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Abstract:
Many Western countries face the challenge of reconciling future labor demand with growing public opposition to immigration. The dynamics and underlying processes of setting immigration requirements remain unclear as research so far mainly focuses on context-specific empirical studies. We use a public good game experiment with endogenous groups to investigate how different levels of perceived migrant potential and public debate shape immigration requirements. We employ the minimal group paradigm and immigration requirements are set by in-group voting. Our results suggest that fairness and efficiency of immigration requirements may best be described by the relationship between average population indicators and required contributions of immigrants. Public debate appears to foster fair and efficient requirements if perceived migrant potential is high.

Keywords: Immigration, Public Good, Endogenous Groups, Experiment

JEL classification: C91, C92, H41, O15

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1 Introduction

Several OECD countries have shifted towards more restrictive immigration policies in response to changing economic conditions and increasing public sensitivity on migration issues since 2010 (OECD 2012a). Even before the recent economic downturn in many OECD countries, several governments have set more restrictive requirements for immigration, settlement and citizenship (Brubaker 2001, Joppke 2004). Anti-immigration sentiment is often seen as a response to increased immigration and ethnic diversity levels in recent decades, especially in Western European countries (OECD 2012b).

Examples of a restrictive trend in immigration policy include income or employment requirements as well as language and civic knowledge requirements for immigration, settlement and naturalization (van Oers et al. 2010; Joppke 2004; Joppke 2007; Groenendijk 2011; Carrera et al. 2009; Bauböck and Joppke 2010). In most OECD countries, immigrants have to provide evidence for a certain level of economic resources[1] in order to be allowed to legally immigrate for work purposes, to reunite with family members, to be permitted permanent residence (settlement) or to be eligible for naturalization (see Goodman 2010 for an overview; Healy and Reichel 2013).

In the case of labor migration, the EU blue card – an attempt to attract highly skilled workers from third countries by harmonizing entry and residence conditions throughout the EU (Council Directive 2009/50/EC, European Union (2009)) – sets relative income requirements. The Directive lays out general economic requirements for migrant worker as 'a work contract or binding job offer with a salary of at least *one and a half times* the average gross annual salary paid in

[1] Mostly measured by one or a combination of attributes like income levels, employment record, tax records, social benefit uptake, employment offers.

the Member State concerned'.[2] Such initiatives prompt the question whether and on what basis immigration income thresholds seem appropriate and fair (e.g. Bauböck and Joppke 2010).

Due to a continuous demographic decline, many OECD countries are faced with an increasing need for labor migration.[3] Given the 'competition for global talent', immigration requirements do not only pose normative questions of fairness but also the question of efficiency: Could restrictive requirements deter migration and thereby exacerbate labor shortages in certain sectors? Policy makers are faced with the 'uncomfortable' challenge of reconciling increasing labor demand with public opinion that increasingly disapproves of immigration.

Cross-country variation and the constant change of policies over time make most empirical research on this issue difficult to generalize (Ruhs 2008). We circumvent this issue by using experimental economic methods. By employing a laboratory experiment, we are able to provide insights into the fundamental group decision making processes that underlie immigration requirements; as such our approach is novel and supplements evidence provided by sociological or political studies of immigration requirements (e.g. Massey and Espinosa 1997; Scheve and Slaughter 2001; Mayda 2006).

In order to mirror the immigration situation in the laboratory, we randomly selected our subjects into two groups, citizens (red players) and migrants (blue players). The seminal works by Tajfel et

2 Member states may lower the salary threshold to a factor of 1.2 for certain professions where there is a particular need for third-country workers. Instead of relative requirements, some member states have introduced absolute thresholds. For example, regarding family migration, eight EU member states have adopted rules fixing the amount of resources required from the sponsor in order to be eligible for family reunification (Pascouau and Labayle 2011). Only recently, the UK has substantially increased income requirements for family reunion (Home Office 2012).

3 In the case of Germany, a McKinsey study estimates a labor shortage of two million workers in 2020. The Prognos Institute estimates a labor force gap of 5.2 million workers in 2030 (see Bundesagentur für Arbeit 2011; Kolodziej 2012).

al. (1971) and Billig and Tajfel (1973) show that such a random assignment of roles is sufficient to create feelings of in-group affiliation and in-group favoritism.[4] We let the citizens play a giving-and-taking public good game (see Khadjavi and Lange, forthcoming), but restrict migrants' opportunities to contribute to or receive returns from a public good.[5] Periodically, citizens set an immigration requirement in the form of a minimum contribution requirement for migrants. In our experimental setup as well as in real life, we expect that immigration requirements are always higher than population averages regardless of economic effectiveness.

Our design enables us to identify which migration scenarios – namely, perceived high or low potential migrants - and societal factors – namely, a 'public' debate on immigration – lead to more restrictive or more liberal immigration requirements. Particularly from a public choice perspective, it is informative to analyze the effect of different in-group decision procedures on immigration policy. Voting on an issue, which has not been discussed, may result in the establishment of a different policy compared to voting on a policy that is preceded by a debate of in-group members. Furthermore, it is not clear whether voting for a policy that sets a threshold for immigrant contributions establishes contribution norms for the in-group, as well. Such social norms may help to overcome the social dilemma associated with public good provision by private actors. Conversely, in-group members may decrease their contributions or even exploit the public good while out-group members are bound to contribute. The establishment of a 'bar' (required contribution level) may deter potential immigrants despite prospective payoff gains.

Our results suggest that immigration policy-makers would be well-advised to design economic requirements for labor migration that are in appropriate relation to average performance of the population and based on public debate. In our experiment, greater *migration policy coherence* supported by public immigration debate leads to greater perceived fairness of the policy, greater

4 This setup is commonly referred to as minimal group paradigm.

5 See Ledyard (1995) and Chaudhuri (2011) for surveys on public good games.

voluntary contributions to the public good by both citizens and migrants, and the greatest overall welfare. Moreover, our results highlight significant effects of immigration debates. In a labor demand context, negative frames of immigrants' potential can result in more restrictive immigration requirements regardless of immigrants' actual potential to contribute to the public good.

Only a limited number of experimental economic studies on public good provision by private actors include processes of endogenous group formation so far.[6] We review papers with endogenous group formation based on other subjects' characteristics and actions more closely.[7] The literature refers to Ehrhart and Keser (1999) as the first experimental study to allow for endogenous re-grouping. They find that subjects who contributed high amounts to the public good were 'chased' by low contributors. Further related works in this direction include Coricelli et al. (2004), Cinyabuguma et al. (2005), Page et al. (2005), and Gunnthorsdottir et al. (2010).

Closer to our research question, Ahn et al. (2008) investigate endogenous group formation with entry and exit mechanisms: both entry and exit were free or one of them could be permitted by the group members with a majority voting rule while the other was free.[8] Voting was based on individual subjects who might enter the group, given their contribution history in their present group. Our approach differs from the current literature along several dimensions. First and most importantly, we use predefined groups of insiders and outsiders, what we refer to as citizens and migrants, to mirror the setting of individuals born in different countries. Second, citizens do not

6 Endogenous group formation in public good games describes the process of a group forming based on some decision making of the players of the game. Such a process contrasts the standard public good game in which the user group is exogenously determined and fixed.

7 Note that there is a strand of literature that examines endogenous group formation in public good games with self-selection into groups with pre-set institutions (e.g. Brekke et al. 2011; Gürerk et al. 2006; Gürerk et al. 2011).

8 Note also that a companion paper Ahn et al. (2009) investigates endogenous group formation when the public good is congestible.

select certain migrants, but they set a policy that applies to all migrants. Third, in our design migrants may hold bargaining power and reject the immigration requirement set by citizens. Fourth, our design includes debate on the requirement which is not available in the present literature. Based on all these factors, we consider our design novel and informative for the literature on endogenous user groups in public good games.

The remainder of this work is structured as follows: Section 2 lays out the experimental design, including predictions and information on experimental procedures. The results are presented in section 3. Section 4 discusses the implications of our results for policy and section 5 concludes.

2 Experimental Design

In this section, we will first introduce the two dimensions of our 2x2 experimental design. Next, we will formalize our design and develop predictions that explain how behavior may change depending on the existence of other-regarding social preferences. In the last part of this section, we will describe the procedures of the experiment.

2.1 Two Dimensions of Immigration Policy

We designed our experiment to resemble a Western welfare-state setting. Our baseline scenario employs a non-satiated public good. As mentioned above, most Western welfare states are characterized by an ageing population and an associated future labor demand. We apply the generalized giving-and-taking framework to the public good game. This framework was first introduced by Khadjavi and Lange (forthcoming). The giving-and-taking framework represents the fundamental distribution mechanism common in Western welfare states. 'Giving' to the public good equals paying taxes and 'taking' from the public good equals receiving public assistance.

For our study, we randomly select subjects to be in two sub-groups: 'citizens' and 'migrants'.[9] We use a partner matching that is consistent with the analogy of citizenship and is useful for our analysis of behavior over time. Citizens are always 'in the country' and are able to enjoy the consumption of a public good (with an initial public good endowment). They need to decide how much to give to the public good (analogy: donate, contribute) or take (analogy: receive a social transfer). Initially, all migrants are 'outside of the country' and thus do not profit from the public good. To keep our design simple there is no second public good outside the country that migrants may profit from. As out-group members have fewer individual returns to the public good, we introduce an (economic) hierarchy between the two groups and define the direction of migration. As potential payoffs are higher for citizens, migrants have an incentive to migrate.

Different within-group initial endowments introduce socioeconomic stratification of both citizens and migrants. We added this to our calibration in order to analyze how the initial endowment (i.e. socioeconomic status) determines contributions to the public good and voting on immigration policy. One can also think of this endowment as a proxy for achievement (productivity) potential or human capital.[10]

Our 2x2 experimental design varies the freedom of migrant choice and the opportunity for debate among citizens about the immigration requirement. An overview of our design is provided in Table 1. The first dimension, the freedom of migrant choice, may have two different conditions: The two dictator treatments (Dict_) do not give migrants the choice to stay outside the country if their endowments are sufficient to permit entry (i.e. if their endowments are greater

[9] Note that the vocabulary we use in this work (e.g. 'citizens', 'migrants', 'country', 'giving', 'taking', etc.) does not match the language of the instructions and programs of the experiment. For example, we called in-group players 'red players' and out-group players 'blue players'. For the instructions, see appendix B.

[10] Note that there is a strand of literature on heterogeneous endowments in public good games, including Chan et al. (1999), van Dijk et al. (2002), Cherry et al. (2005), Buckley and Croson (2006), Sadrieh and Verbon (2006).

than the immigration requirement). Conversely, the ultimatum treatments (Ulti_) provide the opportunity for migrants to accept or reject the immigration requirement set by citizens, even if they could meet the requirement.

Table 1. 2x2 Experimental Design.

		Migrant choice / Perceived migration	
		Ultimatum treatment / High perceived migrant potential	Dictator treatment / Low perceived migrant potential
Ex ante Debate? *(via a chat of red in-group members)*	yes	Ulti_chat	Dict_chat
	no	Ulti_NOchat	Dict_NOchat

We designed the dictator vs. ultimatum treatment manipulation to resemble different migration flows in the real world. In the ultimatum treatment, migrants have more bargaining power as they can refuse immigration despite eligibility. Higher bargaining power of migrants indicates citizens' *perception* of high-potential migration. Conversely, in the dictator treatments, migrants have less bargaining power which implies fewer choices. No bargaining power of migrants implies citizens' *perception* of low-potential migration. The difference in migration scenarios can be understood as a signaling mechanism of varying skill distributions of different migration flows.[11] However, the signal itself does not provide information about actual contribution (productivity) differentials between migrants in the ultimatum (perceived high-potential) and dictator (perceived low-potential) treatments. Both groups hold similar contribution potential. If one were to look for real life examples of both categories, we can broadly distinguish countries that have traditionally

[11] Note that our design does not include a competition among countries for migrants. Such an extension would have complicated our design considerably. In this work we are primarily interested in the consequences of migrants' bargaining power on citizens' decision on the magnitude of the 'bar', their contributions to the public good and associated the fairness. Like many other directions, however, we regard a game of competition among countries as a fruitful avenue for future research.

attracted low skilled migration (Western Europe without the UK)[12] and countries that have traditionally attracted high skilled migration (USA, Canada, UK) (OECD 2012b).

The second dimension varies the availability of a free-form text debate among citizens via a chat screen. In the chat treatments (_chat) citizens (but not migrants) are able to debate freely about the game and the height of the bar before voting for it in private. This treatment stands for public debate in society. Citizens can debate the advantages and disadvantages of liberal vs. restrictive immigration requirements. Analogous to the real world, citizens can exchange viewpoints, present evidence and argue in favor or against a certain policy. The public debate treatment allows us to analyze the effect that it has on citizens' contributions to the public good and on the level of the immigration requirements (will debate lower the requirement?). Most importantly, we will analyze how debate interacts with different perceptions of potential migration flows. While debate may lead to a more restrictive policy in one case, it could lead to a more liberal one in another. This feature is important as it may reveal motivational channels of subjects playing as citizens in our experiment.

2.2 Formalization

In our experiment, we match three citizens and three migrants (i.e. $n = 6$) in a group. By definition, citizens are beneficiaries of the public good of the 'country', while migrants initially remain outside and may *decide* to immigrate into the country or not (in the Ulti_ treatments) or *have to* immigrate into the country given that they are able to fulfill the minimum contribution requirements (in the Dict_ treatments). We defined the payoff of an individual i 'residing within the country' as

[12] See guest worker programs and higher share of family and humanitarian migration in continental Europe.

$$\pi_i = w_i - c_i + h\left(E + \sum_{j=1}^{n} c_j\right)$$

with the private endowment w_i, initial public good condition E, the marginal per capita return from the public good $h < 1 < hn$ and, in principle, private contribution $c_i \in [-\frac{E}{n}, w_i]$. For a migrant j residing outside the country, the payoff is $\pi_j = w_j$. Note that in our calibration, we set $h = 0.5, E = 60$ Taler so that $\frac{E}{n} = 10$ Taler; 'Taler' is the artificial currency in our experiment. The initial private endowments w_j either amount to $w^{low} = 5\,Taler$, $w^{mid} = 10\,Taler$ or $w^{high} = 15\,Taler$ so that for every endowment level, there is exactly one citizen and one migrant. Table 2 illustrates the setup for a given partner-group. We include heterogeneous endowments in our design to learn more about the motivation of different types of citizens. For instance, low-endowed citizens may vote for lower or higher bars compared to high-endowed citizens. They may show distinct sympathy with low-endowed migrants and aim to set a low bar. Conversely, low-endowed citizens may vote for substantially higher bars in order to avoid losing their relative position in the income rank.

Table 2. Grouping.

Random grouping of members and random allocation of initial endowment		Citizens (instructions: "red players")	Migrants (instructions: "blue players")
Initial Endowment	5	1 Player	1 Player
	10	1 Player	1 Player
	15	1 Player	1 Player

The decision stages in our experiment are: (1) citizens set a requirement for migrants (all treatments), (2) if eligible, migrants individually decide to accept or reject the requirement (only

Ulti_ treatments), and (3) citizens and migrants simultaneously decide how much to contribute to the public good (all treatments).[13]

Hence, the decision problem of migrant j includes decision stages two and three in the Ulti_ treatments and stage 3 in the Dict_ treatments. In the Ulti_ treatments, in stage two, j needs to decide whether to accept the requirement and immigrate (i.e. $e_j = 1$) or not ($e_j = 0$). The third stage is the decision on the private contribution to the public good c_j. Conversely, citizen i always faces decision stages 1 and 3: she needs to vote on the immigration requirement r and decide on her contribution to the public good c_i. In the following, we formulate predictions regarding the requirement $r \in [-\frac{E}{n}, w^{high}]$, i.e. in our calibration between -10 and 15 Taler, set by citizens for migrants. Hence, the action set of a citizen i always reads $c_i \in [-\frac{E}{n}, w_i]$. The action set of a migrant j reads $c_j \in [e_j r, e_j w_j]$, with $e_j \in \{0,1\}$. In the Dict_ treatments $e_j = 1$ if $r \leq w_j$, else $e_j = 0$. In the Ulti_ treatments $e_j = 1$ if $r \leq w_j$ and the migrant *accepts* the requirement, else $e_j = 0$.

2.3 Predictions for Payoff Maximization

By solving $\max_{c_i} \pi_i = w_i - c_i + h\left(E + \sum_{j=1}^{n} c_j\right)$ we get the standard solution for the linear public good game $\frac{\partial \pi_i}{\partial c_i} = -1 + h < 0$, which translates to the prediction that citizens appropriate as much as possible, and that migrants contribute the minimal amount or appropriate as much as they can. We summarize

Prediction 1a. *Citizens will appropriate the maximal amount* $c_i = -\frac{E}{n}$*, and migrants contribute the minimum requirement* $c_j = r$.

[13] In order to summarize our design, Figures A.1a and A.1b depict the two or three decision stages in Dict_ and Ulti_ treatments respectively in a simplified 2-player case.

With this prediction, we can turn to stages one and two of the game including the setting of the bar by citizens and acceptance or rejection of r by migrant in Ulti_ or direct inclusion or exclusion of migrants in Dict_. Let us first predict r for the Dict_ cases. Note again that there are three migrants with endowments $w^{low} = 5\,Taler$, $w^{mid} = 10\,Taler$ or $w^{high} = 15\,Taler$ such that for every endowment level there is exactly one migrant. Payoff maximizing citizens aim at maximizing migrants' contributions to the public good by choosing the optimal r; however as the requirement increases migrants are excluded automatically, starting with the migrant endowed with $w^{low} = 5\,Taler$. More formally, the sum of contributions by migrants $C_{migrants}$ is

$$C_{migrants} = \begin{cases} 3r & if \quad r \leq 5 \\ 2r & if \quad 5 < r \leq 10 \\ r & if \quad r > 10 \end{cases}$$

and $C_{migrants} = 20$ is maximal with $r = 10$. Note that we chose the parameters to generate this interior solution. Payoff-maximizing citizens therefore set the optimal requirement $r^*_{Dict} = 10$ in the Dict_ treatments. The calibration of our design allows for a second straightforward prediction: payoff-maximizing migrants accept *any* requirement.[14] Hence, based on payoff-maximizing citizens and migrants, we formulate

Prediction 2a. *Citizens will vote for requirements of* $r^*_{Dict} = r^*_{Ulti} = 10$. *Migrants will either immigrate automatically in Dict_ or accept this requirement voluntarily in Ulti_.*

[14] To clarify this point, consider the extreme case of a migrant j with $w_j = 15$ and $r = 15$. Further, assume that all three citizens behave purely selfish and contribute $-3\frac{E}{n}$ (i.e. -30 Taler) in sum. Migrant j will still receive an income of $15 - 15 + 0.5(60 - 30 + 15) = 22.5$ Taler which is greater than staying outside and receiving 15 Taler. Likewise, a migrant k with $w_k = 5$ who accepts a requirement of $r = 5$ will receive an income of $5 - 5 + 0.5(60 - 30 + 5) = 17.5$ Taler 'inside the country' compared to only 5 Taler 'outside'.

Standard game theory is also straightforward when it comes to the chat opportunity among citizens. That is, it regards promises and non-binding contracts as cheap talk. Consequently, there should be no difference between citizens' decision making after a debate and citizens' decision making without a debate:

Prediction 3a. *Debate is cheap talk. There are no differences in decision making between _chat and _NOchat treatments.*

2.4 Behavioral Economic Predictions

Let us now discuss alternative predictions inspired by insights from behavioral economic research. Surveys on the standard public good game by Ledyard (1995) and Chaudhuri (2011) as well as results on the giving-and-taking public good game by Khadjavi and Lange (forthcoming) show that individuals frequently and voluntarily contribute to public goods. Other-regarding, social preferences may motivate such behavior (Meier 2007). Therefore, the first behavioral economic prediction reads

Prediction 1b. *On average, citizens do not appropriate the maximal amount* $c_i > -\frac{E}{n}$*, and migrants contribute more than the minimum requirement* $c_j > r$.

Further, let us consider stage two in the Ulti_ treatments (i.e. the decisions of migrants to accept or reject the requirement r). Compared to migrants, citizens are privileged based on two characteristics: (1) the privilege to reside within the country at all times and (2) the privilege to contribute to and appropriate the public good freely. Let us assume that migrants value their social status, represented by their action set, and that they care about intentions of others. The idea is closely related to models of reciprocity (e.g. Rabin 1993; Dufwenberg and Kirchsteiger 2004; Falk and Fischbacher 2006). Citizens may then anticipate and incorporate migrants' preferences for reciprocity when setting the bar. The intuition is that if migrants get too

disadvantaged, they will lose utility due to what they perceive as an unfair policy. Consequently, migrants will respond by rejecting a sufficiently unfair policy. Hence, in Ulti_ citizens may need to set the requirement *below* the optimal requirement $r^*_{Dict} = 10$ in order to get migrants to accept it (and thereby secure some payoff from migrants' contributions). On the contrary, migrants cannot reject an 'unfair' requirement in Dict_ and citizens can disregard migrants' preferences for reciprocity. As a result the requirement in Ulti_ may be lower than the requirement in Dict_:

Prediction 2b. *If migrants are sufficiently reciprocating, then citizens set* $r^*_{Ulti} < r^*_{Dict}$.

Finally, let us turn to the chat opportunity. Indeed the behavioral economic literature suggests that a debate among citizens in the _chat treatments potentially changes public good contributions and votes on the requirement. As suggested by the findings of Ostrom et al. (1992) and Brosig et al. (2003), the chat opportunity may offer a mechanism for citizens to coordinate the social dilemma situation of the public good game. We predict:

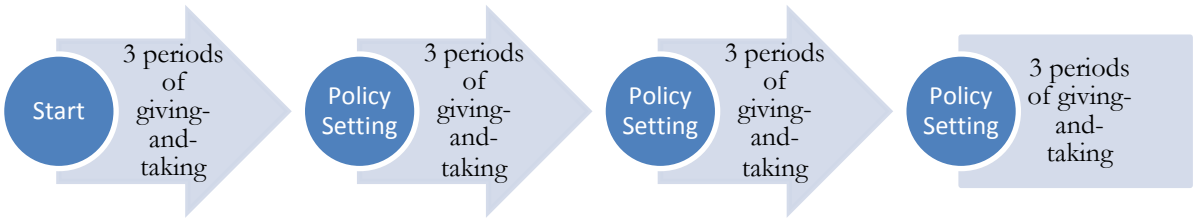
Prediction 3b. *Debate is a coordination mechanism. Public good provision is greater in _chat than in _NOchat treatments.*

With regard to the requirement, it is even harder to formulate predictions without a set of additional assumptions. Debate might change the requirements based on some group norm; if such a group norm evolves, it may be a norm of fairness or equality which could develop in a lower requirement or a norm of in-group exclusiveness which could develop in a higher requirement. These are just two examples of how debate may play a role. While we regard the possibility of such norms to evolve as a valuable feature that we will investigate with our design, we refrain from extended speculations on this matter.

2.5 Course of Events & Procedures

Figure 1 provides an overview of the timeline of our experiment. After three periods of public good game interaction (of citizens only), citizens were able to implement a migration policy (i.e. to 'set a bar'). After a bar had been set, all players within the country (i.e. citizens potentially joined by (some) migrants) again played the public good game for three periods. The process was then repeated after period 6 and a new policy was implemented. The game was played for another three periods. After period 9, citizens had one last opportunity to adapt their policy. The median requirement of the three citizens (majority rule) was implemented as policy result after every 'policy setting' procedure. We incorporated repeated voting in our design to be able to identify adjustment (and possibly convergence) of the minimum contribution requirement *r* over time. This rule resembles real circumstances where certain polices are usually debated at separate recurring instances (elections etc.).

Figure 1. Timeline of our Experiment.



All nine sessions were conducted in the computer laboratory of the University of Hamburg in May 2012. Each session lasted approximately one hour. We used z-Tree (Fischbacher 2007) for programming and ORSEE (Greiner 2004) for recruitment. In the four treatments depicted in Table 1, 240 subjects participated in groups of six, with five observations per session. In addition, we collected data on baseline contributions in the 'standard' treatment in one session (i.e. when three citizens played a public good game and there were no migrants, no chats and no setting of

any bars). This session yielded ten independent observations. Hence, we analyze the behavior of a total of 270 subjects in five treatments. All subjects were students with different academic backgrounds and no subject participated in the experiment more than once.

Once the participants were seated, a set of instructions was distributed and read out loud by the experimenter. In order to ensure that subjects understood the respective game, experimental instructions included several numerical examples and participants had to answer control questions via their computer terminals. After all periods were played, one out of the twelve periods was randomly selected for payment. Average payment over all treatments was 12.43 EUR.

3 Results

We will analyze the results of our experiment in four steps. First, we will examine treatment effects with respect to the public good provision. Second, we will investigate the drivers of the treatment effects. Third, we will analyze differences in the level of the migration requirement and migration decisions. Fourth, we will have a closer look at the arguments in the chat debates of in-group members and ex-post questionnaire answers concerning the setting of the bar.

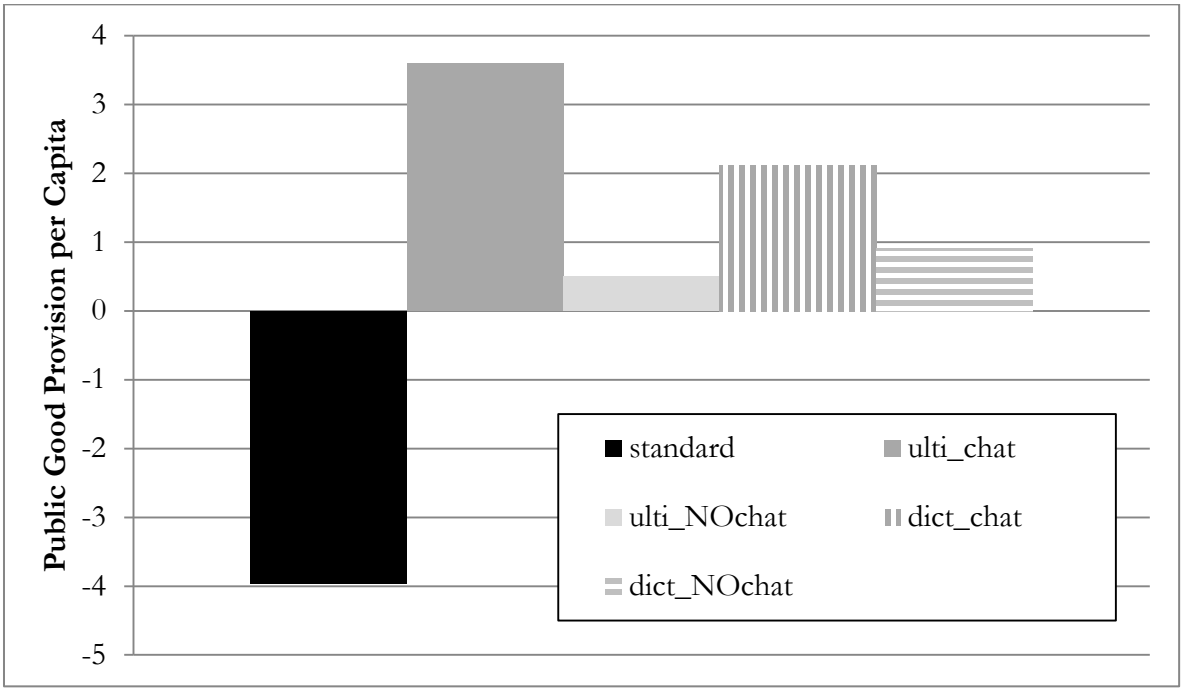
3.1 Public Good Provision

Considering all six players of a group and all periods, average contributions were the highest in Ulti_chat with an average of 3.589 Taler. This public good provision is higher than in the standard (average of -3.958 Taler, difference significant at $p = 0.0005$, Mann Whitney (MW) test), Ulti_NOchat (0.907 Taler, $p = 0.0588$, MW test) and Dict_NOchat (0.496 Taler, $p = 0.0343$, MW test) treatments. There is no significant difference between Ulti_chat and the Dict_chat treatment in which average public good provision amounts to 2.121 Taler. Figure 2 depicts public good provision averaged over all 12 periods and for all player types and Figure 3 depicts time

trends. Table 3 provides descriptive statistics.[15] In accordance with earlier findings on social dilemmas, e.g. by Ostrom et al. (1992) on common pool resources and Brosig et al. (2003) on the public good game, we find that communication helps to foster and coordinate contributions. We report:

Result 1. *Considering all periods and player types, contributions to the public good were greater in _chat than in _NOchat treatments. Our data supports Prediction 3b.*

Figure 2. Public Good Provision, Citizens and Migrants, Average over all Twelve Periods.



[15] Table A.1 in appendix A provides an overview of pairwise Mann-Whitney tests with one observation per group averaged over all 12 periods (i.e. ten independent observations per treatment).

Figure 3. Public Good Provision in the Five Treatments over Time: Citizens and Migrants.

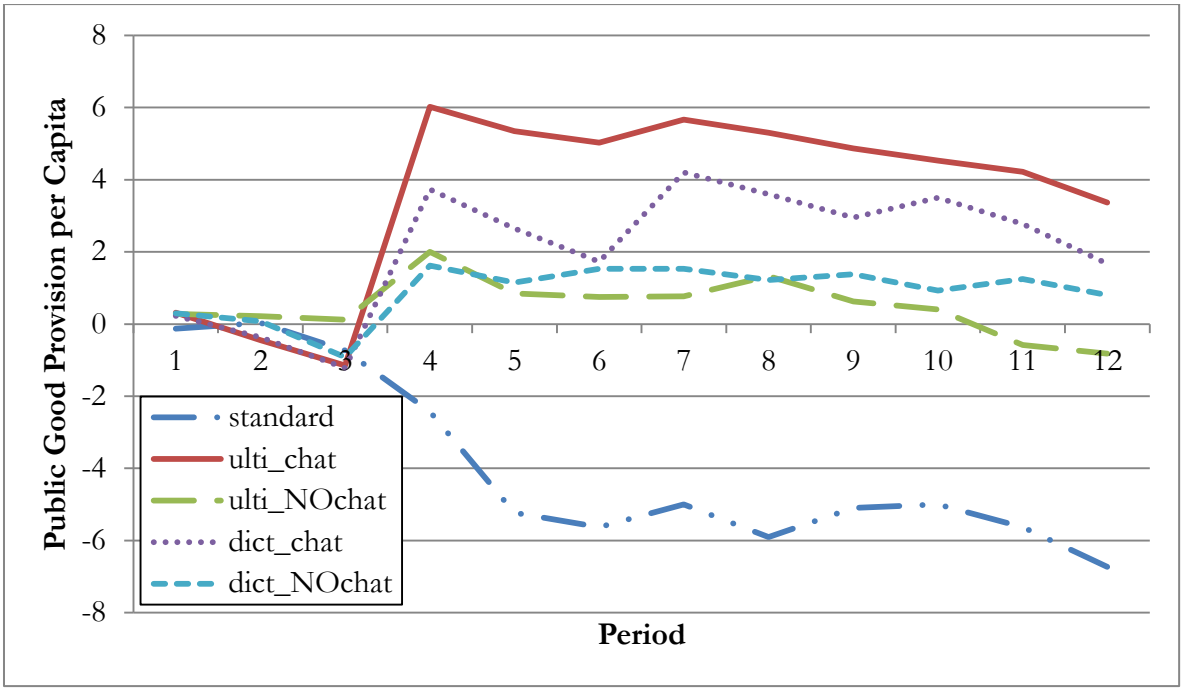


Figure 4. Public Good Provision in the Five Treatments over Time: Citizens only.

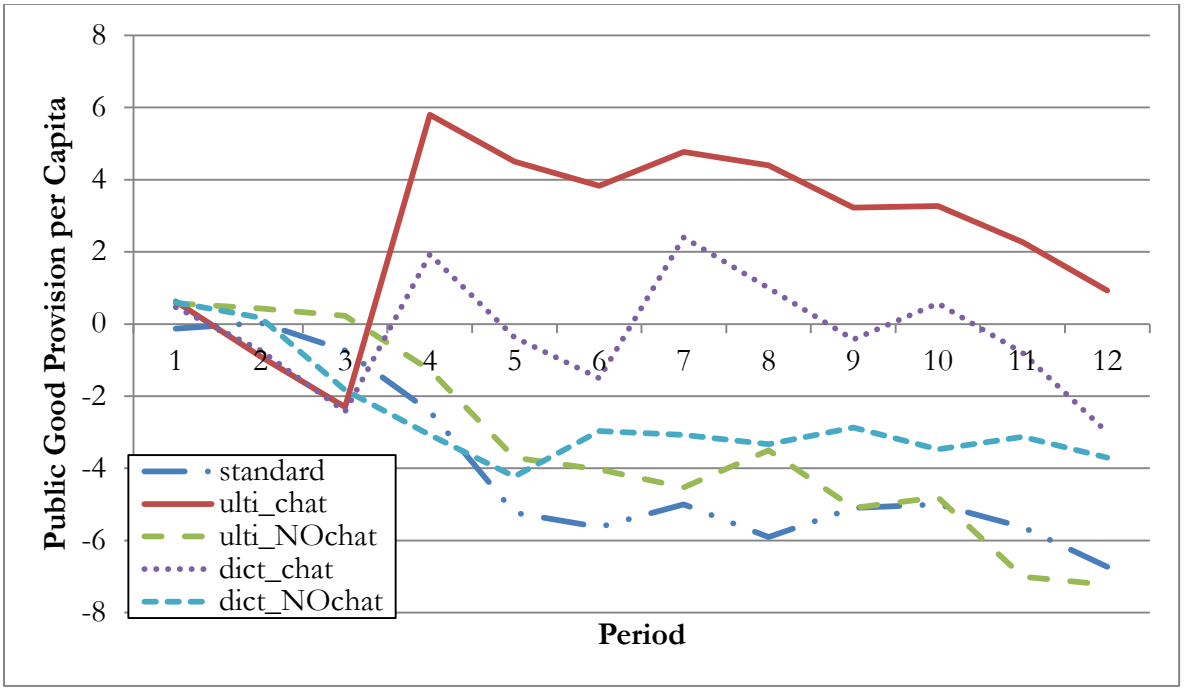


Table 3. Descriptive Statistics.

	Treatment				
	Standard	Ulti_chat	Ulti_NOchat	Dict_chat	Dict_NOchat
Individuals	30	60	60	60	60
Groups	10	10	10	10	10
Mean contribution (all players, *in Taler*)	-3.958	3.589	0.496	2.121	0.907
Mean contribution (citizens, *in Taler*)		2.536	-3.328	-0.242	-2.575
Mean *voluntary* contribution of migrants (*in Taler*)		2.757	1.176	1.662	2.215
Mean migration requirement (*in Taler*)		7.030	5.720	8.410	5.967
Percent of migrants who accepted a requirement (in %)		95.7	100.0		
Mean *accepted* requirement (*in Taler*)		6.250	5.720		
Mean *rejected* requirement (*in Taler*)		8.667			
Mean income of all player types (*in Taler*)	38.021	40.155	35.717	36.539	35.859
Mean income of citizens (*in Taler*)		48.231	44.815	46.604	45.296
Mean income of migrants (*in Taler*)		32.079	26.619	26.475	26.424

The confirmation of Prediction 3b is a product of our experimental design in which we aim to identify a potential interaction effect of public debate (chat) and different migration scenarios (ultimatum vs. dictator). After we have had a glance at the data at most aggregated level, we turn to the *contributions of citizens* (red players) in our treatments. Descriptive statistics in Table 3 report mean contributions of citizens over all twelve periods. These contributions amount to 2.536 Taler in Ulti_chat, -0.242 Taler in Dict_chat, -3.328 Taler in Ulti_NOchat and -2.575 Taler in Dict_NOchat. These mean contributions again hint at contribution differences between _chat

and _NOchat treatments. Furthermore, we observe a nearly-3-Taler-difference of contributions between Ulti_chat and Dict_chat; this is a first indication that the *interaction* of the debate with the policy decision rule may play a role.

We employ a series of regressions to further investigate similarities and differences. Table 4 reports five specifications providing evidence for important differences in contribution behavior of citizens. Figure 4 depicts contributions of citizens in our treatments over time. While specifications I to IV in Table 4 provide the reader with a better feel for the data, the full model in specification V controls for time effects, initial private endowments and treatment effects for periods four to twelve.[16] We argue that specification V is most useful for our analysis as it focuses on the periods in which treatment differences of institutions come to play a role for subjects. In periods one, two and three subjects already receive differing information, yet debate and decision rule institutions do not play a role yet, i.e. there are no treatment effects (all treatment dummies are not significantly different from zero, i.e. with $p > 0.1$). This circumstance is highlighted by results in specification I; here we observe no treatment differences in the first period by using a simple OLS specification. Considering all periods in specifications III and IV we find more evidence that a chat of citizens fosters contributions to the public good. Citizens' contributions in Ulti_chat and Dict_chat are greater than in the two _NOchat treatments. We remove periods one, two and three from our model in specification V and find evidence that citizens in Ulti_chat contribute greater amounts to the public good compared to all other treatments, including Dict_chat (all coefficients are negative and significantly different from zero

[16] For all the specifications, we observe that citizens with endowments of 10 and 15 Taler contribute higher amounts to the public good. This finding is in accordance with earlier findings in the literature by Cherry et al. (2005). While it appears to be necessary to control for this characteristic in our analysis of contributions to the public good, we are mainly interested in observing how endowment levels change votes for *setting the bar*. A discussion of this will follow below.

at $p < 0.05$). Hence, the interaction of a debate opportunity via chat and the migration scenario indeed makes a difference. We report

Result 2. *High bargaining power of migrants in interaction with a debate among citizens fosters higher contributions by citizens. Considering periods in which institutions begin to matter, citizens' contributions to the public good are significantly greater in Ulti_chat than in all other treatments.*

Table 4. Linear Regressions of Contributions to the Public Good, Individual Behavior of Citizens.

	Dependent Variable: Contribution				
	I	II	III	IV	V
Independent Variable	First period (OLS)	All periods	All periods	All periods	Periods 4 to 12
Endowment15	5.250***	3.125**	3.125**	3.125**	2.725*
	(1.819)	(1.506)	(1.399)	(1.404)	(1.495)
Endowment10	2.900*	2.713**	2.713**	2.713**	2.483*
	(1.588)	(1.266)	(1.193)	(1.198)	(1.284)
Ulti_NOchat	-0.067		-5.864***	-5.864***	-8.241***
	(2.010)		(1.509)	(1.514)	(1.654)
Dict_chat	-0.167		-2.778	-2.778	-3.689**
	(2.073)		(1.691)	(1.698)	(1.872)
Dict_NOchat	-0.033		-5.111***	-5.111***	-6.981***
	(1.964)		(1.647)	(1.653)	(1.816)
Period Dummies	-	*No*	*No*	*Yes*	*Yes*
Constant	-2.083	-2.848***	0.590	2.059	3.842***
	(1.534)	(0.795)	(1.244)	(1.351)	(1.423)
Observations	120	1440	1440	1440	1080
Individuals	120	120	120	120	120
Groups	40	40	40	40	40

Note: Random effects estimation with robust standard errors (except specification I: OLS). The 'standard' treatment is excluded. The baseline are 'Ulti_chat' for treatment effects, 'Endowment5' for effects with regard to the size of the initial endowment and Period 1 (specification IV) or Period 4 (specification V). Standard errors in parentheses. Significance: *p < 0.10, **p < 0.05, ***p < 0.01.

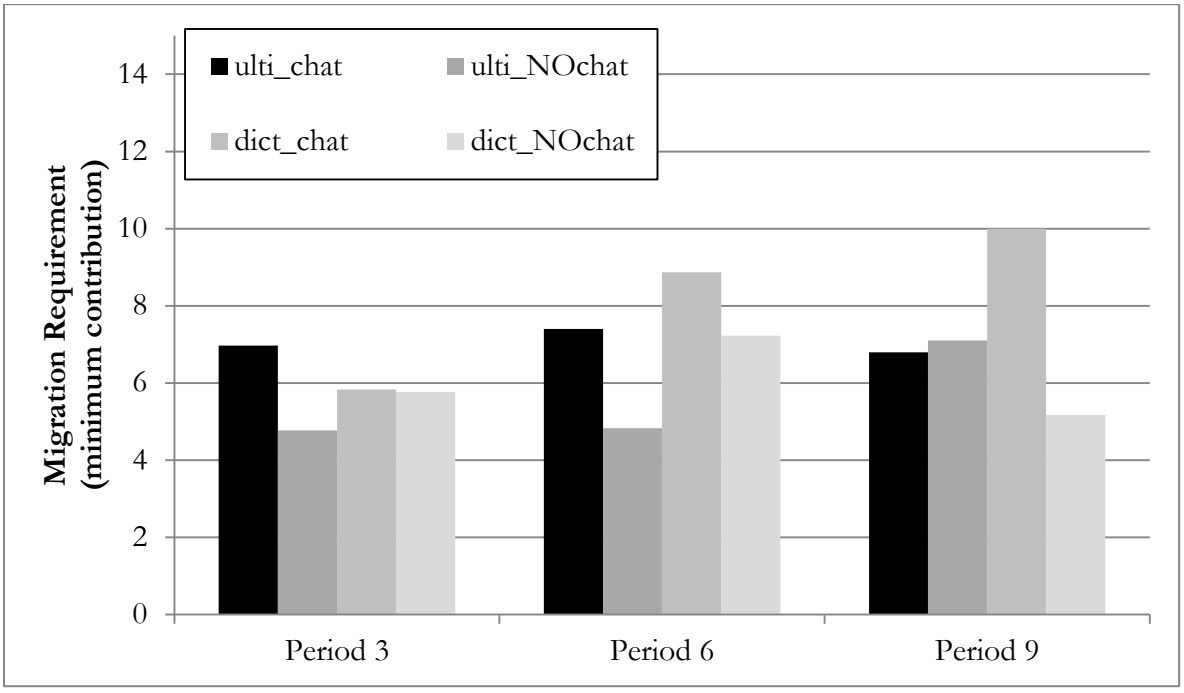
3.2 Migration Requirements

Now we consider the drivers of this result. Before we have a closer look at the contributions of migrants to the public good, we follow the chronology of the experiment in order to better understand the dynamics of the game. Next, we analyze the results of the setting-the-bar stage of

our design. Note that before periods four, seven and ten, citizens (red players) had to decide on an undisclosed vote on the migration requirement. Table 3 reports descriptive statistics on mean minimum contribution requirements. They are 7.030 Taler in Ulti_chat, 5.720 Taler in Ulti_NOchat, 8.410 Taler in Dict_chat and 5.967 Taler in Dict_NOchat. To analyze endowment and treatment effects, we employ three OLS regressions for the three decision rounds before periods four (specification VI), seven (specification VII) and ten (specification VIII); Table 5 reports estimation results and Figure 5 provides a graphic overview. Ceteris paribus, all three models do not reject the null hypotheses that votes by citizens with endowments of 5, 10 or 15 Taler were equal. Hence, we neither find any noticeable solidarity nor any discrimination of low-endowed or high-endowed citizens with their migrant counterparts:

Result 3. *Votes on minimum contribution requirements were independent from citizens' endowments.*

Figure 5. Minimum Contribution Requirements for Migrants to Join the Group.



Turning to treatment effects, we find a peculiar time trend for the minimum contribution requirement for migrants in specifications VI to VIII (Table 5). While the requirements do not differ across treatments in the first voting, subsequent requirements evolve to be especially high

in Dict_chat. By the third (and last) voting, the requirement in Dict_chat has evolved to be significantly greater than in the three other treatments (all at least at the 5 percent level). In fact, it supports *Prediction 2b*, i.e. at least in Dict_chat (but not in Dict_NOchat) the bar is set optimally at $r^*_{Dict} = 10$ Taler and higher than in the Ulti_ treatments. We formulate

Result 4. *While minimum contribution requirements are comparable and stable for all other treatments over time, the requirement in Dict_chat increased over time and was significantly higher compared to all other treatments in the final voting.*

Table 5. Linear Regressions of Migration Requirements, Individual Behavior of Citizens.

	Dependent Variable: Migration Requirement		
Independent Variable	VI First Voting, Period 4	VII Second Voting, Period 7	VIII Third Voting, Period 10
Ulti_chat	1.133 (1.867)	1.467 (1.633)	-3.200*** (0.862)
Ulti_NOchat	-1.067 (1.794)	-4.033*** (1.437)	-2.900*** (0.946)
Dict_NOchat	-0.067 (1.641)	-1.633 (1.446)	-4.833*** (1.429)
Endowment15	0.375 (1.181)	0.250 (1.267)	0.250 (1.033)
Endowment10	0.250 (1.006)	1.200 (0.875)	-0.800 (1.440)
Constant	5.625*** (1.402)	8.383*** (1.223)	10.183*** (1.440)
Observations	120	120	120
Individuals	120	120	120
Groups	40	40	40

Note: OLS estimation with robust standard errors. The 'standard' treatment is excluded. The baselines are 'Dict_chat' for treatment effects and 'Endowment5' for effects regarding the size of the initial endowments. Standard errors, clustered at the group level, in parentheses. Significance: *p < 0.10, **p < 0.05, ***p < 0.01.

This difference suggests that the driver of a lower bar in the Ulti_ treatments may be due to citizens anticipating migrants' preferences for reciprocity (a strategic reason). Altruism of citizens is a less likely explanation; else the bar in Dict_chat should not be different. Note that this finding is only possible because our experimental design employed multiple voting periods. Taking Result 2 and Result 4 together, they suggest that the interaction of public debate with

different migration scenarios, i.e. Ulti_chat vs. Dict_chat, motivates different behavior of citizens in two dimensions. First, citizens contributed significantly more resources to the public good in perceived high-potential migration settings (Ulti_). Second, citizens in perceived low-potential migration scenarios (Dict_chat) used the debate opportunity to set a bar which maximizes their payoffs. This is neither the case in Ulti_chat nor in the two treatments without chat.

How do migrants react to the requirements described above? In principle, migrants have either one or two channels to display their preferences. Given that a migrant's endowment is sufficient to allow entry into the country, she can show her preferences via her contributions in Dict_. In Ulti_ she can (1) accept or reject the requirement, and, given that she has accepted it, (2) show her preferences via contributions (like in Dict_). The descriptive statistics in Table 3 reveal that 95.7 and 100 percent of all migrants accepted the given requirement in Ulti_chat and Ulti_NOchat respectively. These numbers may not appear surprising, given the strong incentive to migrate in order to earn a higher income. They are however also a result of the relatively low requirements in the Ulti_ treatments. The mean accepted requirement in Ulti_chat is 6.25 Taler while the mean rejected requirement is 8.66 Taler. Recall that the mean requirement in Ulti_NOchat is 5.72 Taler and all migrants in Ulti_NOchat accepted the requirements. A Mann-Whitney test reports that the difference between all accepted and rejected requirements in the two Ulti_ treatments is statistically significant at the five percent level ($p=0.0229$). We find:

Result 5. *The great majority of migrants accept the requirements in the Ulti_ treatments. Those migrants who rejected requirements reacted to significantly higher requirements than those who accepted requirements.*

3.3 Migrants' Voluntary Contributions and Welfare

Next, we investigate the impact of our treatments on voluntary contributions of migrants that have entered a group. We define the size of a voluntary contribution as the absolute value of the difference between the contribution of migrant c_j and a set minimum contribution requirement

$\bar{r}$, i.e. $abs(c_j - \bar{r})$. For an adequate comparison, we need to exclude certain migrants from the analysis. First, we exclude all migrants who did not join a group in a given period. Second, we exclude all migrants who faced $\bar{r}$ such that $w_j = \bar{r}$, because these migrants have to contribute exactly the minimum requirement and cannot contribute more Taler voluntarily. Consequently, we are left with 597 observations of 80 migrants from all 40 groups. Table 3 reports and Figure 6 depicts mean voluntary contributions by treatment. These are greatest in Ulti_chat with 2.757 Taler, followed by 2.215 Taler in Dict_NOchat, 1.662 Taler in Dict_chat and 1.176 Taler in Ulti_NOchat. To measure the statistical significance of these differences, we employ two random-effects regressions that included between three and nine observations per migrant. The results are reported in Table 6. For most comparisons, we cannot reject the null hypothesis of equal voluntary contributions of migrants, except for Ulti_chat > Ulti_NOchat at the 10 percent level. We generally have to be cautious about these comparisons, as treatments did differ significantly with respect to other characteristics, such as cooperation by citizens, as discussed above. Note, however, that the minimum contribution requirements in Ulti_chat were not greater than in Ulti_NOchat and Dict_NOchat. Hence, the described effect is not solely based on a larger action space of migrants.

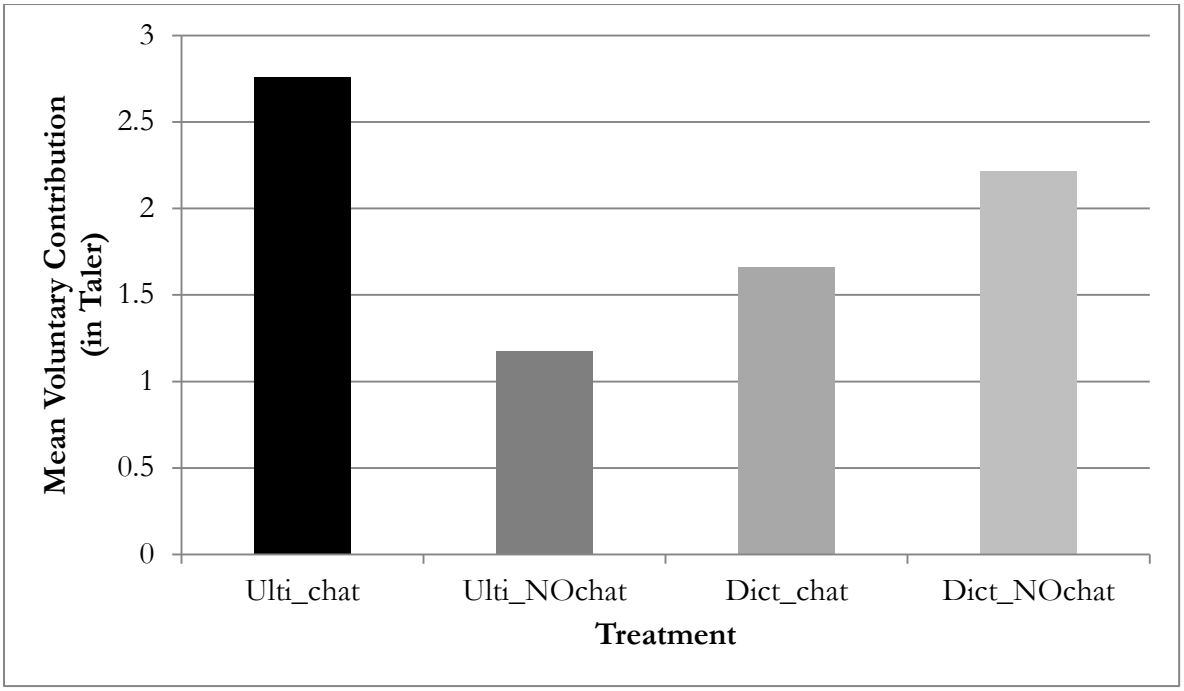
Result 6. *Voluntary contributions of migrants are the greatest in Ulti_chat. However they do not differ statistically except in one marginal case.*

Table 6. Linear Regressions of Voluntary Contributions, Migrants for Periods 4 to 12.

Independent Variable	Dependent Variable: Voluntary Contribution	
	X Excluding time effects	XI Including time effects
Ulti_NOchat	-1.297* (0.778)	-1.357* (0.784)
Dict_chat	-0.576 (0.783)	-0.669 (0.782)
Dict_NOchat	-0.406 (0.779)	-0.419 (0.804)
Period dummies	*No*	*Yes*
Constant	2.593*** (0.609)	3.083*** (0.752)
Observations	597	597
Individuals	80	80
Groups	40	40

Note: Random-effects estimations with robust standard errors clustered at the individual level. An observation is the voluntary contribution of a migrant in a period, i.e. $abs(a_l - \bar{r})$. Migrants outside of groups in a given period, i.e. if $w_l < \bar{r}$, do not yield information and are excluded from this analysis. Further, we exclude migrants who are not able to contribute more Taler voluntarily (i.e. $w_l = \bar{r}$). The 'standard' treatment is excluded. Baseline: 'Ulti_chat'. Robust standard errors in parentheses. Significance: *p < 0.10, **p < 0.05, ***p < 0.01.

Figure 6. Mean Voluntary Contribution by Migrants for Periods Four to Twelve.



Note: Here we only consider migrants who indeed have a choice to contribute more than the bar, i.e. $w_l > \bar{r}$.

What impact do these treatment effects have on income of citizens and migrants and ultimately on welfare? Figure 7 provides mean income levels over all periods split by treatments and player identities respectively and Table 3 reports descriptive statistics on income. Over all periods and identities, mean income was the highest in Ulti_chat with 40.155 Taler, followed by 38.021 Taler in the Standard treatment, 36.539 Taler in Dict_chat, 35.859 Taler in Dict_NOchat and 35.717 Taler in Ulti_NOchat. Further, we observed that both citizens and migrants in Ulti_chat earned the highest income compared to all other treatments (see Table 3). To investigate the statistical significance of these income differences, we employed two OLS estimations with one observation per individual (i.e. average income over all periods). Table 7 reports the results of these estimations. In both specifications, we tested Ulti_chat against the other treatments. In specification IIX, we included the Standard treatment to get a first picture of the results, while we exclude it in specification IX that controls for endowments and the group status (that does not exist in the Standard treatment). Specification IIX reports that income is marginally lower (at the 10 percent level) in Ulti_NOchat and Dict_NOchat compared to Ulti_chat. The income levels in Standard and Dict_chat do not differ significantly from Ulti_chat in this first estimation. The second specification (IX) paints a more elaborate picture: being a citizen on average increases income by 15.283 Taler compared to migrants; endowments of 10 and 15 Taler result in 2.288 Taler and 6.875 Taler higher income respectively compared to an endowment of 5 Taler. Controlling for initial endowments and group membership, in specification IX we indeed find that average income in Ulti_chat is significantly greater than in Ulti_NOchat (at the 5 percent level), Dict_chat (at the 10 percent level) and Dict_NOchat (at the 5 percent level). We therefore report

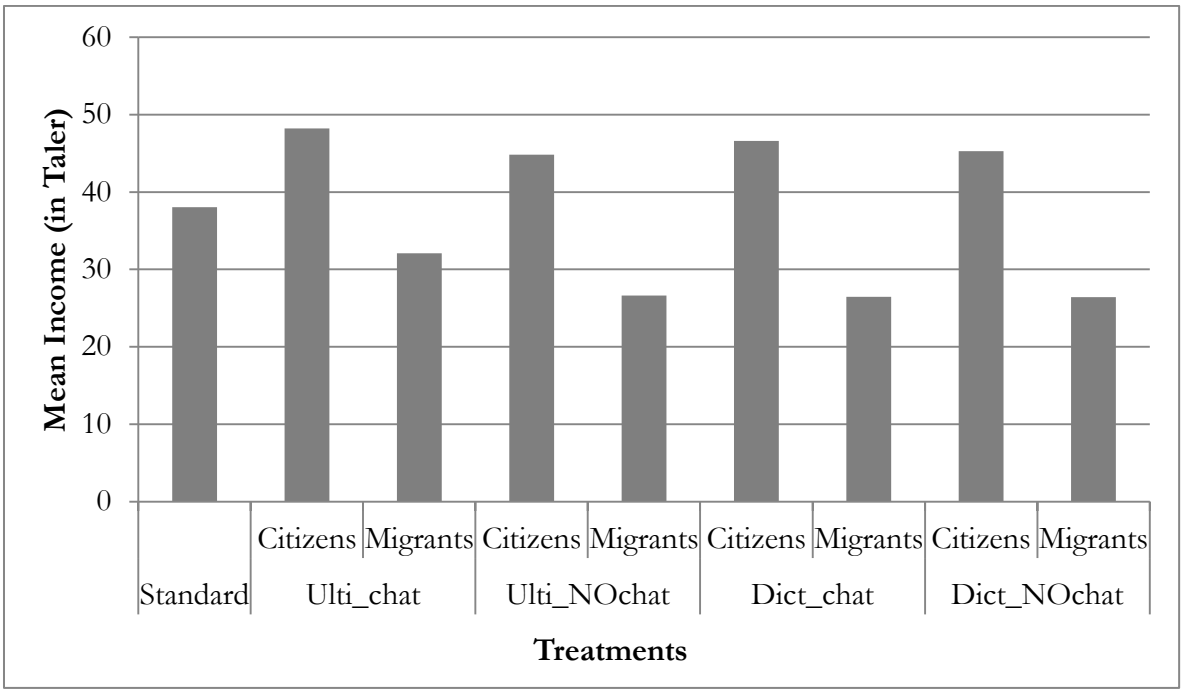
Result 7. *Ulti_chat achieves the greatest welfare of all treatments. Both citizens and migrants are better off compared to all other treatments.*

Table 7. Linear Regressions of Income, all Players and Periods.

Independent Variable	Dependent Variable: Average Income	
	IIX All treatments	IX Without Standard treatment
Standard	-2.134 (2.048)	
Ulti_NOchat	-4.438* (2.359)	-4.438** (1.733)
Dict_chat	-3.615 (2.632)	-3.615* (2.023)
Dict_NOchat	-4.295* (2.456)	-4.295** (1.820)
Citizen		15.283*** (1.472)
Endowment15		6.875*** (1.109)
Endowment10		2.288* (1.183)
Constant	40.155*** (1.816)	30.986*** (1.855)
Observations	270	240
Individuals	270	240
Groups	50	40

Note: OLS estimations with robust standard errors. An observation is the average income of an individual over all twelve periods. The 'standard' treatment is excluded in specification IX. The baselines are 'Ulti_chat' for treatment effects and 'Endowment5' for effects regarding the size of the initial endowments. Standard errors in parentheses. Significance: *p < 0.10, **p < 0.05, ***p < 0.01.

Figure 7. Mean Income over all Periods, by Citizens and Migrants.



3.4 Understanding Decision Making better with Chat and Survey Data

Before we discuss implications of our results for policy, we further investigate our experiment data. We will take a closer look at the chat entries in Ulti_chat and Dict_chat and ex-post survey answers to explore insights into the emergence of differences between these treatments. This analysis holds the potential to explain or substantiate observations from the quantitative analysis. Moreover, such evidence could be useful to construct hypotheses about the reasons behind certain behavioral patterns. Our quantitative analysis shows that the chat function has a significant effect on the minimum requirement setting for migrants to join the group in Dict_chat. In the debates before voting on the bar, we find notions of normative drivers for policy setting. Some subjects referred to equality and solidarity as reasons for specific policy setting levels. Few subjects also made reference to 'punishment' of the migrants or protection from (financial) exploitation as the basis for increased immigration requirements.

We closely examine the chat data for each group over the course of the experiment to explore the arguments leading to the minimum requirement setting and to identify potential differences in reasoning between Ulti_chat and Dict_chat. The analysis outlines different argumentative frames. Here, we are interested in all the arguments for or against high or low immigration requirements. Further, we are interested in the most dominant arguments in group consensus building. The profit maximization argument was the most dominant argumentative frame across most groups and both treatments. We also observe some instances of intuitive reasoning ('the smaller the group the better, right?', 'this feels right'), especially in the first chat.

In Ulti_chat, we additionally find evidence for discussions on the potential deterrence effects of high immigration requirements. High requirements make it impossible for some migrants to join and even some that can join may be deterred by high requirements. Similarly, we find occasional arguments about fairness, solidarity and generosity in Ulti_chat. However, our hypothesis is that

the deterrence effect by itself is not perceived to be a significant factor in setting the policy. This is suggested by the quantitative similarities in setting the bars between Ulti_chat, Ulti_NOchat and Dict_NOchat. Rather, when migrants hold some bargaining power in Ulti_chat in combination with a debate, this motivates citizens to contribute more to the public good (i.e. in accordance with the norm they set for migrants and different from all other treatments) and refrain from setting a high bar (compared to Dict_chat).

Table 8. Regressions Explaining Perceived Fairness of the First Bar.

Independent Variable	Dependent Variable: Perceived Fairness (on a five-point scale)	
	XII	XIII
	OLS	Tobit
Size of first Bar (in Taler)	-0.093**	-0.137***
	(0.035)	(0.047)
Ulti_NOchat	-0.692**	-1.083**
	(0.327)	(0.485)
Dict_chat	-0.536*	-0.751*
	(0.293)	(0.440)
Dict_NOchat	-0.317	-0.541
	(0.275)	(0.412)
Citizen	0.405*	0.663**
	(0.232)	(0.335)
Endowment15	0.095	0.156
	(0.237)	(0.351)
Endowment10	0.039	-0.048
	(0.269)	(0.386)
Constant	3.808***	4.179***
	(0.237)	(0.423)
Observations	235	235
Individuals	235	235
Groups	40	40

Note: OLS and Tobit estimates with robust standard errors clustered at the group level. We employ the Tobit estimation with a lower limit of 1 and an upper limit of 5. The 'standard' treatment is excluded. The baselines are 'Ulti_chat' for treatment effects and 'migrant' for group membership effects. Five observations are missing because of incomplete survey answers. Robust standard errors in parentheses. Significance: *p < 0.10, **p < 0.05, ***p < 0.01.

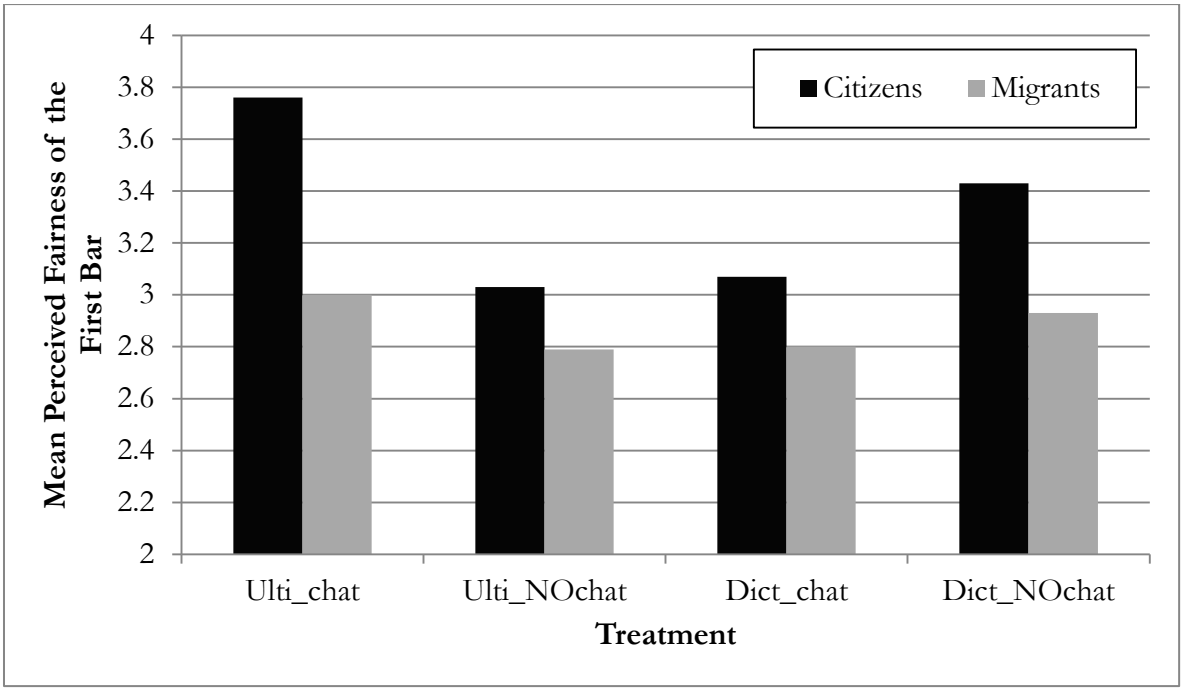
Furthermore, these findings are supported by the ex-post survey answers. We asked citizens and migrants to rate how fair they considered the first minimal transfer on a five-point scale [17]. We only asked for the *first* bar in order to avoid confounding answers on the average of all bars which would have been harder to analyze. Figure 8 depicts the mean perceived requirement fairness levels for the four treatments with migration requirements for both citizens and migrants. Overall fairness levels amounted to 3.379 points in Ulti_chat, 2.915 points in Ulti_NOchat, 2.932 points in Dict_chat and 3.186 points in Dict_NOchat. In order to separate drivers of perceived fairness, we employ OLS and (as a robustness check) Tobit estimations. Table 8 reports the results of these estimations in which we control for the size of the first bar in the respective group, treatment effects, whether the answer comes from a citizen or a migrant, and endowment effects.

As may be expected, ceteris paribus a higher bar (minimum contribution level) yielded lower fairness perceptions of the bar. We found that, on average, a one Taler increase in the minimum requirement yielded a reduction of 0.09 fairness points (significantly different from zero at the 5 percent level, OLS estimation). Furthermore we observe that, on average, citizens regarded the same bar 0.4 points fairer compared to migrants (significantly different from zero at the 10 percent level, OLS estimation). More surprisingly, we find that the perceived fairness about the first bar was significantly greater in Ulti_chat compared to Ulti_NOchat (at the 5 percent level) and Dict_chat (at the 10 percent level). Perceived fairness of the bar was also lower in Dict_NOchat compared to Ulti_chat, but not significantly so. We summarize

Result 8. *The chat in Ulti_chat contained debate about fairness towards and possible deterrence of migrants. Perceived fairness of the first bar (minimum contribution level) was greatest (and in 2 of 3 cases significantly) in Ulti_chat compared to the other three treatments.*

[17] Throughout the experiment we used language that was as neutral as possible, e.g. 'minimum transfer' instead of 'immigration requirement'. See appendix B for experiment instructions.

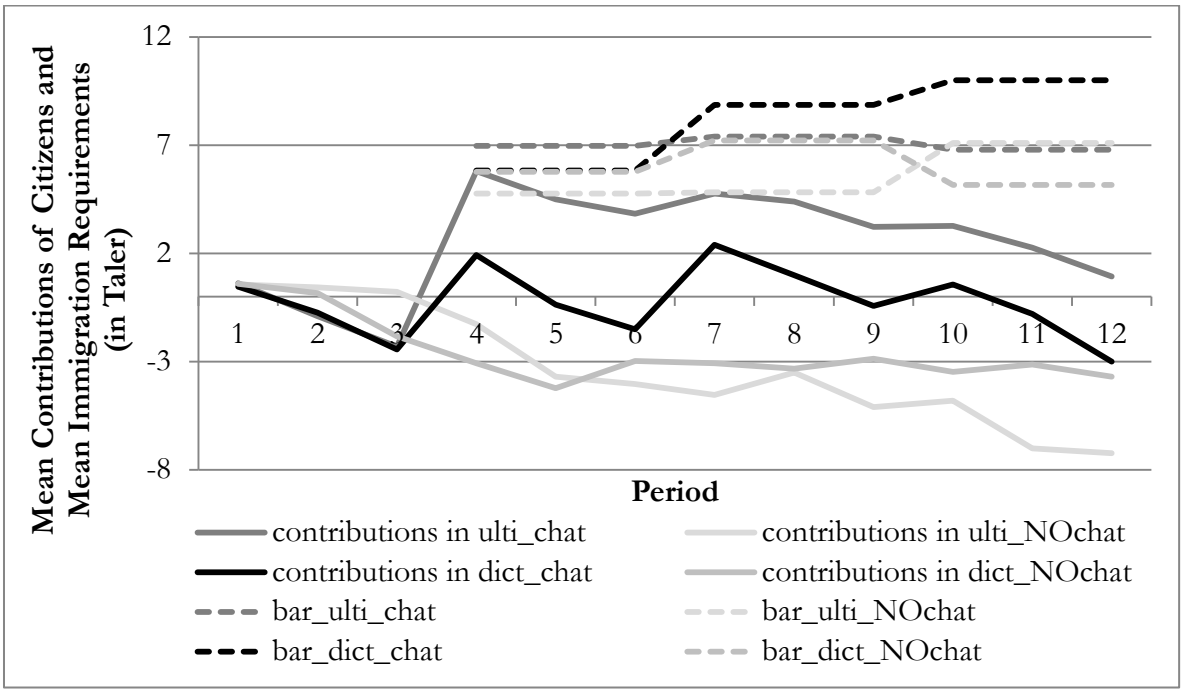
Figure 8. Mean Perceived Fairness of the *First* Bar, by Citizens and Migrants.



What drives Result 8? The result does not appear to be motivated by a lower mean requirement (more liberal immigration policy) in Ulti_chat (see Figure 5 and Table 5). Rather, we compare a citizen's contribution in a given period and the vote she casts in the decision-making on the requirement valid in that period. Naturally, these two decisions were made by the same individual and are therefore not independent from each other. We employ Wilcoxon signed-rank tests to compare whether the contributions and demanded requirements differed from each other. This test is depicted by the difference between solid and the dashed lines in Figure 9. Examining periods 4 to 12 and each treatment individually, we find that in Ulti_NOchat, Dict_chat and Dict_NOchat, citizens' contributions and citizens' demands differed in the vast majority of periods and at the 1 percent level. The only exceptions were period 4 (no significant difference) and period 5 (significant at the 5 percent level) in Dict_chat. Conversely, in periods 4 to 10 in Ulti_chat, there was no significant difference between citizens' contributions and their individual

demands. Only in periods 11 and 12, we find differences at the 5 and 1 percent level respectively, probably driven by the experiment coming to an end.

Figure 9. Public Good Provision over Time: Requirements and Citizens only.



This final analysis is key for understanding the results of our experiment. Only in Ulti_chat, citizens showed coherence between what they demand from migrants to contribute to the public good and their own contributions. This finding is the fundamental insight that drives Results 2, 6 and 8 presented above. Compared to all other treatments, in Ulti_chat, citizens contributed more to the public good in order to achieve fairness of the requirement. In appreciation of this fairness, voluntary contributions by migrants tended to be higher in Ulti_chat. Consequently, the public good got nurtured and yielded higher payoffs for both citizens and migrants. When asked about the fairness of the requirement, it was rated most fair in Ulti_chat as a result of this coherence. We shall call this mechanism *migration policy coherence*. In the next section, we will discuss the implications of our experimental results for immigration requirements.

4 Discussion

In this section, we discuss our main results and suggest potential implication for immigration policy making. How does public debate and varying perception of migration influence economic immigration requirements in a labor demand context?

Generally, we find that immigration requirements are higher than mean contributions of citizens. Although this finding seems intuitive, we note that, expect in one particular scenario, citizens expect more than they deliver. This finding could be interpreted as a form of in-group favoritism (see Tajfel et al. 1971; Billig and Tajfel 1973). As a real-world comparison, we observe that immigration requirements, such as income or sociocultural requirements often exceed population averages.

Furthermore, we find that public debate does not necessarily lead to lower immigration requirements due to fairness or solidarity group preferences. We do not observe a lower immigration requirement in perceived high-potential migration scenarios (Ulti_ treatments). In fact, when public debate was possible, immigration requirements were higher in cases with perceived low-potential migration. Public debate as such can be a double-edged sword. The opportunity to debate can increase citizens' contributions to the public good and facilitate in-group cooperation and solidarity (e.g. in Ulti_chat). However, the findings also suggest that it can be used to set disproportionately restrictive immigration requirements in order to maximize profits while keeping citizens' individual contribution levels low. Hence, policy makers aiming to stimulate labor demand should consider the implications of framing the potential of future migration in discourse, especially in light of persisting negative perceptions of past migration flows.

Our results suggest a relative rather than an absolute conception of policy fairness. Fair immigration requirements are often assessed by the extent to which immigrants are excluded. Following this understanding, high immigration requirements indicate unfair policy. Our results,

however, suggest that fairness could be conceived as a relative concept described by the difference between the immigration requirement and in-group averages. We define the relationship between policy requirements and in-group averages as *migration policy coherence*. Greater migration policy coherence leads to higher fairness perception towards the policy, higher voluntary contributions of migrants and, in return, higher overall welfare of citizens and migrants.

As one possible explanation, we propose that citizens consider 'high-potential' immigrants as equal. As a consequence, citizens adhere to the policy that they set for outsiders. This explanation must be seen in reference to the general phenomenon of in-group favoritism and individuals' common desire to maintain a positive group identity. Thus, citizens themselves comply with the immigration requirements that they enforce for migrants because discriminating 'equal' potential members of the group contradicts a positive group identity. Immigration requirements become a social norm for the in-group as well. We assume that higher perceived potential of migration leads to a debate among citizens which encourages their individual contributions to the public good and establishes an incentive to adhere to requirements set for migrants.

In sum, we conclude that perceived high-potential migration flows in combination with public debate induce the greatest *migration policy coherence*. Stressing the benefits and contributions of migration, facilitating high skilled migration and boosting socioeconomic integration of migrants could be strategies to promote a more positive debate on migration.

5 Conclusion

Some OECD countries have seen a restrictive trend regarding immigration requirements. In contrast, population aging will most likely lead to an increase in labor demand in many sectors. Policy makers have to look for ways to reconcile public opposition to immigration with a growing need to attract more immigrants.

Due to the (legal) complexity of immigration policies and cross-country and cross-time variation, most empirical studies are inherently context-specific. For these reasons, we apply experimental methods to gain some context-independent insights into a number of potential underlying determinants of immigration policy setting. We decided to select two dimensions of immigration policy for our experiment: perception of migration and public debate on immigration. We find that how a certain debate about immigration is framed within a public discourse (regardless of the real potential of migration) can have serious effects on the 'restrictiveness' of policies. Public debate can lead to the introduction of high immigration requirements in light of low perceived migration potential. Conversely, public debate can also encourage low immigration requirements if immigration is perceived to be of high potential. The latter is marked by what we define '*immigration policy coherence*' – the convergence of the immigration policy (what is expected of others) and population averages (the performance of the in-group). Greater immigration policy coherence leads to higher perceived fairness of the policy, higher citizens' contributions to the public good, high voluntary contributions of migrants and higher overall welfare measured by average individual profits.

We propose a possible explanation for this finding: In a context of perceived high-potential immigration, citizens consider immigrants as being equal. Thus, citizens themselves comply with the immigration requirements that they enforce for migrants. Immigration requirements become a social norm for the in-group's actions. Conversely, we have seen that discounting the potential of migration can lead to more restrictive immigration requirements and lower contributions from both citizens and migrants. Stressing the benefits and contributions of migration, facilitating high skilled migration and boosting socioeconomic integration of migrants could be strategies to promote a more positive perception of migration.

Our results indicate that immigration requirements that are closer to population means can lead to a greater perceived fairness of the policy and, in return, higher contributions from both

citizens and migrants. Our study has shown that policy 'fairness' is not measured by the absolute exclusion of immigrants. Rather a high level of *migration policy coherence* as a relative concept is a good indicator of fair and efficient immigration requirements.

Naturally, our study does not reflect nearly all facets of immigration policy. There is a need for further research and we hope to motivate further experimental studies in this area. There are numerous set-up alternatives that may be considered in the future. For example, one may consider a debate between citizens and migrants, countries which compete for high-endowed migrants, and naturalization of migrants after a certain time period. Such factors could provide further valuable insights into the drivers of immigration policy.

References

Ahn, T.K., R.M. Isaac and T.C. Salmon (2008). "Endogenous Group Formation". *Journal of Public Economic Theory*, vol. 10, pp. 171-194.

Ahn, T.K., R.M. Isaac and T.C. Salmon (2009). "Coming and going: Experiments on endogenous group sizes for excludable public goods". *Journal of Public Economics*, vol. 93, pp. 336-351.

Bauböck, R. and C. Joppke (2010). *How liberal are citizenship tests?*. EUI Working Papers 41. EUDO Citizenship Observatory.

Billig, M.G. and H. Tajfel (1973). "Social categorization and similarity in intergroup behavior". *European Journal of Social Psychology*, vol. 3, pp. 27-52.

Brekke, K.A., K.E. Hauge, J.T. Lind and K. Nyborg (2011). "Playing with the good guys: A public good game with endogenous group formation". *Journal of Public Economics*, vol. 95, pp. 1111-1118.

Brosig, J., J. Weimann and A. Ockenfels (2003). "The Effect of Communication Media on Cooperation". *German Economic Review*, vol. 4, pp. 217-241.

Brubaker, R. (2001). "The return of assimilation? Changing perspectives on immigration and its sequels in France, Germany, and the United States". *Ethnic and Racial Studies,* vol. 24, pp. 531-548.

Buckley, E. and R. Croson (2006). "Income and wealth heterogeneity in the voluntary provision of linear public goods". *Journal of Public Economics*, vol. 90, pp. 935-955.

Bundesagentur für Arbeit (2011). "Perspektive 2025: Fachkräfte für Deutschland". Available at http://www.arbeitsagentur.de.

Carrera, S., E. Guild and K. Groenendijk (2009). *Illiberal Liberal States. Immigration, Citizenship and Integration in the EU*. Surren: Ashgate.

Chaudhuri, A. (2011). Sustaining cooperation in laboratory public goods experiments: a selective survey of the literature. *Experimental Economics*, vol. 14, pp. 47-83.

Chan, K.S., S. Mestelman, R. Moir, and R.A. Muller (1999). "Heterogeneity and the voluntary provision of public goods". *Experimental Economics*, vol. 2, pp. 5-30.

Cherry, T.L., S. Kroll, and J. Shogren (2005). "The impact of endowment heterogeneity and origin on public good contributions: Evidence from the lab". *Journal of Economic Behavior & Organization*, vol. 57, pp. 357-365.

Cinyabuguma, M., T. Page and L. Putterman (2005). "Cooperation under the threat of expulsion in a public goods experiment". *Journal of Public Economics*, vol. 89, pp. 1421-1435.

Coricelli, G., D. Fehr and G. Fellner (2004). "Partner Selection in Public Goods Experiments". *Journal of Conflict Resolution*, vol. 48, pp. 356-378.

Dufwenberg, M. and G. Kirchsteiger (2004). "A theory of sequential reciprocity". *Games and Economic Behavior*, vol. 47, pp. 268-298.

Ehrhart, K.-M. and C. Keser (1999). "Mobility and Cooperation: On the Run". CIRANO Working Paper.

European Union (2009). "Council Directive 2009/50/EC of 25 May 2009 on the conditions of entry and residence of third-country nationals for the purposes of highly qualified employment". Available at http://eur-lex.europa.eu/.

Falk, A. and U. Fischbacher (2006). "A theory of reciprocity". *Games and Economic Behavior*, vol. 54, pp. 293-315.

Goodman, S.W. (2010). "Naturalisation Policies in Europe: Exploring Patterns of Inclusion and Exclusion". *EUDO Citizenship Observatory*.

Groenendijk, K. (2011). "From Assisting to Requiring Integration: Selective Citizenship Policies in the Netherlands". In: OECD: *Naturalisation: A passport for better integration of immigrants?*, Chapter 15.

Gunnthorsdottir, A., R. Vragov, S. Seifert and K. McCabe (2010). "Near-efficient equilibria in contribution-based competitive grouping". *Journal of Public Economics*, vol. 94, pp. 987-994.

Gürerk, Ö., B. Irlenbusch and B. Rockenbach (2006). "The Competitive Advantage of Sanctioning Institutions". *Science*, vol. 312, pp. 108-111.

Gürerk, Ö., B. Irlenbusch and B. Rockenbach (2011). *Voting with Feet – Community Choice in Social Dilemmas*. Working paper.

Healy, C. and D. Reichel (2013). "Earning Rights: Economic Status and Access to Citizenship". *ICMPD Working Paper* 05.

Home Office (2012). "Radical immigration changes to reform family visas. Securing borders and reducing immigration". https://www.gov.uk/.

Joppke, C. (2007). "Beyond National Models: Civic Integration Policies for Immigrants in Western Europe". *West European Politics*, vol. 30, pp. 1-22.

Joppke, C. (2004). "The retreat of multiculturalism in the liberal state: Theory and Policy". *The British Journal of Sociology*, vol. 55, pp. 237-257.

Khadjavi, M. and A. Lange (forthcoming). "Doing Good or Doing Harm – Experimental Evidence on Giving and Taking in Public Good Games". *Experimental Economics*.

Kolodziej, D. (2012). "Fachkräftemangel in Deutschland. Statistiken, Studien und Strategien." *Wissenschaftliche Dienste des Deutschen Bundestages*, Infobrief WD 6 – 3010-189/11, Berlin 2012.

Ledyard, J.O. (1995). "Public Goods: A Survey of Experimental Research". In: Kagel, J.H. and A.E. Roth (eds.), *Handbook of Experimental Economics*. Princeton: Princeton University Press, pp. 111-194.

Massey, D.S. and K.E. Espinosa (1997). "What's Driving Mexico-U.S. Migration? A Theoretical, Empirical, and Policy Analysis". *American Journal of Sociology*, vol. 102, pp. 939-999.

Mayda, A.M. (2006). "Who is against immigration? A cross-country investigation of individual attitudes toward immigrants". *The Review of Economics and Statistics*, vol. 88, pp. 510-530.

Meier, S. (2007). "A Survey of Economic Theories and Field Evidence on Pro-Social Behavior". In: Frey, B.S. and A. Stutzer (eds.), *Economics and Psychology – A Promising New Cross-Disciplinary Field*. Cambridge: MIT Press, pp. 51-87.

OECD (2012a). "International Migration Outlook 2012", *OECD Publishing*.

OECD (2012b). "Settling In: OECD Indicators of Immigrant Integration 2012". *OECD Publishing*.

Ostrom, E., J. Walker and R. Gardner (1992). "Covenants with and without a sword: self-governance is possible". *American Political Science Review*, vol. 86, pp. 404-417.

Page, T., L. Putterman and B. Unel (2005). "Voluntary association in public goods experiments: reciprocity, mimicry and efficiency". *The Economic Journal*, vol. 115, pp. 1032-1053.

Pascouau, Y., H. Labayle (2011). "Conditions for family reunification under strain. A comparative study in nine EU member states". Available at http://www.epc.eu/.

Rabin, M. (1993). "Incorporating Fairness into Game Theory and Economics". *The American Economic Review*, vol. 83, pp. 1281-1302.

Ruhs, M. (2008). "Economic research and labour immigration policy". *Oxford Review of Economic Policy*, vol. 24, pp. 403-426.

Sadrieh, A. and H. Verbon (2006). "Inequality, cooperation, and growth: An experimental study". *European Economic Review*, vol. 50, pp. 1197-1222.

Scheve, K.F. and M.J. Slaughter (2001). "Labor Market Competition and Individual Preferences over Immigration Policy". *The Review of Economics and Statistics*, vol. 83, pp. 133-145.

Tajfel, H., M.G. Billig, R.P. Bundy and C. Flament (1971). "Social categorization and intergroup behavior". *European Journal of Social Psychology*, vol. 1, pp. 149-178.

van Dijk, F., J. Sonnemans, and F. van Winden (2002). "Social ties in a public good experiment". *Journal of Public Economics*, vol. 85, pp. 275-299.

van Oers, R., E. Ersbøll and D. Kostakopoulou (2010). *A Re-definition of Belonging? Language and Integration Tests in Europe*. Leiden; Boston: Martinus Nijhoff.

Appendix A – Figures and Tables

Figure A.1a. Extensive Form of our Game in a Simplified 2-player Case, Ulti_ treatments.

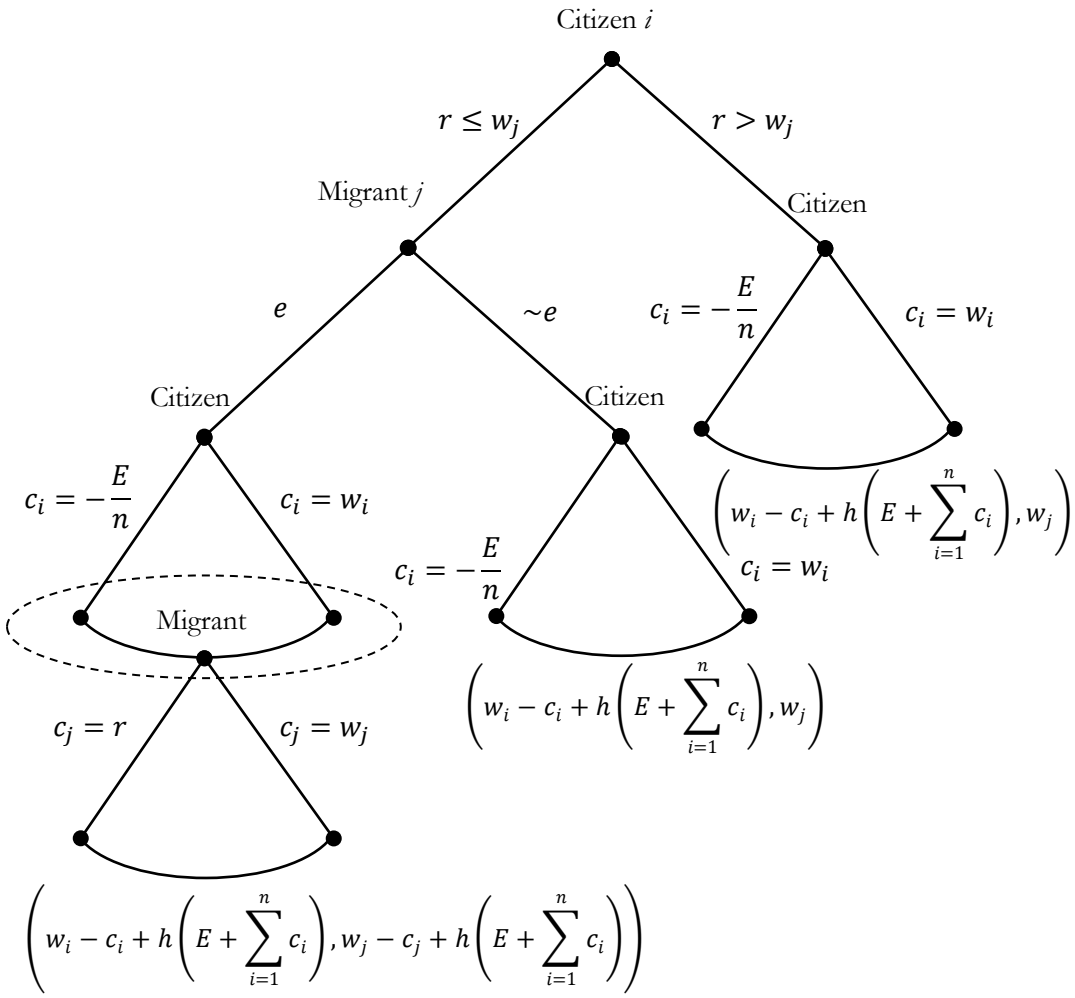


Figure A.1b. Extensive Form of our Game in a Simplified 2-player Case, Dict_ treatments.

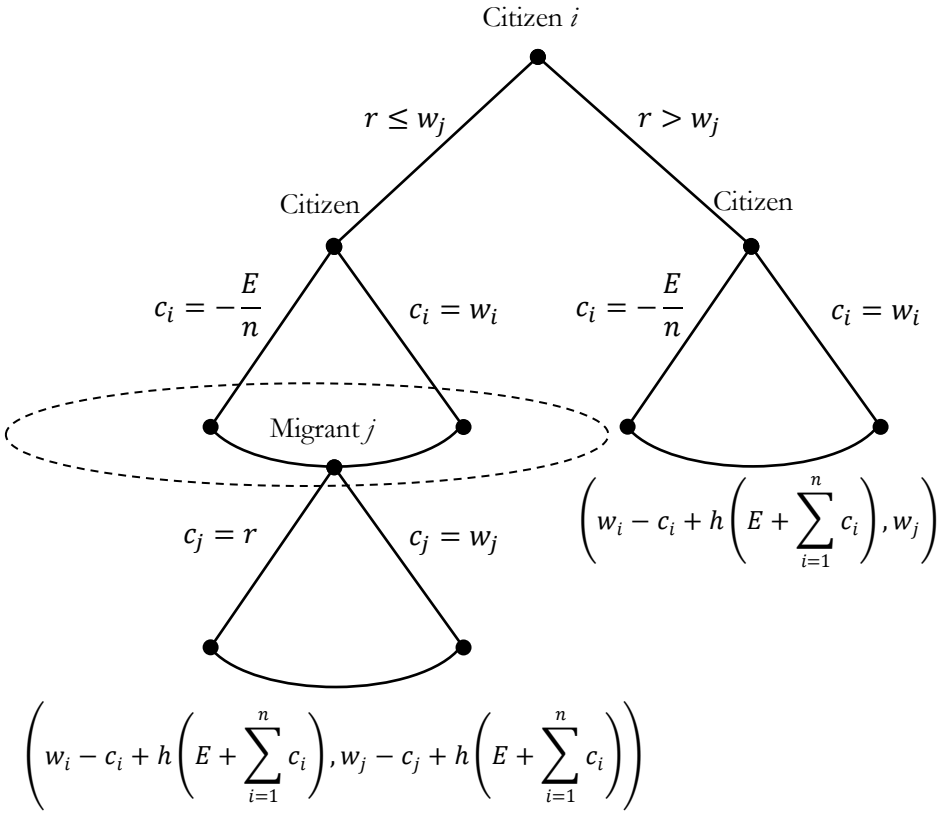


Table A.1. Test Statistics for Comparison of Group Contributions, all Players and Periods.

(row vs. column comparison)		Treatment			
		Dict_NOchat	Standard	Ulti_chat	Ulti_NOchat
Treatment	Standard	< (p = 0.0019)			
	Ulti_chat	> (p = 0.0343)	> (p = 0.0005)		
	Ulti_NOchat	= (p = 0.7624)	> (p = 0.0009)	< (p = 0.0588)	
	Dict_chat	= (p = 0.4057)	> (p = 0.0003)	= (p = 0.4497)	= (p = 0.1736)

Note: All test statistics are (nonparametric) Mann Whitney tests. One observation is the average group contribution of a group over twelve periods, yielding 10 independent observations per treatment. The table is to be read row vs. column. For instance, group contributions are significantly greater in *Dict_NOchat* compared to *Standard*.

Appendix B: English Translation of the Experimental Instructions

General Instructions for Participants

[Ulti_chat treatment instructions, translated from German. Original German instructions for all treatments are available from the authors upon request.]

Welcome to the Experiment Laboratory!

You are now taking part in an economic experiment. You will be able to earn a considerable amount of money depending on your decisions and the decisions of others. It is therefore important that you read these instructions carefully.

The instructions which we have distributed to you are solely for your private information. **It is prohibited to communicate with other participants during the experiment.** Should you have any questions, please raise your hand and an experimenter will come to answer them. If you violate this rule, we will have to exclude you from the experiment and from all payments.

During the experiment, you will make decisions **anonymously**. Only the experimenter knows your identity and your personal information is confidential. Your decisions will not be traceable to your identity.

In any case, you will earn 5 Euros for your participation in this experiment. The additional earnings depend on your decisions. During the experiment, your earnings will be calculated in tokens. At the end of the experiment, your earned tokens will be converted into Euros at the following exchange rate:

1 Taler = 0,20 €,

and they will be paid to you in **cash**.

The experiment consists of **12 periods** in which you always play the same game. The participants are divided into cohorts of 6 with two colors: 3 RED and 3 BLUE players. Hence, you will interact with 5 other participants. The composition of the cohort will remain the same for all 12 periods. Please note that you and all other participants decide anonymously. Therefore, cohort members will not be identifiable over the periods.

At the end of the experiments, you will receive your earning from **one out of the twelve periods** converted in Euros (according to the exchange rate above) in addition to the 5 Euros for your participation. The payout period will be determined **randomly**. You should therefore take the decision in **each** period seriously, as it may be determined to be the payout period.

The following pages describe the course of the experiment in detail.

Assignment to Colors, Endowments and Group-Membership

At the beginning of the experiment, colors will be randomly assigned to all players. You are either a RED or a BLUE player. This color will remain the same throughout the 12 periods of this experiment.

You will receive an endowment to your private account which is the same for all 12 periods. Your endowment can be 5, 10 or 15 Taler. This assignment is also done at random by the computer program. A 6-player cohort will be set up as follows:

In each cell there is always **exactly one player** of a 6-player cohort. The random assignment at the beginning of the experiment will remain the same for all 12 periods.		Color	
		RED player *(always group members)*	BLUE player *(may become group members)*
Endowment	5 Taler	1 Player	1 Player
	10 Taler	1 Player	1 Player
	15 Taler	1 Player	1 Player

All RED players are always members of the group. BLUE player are not members in the beginning of the experiment, but may become members depending on their own decision and the decisions of RED players. Further explanations will follow on the next pages.

Rules of the Experiment

Each group member (at the beginning, each RED player) needs to make the following decision. Your task (and the task of all other group members) is to decide on the transfer between your private account and a group account.

At the beginning of each of the 12 periods, each player receives an endowment of 5, 10 or 15 Taler in a **private account**. Moreover, there are **60 Taler** in a **group account**.

Each group member has to decide how many Taler to transfer from the private account to the group account **or** from the group account to the private account. Transfers may be between -10 and the respective initial endowment (either 5, 10 or 15 Taler, only whole numbers). If a group members types in a positive number, then she transfers Taler from her private account the group account. If the typed number is negative, then she transfers Taler from the group account to her private account.

All other players who are not group members (all BLUE players in the beginning of the experiment) make **no decisions** concerning the transfer between the private and the group account.

The Income of Group Members

The complete income of group members is constituted by two parts:

(1) the Taler which are in the private account after the transfer

(2) the **income from the group account**. The income from the group account is calculated as follows:

Your income from the group account =

0.5 *times* The sum of Taler in the group account

The income of a group member (in Taler) therefore is

(your initial endowment – your transfer) + 0.5*(the sum of Taler in the group account).

The income from the group account of all other group members is calculated using the same formula so that each group member receives the same income from the group account.

For instance, if the sum of transfers of all group members equals 10 Taler, then the group account holds 60 + 10 = 70 Taler. Accordingly, you (in case you are a group member) and all other group members receive an income from the group account of 0.5*70 = 35 Taler each. If you and the other group members transfer the sum of -3 Taler to the group account, then the group account holds 60-3= 57 Taler. You and all other group members receive 0.5*57=28.5 Taler each as income from the group account. For each Taler that you hold in your private account, you will receive 1 Taler.

The Income of Players who are not Group Members

Players who are not group members (in the beginning, all BLUE players) in a given period receive their initial endowment (either 5, 10 or 15 Taler) as income in that period. Beyond this income, such players receive **no income from the group account**.

Voting on the Minimal Transfer by BLUE Players

At the end of periods 3, 6 and 9 RED players are able to vote on the **minimal transfer** by BLUE players. This minimal transfer represents a **requirement for the group membership of BLUE players** and can be between -10 and 15 Taler. **It is not a requirement for RED players**. The group membership requirement is set such that a majority of RED players agrees with it (at least two out of three RED players). Before RED players vote on the requirement, they will be able to communicate for three minutes with each other via a chat.

Thereafter, each BLUE player may **decide** whether she accepts the minimal transfer and **becomes a group member**. Only BLUE players who hold initial endowments which are greater than or equal to the minimal transfer get the chance to decide. BLUE players with endowments that are lower than the minimal transfer **do not** get the chance to decide to become group members. If a BLUE player becomes a group member, in the following period, she is able to transfer Taler between her private account and the group account while observing the minimal transfer requirement. The requirement is **not binding** for RED players who will always be group members for all 12 periods.

Example 1:

Imagine that the three RED players decide on the following votes for the minimal transfer:

Player 1: -7 Taler Player 2: 12 Taler Player 3: -1 Taler.

This means that player 1 wants to introduce a minimal transfer of -7 Taler for BLUE players, while players 2 and 3 want to set the minimal transfer at 12 Taler and -1 Taler, respectively. In this case, the **minimal transfer** will be set at **"-1 Taler"** as two out of three RED players regard a minimal transfer of -1 Taler as acceptable. **All three BLUE players are then able to decide individually and in private** whether they want to accept the minimal transfer requirement. After their decisions, all players receive information on the number of members the group has from there on.

Example 2:

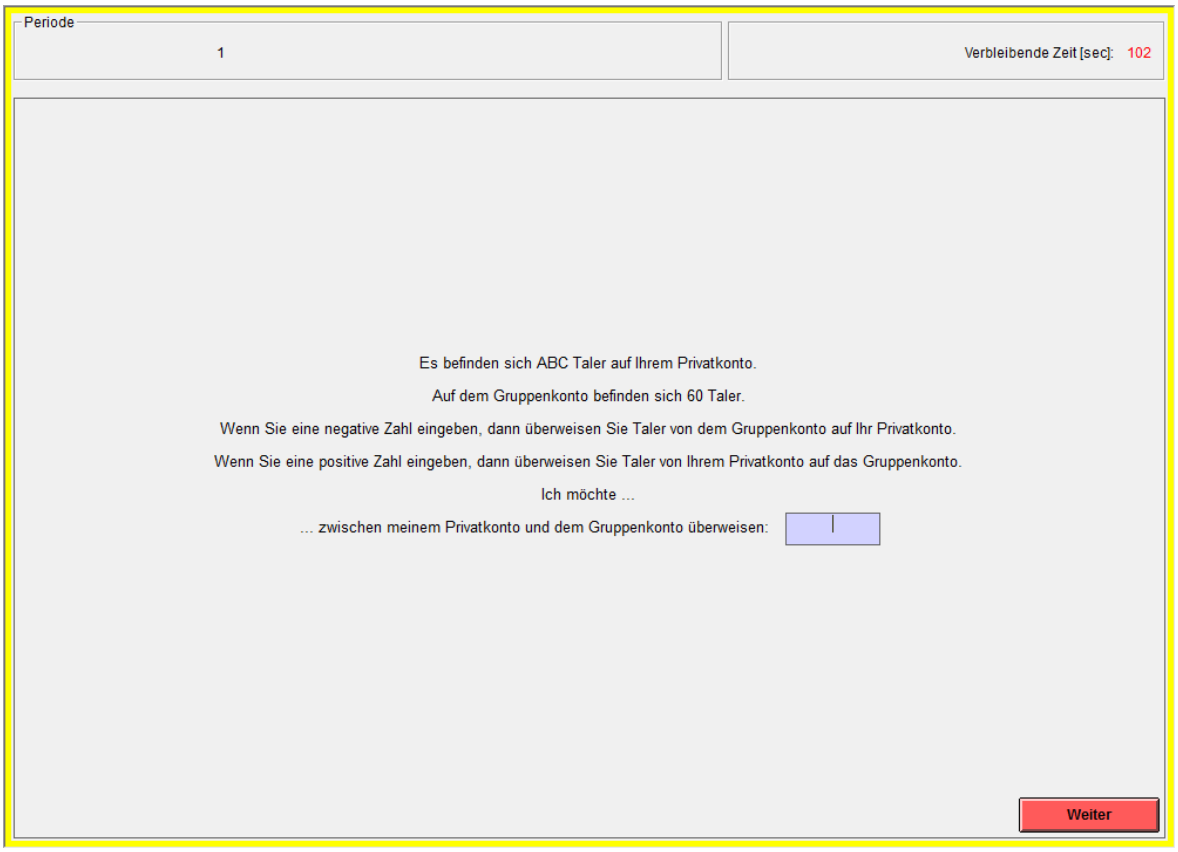
Imagine that the three RED players decide on the following votes for the minimal transfer:

Player 1: 11Taler Player 2: -10 Taler Player 3: 15 Taler.

In this example, the **minimal transfer** would be **“11 Taler”** as two out of three RED players regard 11 Taler as acceptable. In this example, the **two BLUE players** with endowments of 5 Taler and 10 Taler **cannot decide** to join the group as their endowments are **lower** than the minimal transfer requirement. The BLUE player with the endowment of 15 Taler can still decide to join the group while observing the minimal transfer requirement. After this decision, all players receive information on the number of members the group has from there on.

At the beginning of each period, all **group members** see a **decision screen**. Players who are **not** group members (at the beginning, all BLUE players) are **not able to make a decision**. The **period number** is shown in the left upper corner. The remaining **time** to make a decision is shown in the right upper corner.

The decision screen for group members is the following:

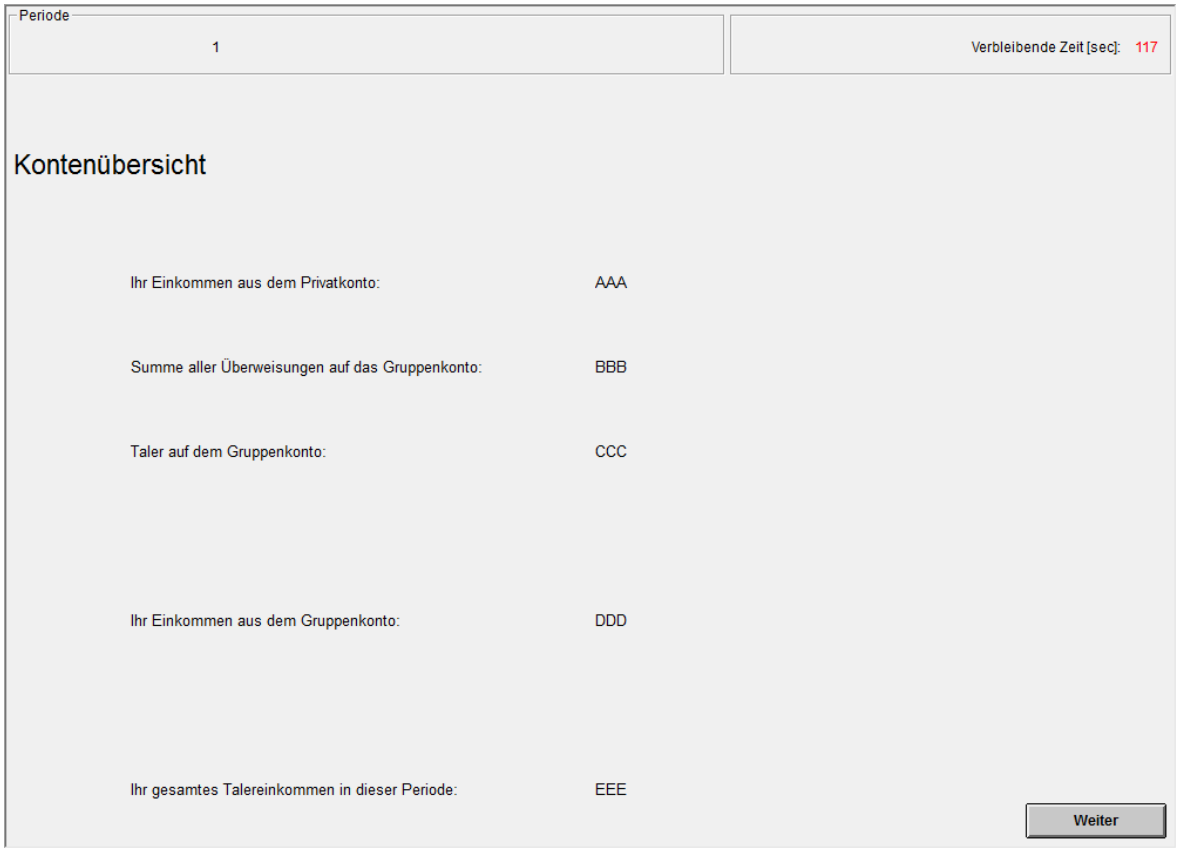


As described above, the group account holds **60 Taler** at the beginning of **every period**. You decide on your transfer by entering a whole number between -10 and your private endowment (5, 10 or 15 Taler) into the input window. You can click on this window with the computer mouse.

When you have entered your decision, you need to click the **continue button** (*German "Weiter-Taste"*) by use of the mouse. After you have clicked the continue button, your decision is final for that period.

After all group members have made their decisions, the account screen will inform you about the total number of Taler in the group account and your private account. Furthermore, you will be informed about your total income in this period.

The account screen:

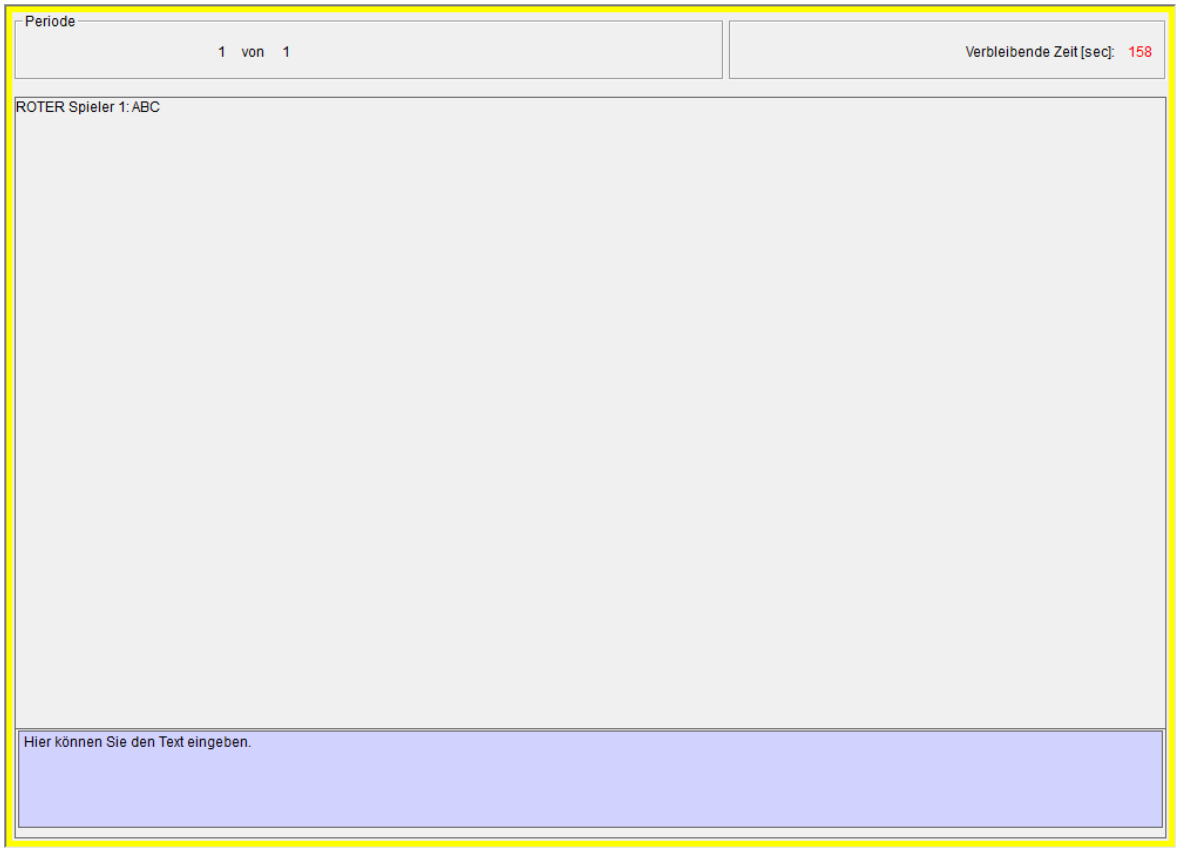


As described above, the total income of a group member consists of

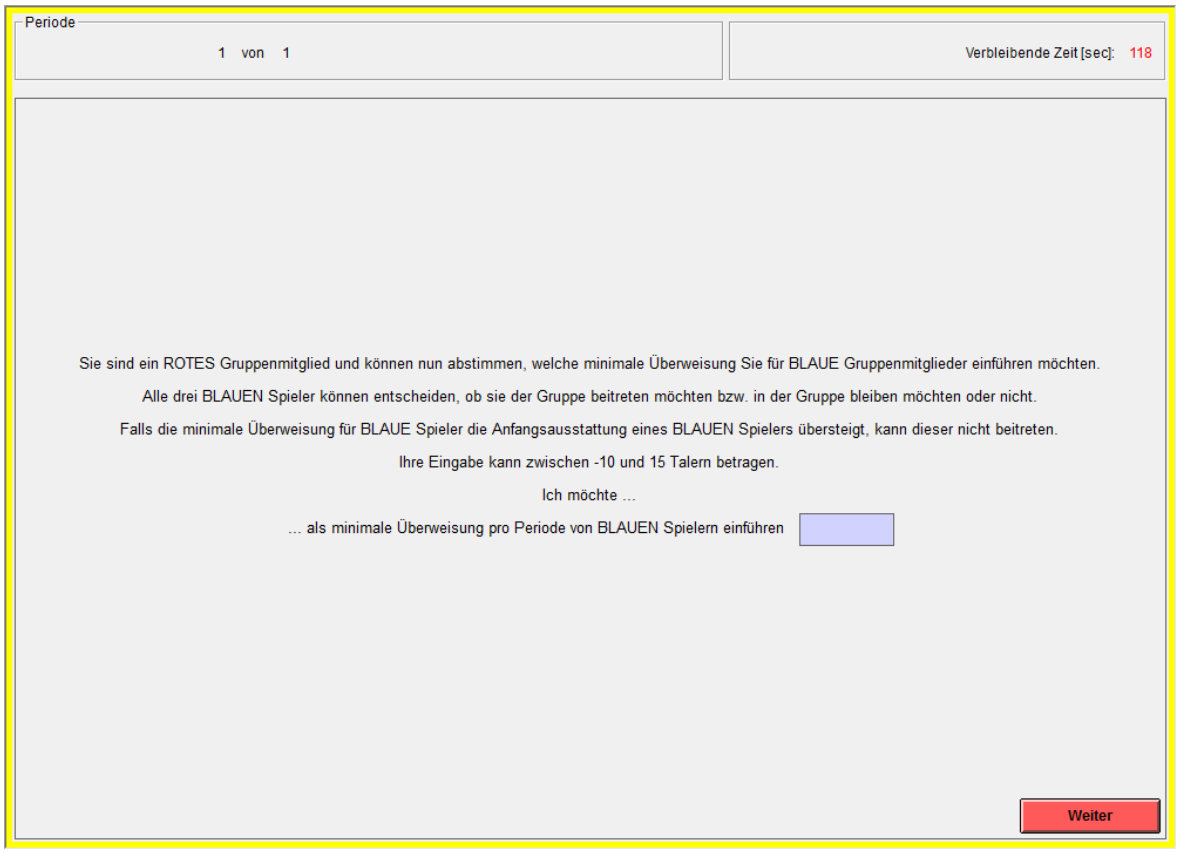
(your initial endowment – your transfer) + 0.5*(the sum of Taler in the group account).

Players who are **not group members** will receive their initial **private endowments** (that is 5, 10 or 15 Taler) in that period. Beyond the private endowment, those players do not receive any income from the group account.

At the end of periods 3, 6 and 9, RED players vote on a minimal transfer that BLUE players have to observe if they want to become or stay group members. Before RED players decide on their votes in private, they are able to chat with each other for three minutes. BLUE players do not participate in this chat and will not be able to read the messages. The chat screen:



The voting screen of RED players is the following:



Thereafter, BLUE players get the opportunity to become group members while observing the minimal transfer. Only BLUE players whose initial private endowment is equal or greater than the minimal transfer get the chance to become group members.

After BLUE players have made their decisions, all players, RED and BLUE, will receive information on how many players are members of the group from now on. The experiment then continues with the next period.

Before the experiment begins, all participants have to answer some control questions on the computer screen. These questions are designed to familiarize you with the rules of the experiment.

Do you have any questions concerning the experiment?