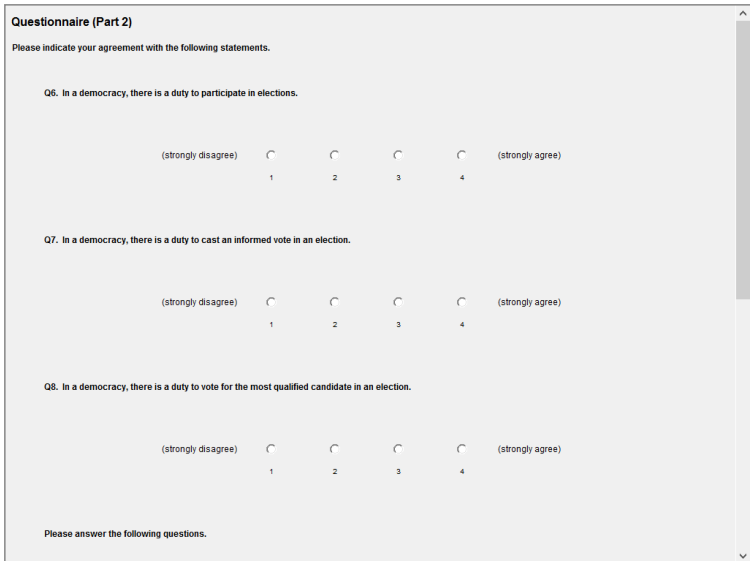


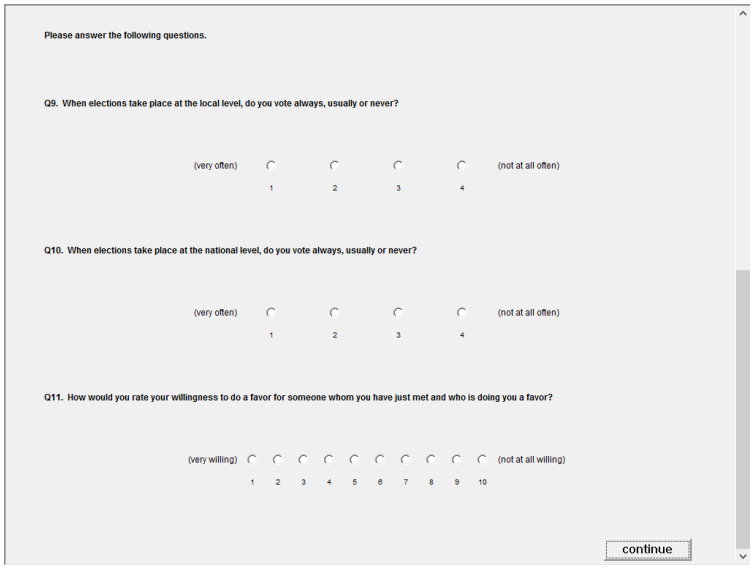
Your answer: 1 2 3 4 5 6 7 prefer not to answer

OK


Your Payoff from voting: 7.50
Your Payoff from your predictions about the other voters' choices: 0.00
Your Payoff from guessing the correct artist of the pictures: 0.00
Your total Payoff: 7.50
OK


Questionnaire (Part 1)
Please answer the following questions.
Q1. What is your age?
Q2. What is your gender?
Male
Female
Q3. How many siblings do you have?
Q4. What do you study?
Q5. In which year did you start your studies?
continue


Questionnaire (Part 2)
Please indicate your agreement with the following statements.
Q6. In a democracy, there is a duty to participate in elections.
(strongly disagree) 1 2 3 4 (strongly agree)
Q7. In a democracy, there is a duty to cast an informed vote in an election.
(strongly disagree) 1 2 3 4 (strongly agree)
Q8. In a democracy, there is a duty to vote for the most qualified candidate in an election.
(strongly disagree) 1 2 3 4 (strongly agree)
Please answer the following questions.



Please answer the following questions.

Q9. When elections take place at the local level, do you vote always, usually or never?

(very often) 1 2 3 4 (not at all often)

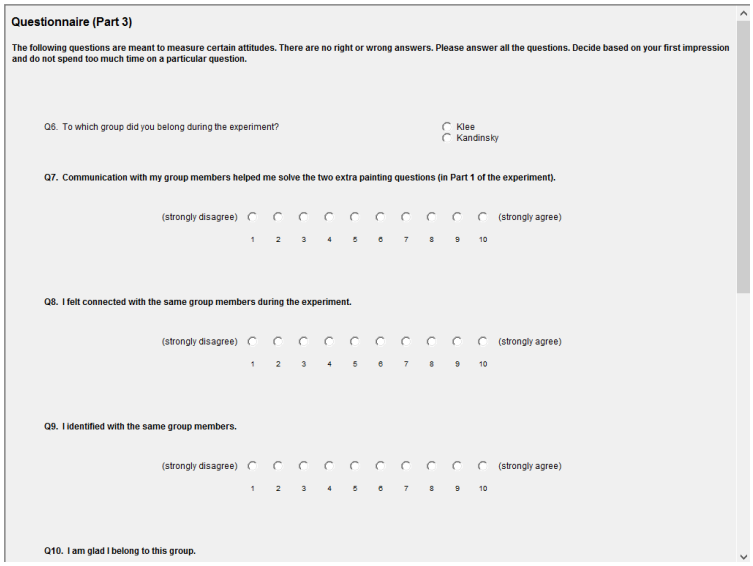
Q10. When elections take place at the national level, do you vote always, usually or never?

(very often) 1 2 3 4 (not at all often)

Q11. How would you rate your willingness to do a favor for someone whom you have just met and who is doing you a favor?

(very willing) 1 2 3 4 5 6 7 8 9 10 (not at all willing)

continue



Questionnaire (Part 3)

The following questions are meant to measure certain attitudes. There are no right or wrong answers. Please answer all the questions. Decide based on your first impression and do not spend too much time on a particular question.

Q6. To which group did you belong during the experiment? Klee Kandinsky

Q7. Communication with my group members helped me solve the two extra painting questions (in Part 1 of the experiment).

(strongly disagree) 1 2 3 4 5 6 7 8 9 10 (strongly agree)

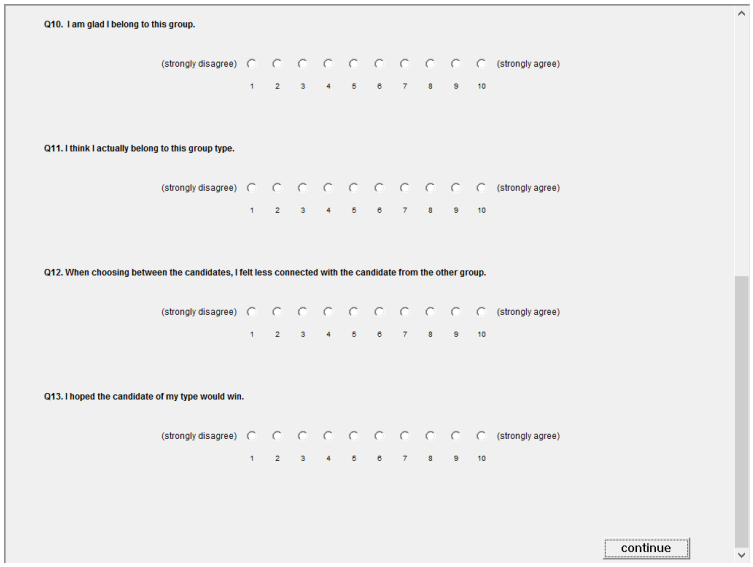
Q8. I felt connected with the same group members during the experiment.

(strongly disagree) 1 2 3 4 5 6 7 8 9 10 (strongly agree)

Q9. I identified with the same group members.

(strongly disagree) 1 2 3 4 5 6 7 8 9 10 (strongly agree)

Q10. I am glad I belong to this group.



Q10. I am glad I belong to this group.

(strongly disagree) 1 2 3 4 5 6 7 8 9 10 (strongly agree)

Q11. I think I actually belong to this group type.

(strongly disagree) 1 2 3 4 5 6 7 8 9 10 (strongly agree)

Q12. When choosing between the candidates, I felt less connected with the candidate from the other group.

(strongly disagree) 1 2 3 4 5 6 7 8 9 10 (strongly agree)

Q13. I hoped the candidate of my type would win.

(strongly disagree) 1 2 3 4 5 6 7 8 9 10 (strongly agree)

continue