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Leveling up? An inter-neighborhood experiment on parochialism and the efficiency of multi-level public goods provision

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LEVELING UP?

AN INTER-NEIGHBORHOOD EXPERIMENT ON PAROCHIALISM AND THE EFFICIENCY OF MULTI-LEVEL PUBLIC GOODS PROVISION

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Abstract: Many public goods can be provided at different spatial levels. Evidence from social identity theory and in-group favoritism raises the possibility that when higher-level provision is more efficient, subjects' narrow concern for local outcomes could undermine efficiency. Building on the experimental paradigm of multi-level public good games and the concept of "neighborhood attachment," we conduct an artefactual field experiment with over 600 participants in a setting conducive to routine parochial behavior. In an inter-neighborhood intra-region design, subjects allocate an endowment between a personal, a local, and a regional public good account. The between-subjects design crosses two treatment dimensions: One informs subjects that the smaller local group consists of members from their own neighborhood, while the other varies the relative productivity at the two public goods provision levels. We find evidence for parochialism, but contrary to our hypothesis, parochialism does not interfere with efficiency: The average subject responds to a change in relative productivities at the local and regional levels in the same way, whether they are aware of their neighbors' presence in the small group or not. The results even hold for subjects with above-median neighborhood attachment and subjects primed on neighborhood attachment.

Keywords: Social identity; parochialism; multi-level public goods; artefactual field experiment.

JEL: C9, D7, H4

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1. Introduction

Public goods (PG) can be provided at different spatial levels. As a result, individuals often have to make a decision not just whether to contribute to PG, but how much to contribute at different levels: Should I contribute to wildlife conservation through donating to a local conservation area in my neighborhood when I could also contribute to wildlife conservation through a regional wildlife initiative? Should I give more support to my local public radio station – or more to the national network? In this "level problem," individuals need to come to a decision whether and how much to contribute at different levels, each involving groups of different size, spatial levels and differently sized benefits of contributing for others – and for oneself.

The multi-level public goods game (ML-PGG) is an extension of the standard PGG that experimental economists use to explore individual behavior in the level problem (Wachsman 2002, Wit and Kerr 2002, Blackwell and McKee 2003, Buchan et al. 2009, Güth and Sääksvuori 2012, Fellner and Lünser 2014, Chakravarty and Fonseca 2017).[1] While design details differ, the unifying feature of all ML-PGG is the nested structure of social dilemmas: Subjects can privately provide the PG in a smaller group at the lower level and in a larger group at the upper level, and all the smaller groups are fully contained within a larger group. This nested structure is what differentiates the ML-PGG from other extensions of the standard PGG to multiple PGs (e.g. Cherry and Dickinson 2008, Falk et al. 2013, McCarter et al. 2014)[2] and what allows the level problem to be captured by design. Implementing the ML-PGG design with two PG accounts in the laboratory has yielded two findings of importance to us. The first is that when contributions yield the same total benefits at both levels, then subjects, on average, contribute more to the lower level PG than to the higher level PG. The tendency to prefer the lower level PG has been interpreted as evidence suggestive of "localism." The second finding is that when the total benefits at the higher level exceed those at the lower level, however, individuals "level up:" They contribute significantly higher amounts to the higher level PG (Blackwell and McKee 2003, Fellner and Lünser 2014, Chakravarty and Fonseca 2017). In other words, laboratory ML-PGGs find little interference of "localism" with efficiency such as to create a "local bias."

[1] More recently, the ML-PGG has also been applied in quantitative biology to study the evolution of cooperation (Wang et al. 2011).

[2] ML-PGG designs so far capture the concurrence of PG dilemmas in two different ways. As in our design, one set of designs involves allocation tasks for an experimental endowment not just between a private and single group account, but between private and two group accounts that differ in group size, marginal per-capita return, and other structural features (Blackwell and McKee 2003, Buchan et al. 2009, Fellner and Lünser 2014, Chakravarty and Fonseca 2017). The other set of designs retains the standard allocation task between one private and one public account, but varies across treatments the degree of externalities that the public account generates to different groups (Engel and Rockenbach 2009, Güth and Sääksvuori 2012).

In this paper, we transfer the standard ML-PGG from the laboratory to an artefactual field setting[3] in which naturally grown nested structures foster local social identities through direct, neighborhood-based interactions. Our field setting allows us to investigate nested structures and locational identities typically encountered in non-sectarian, stable high-income democracies. Building on the existing ML-PGG literature, individuals in our experiment can provide a PG at two levels: the local level (the neighborhood in which the subject lives) and the regional level (the region in which all of the subjects' neighborhoods are located). Through controlled treatment variations, our experimental design implements different relative productivities of PG provision at the two levels and changes the awareness of a shared group attachment in the small (low level) group.

In our field setting with its nested structure, we expect subjects that are aware of this structure to routinely exhibit parochial concerns. In other words, when the shared neighborhood affiliation is easily observable in the level problem, subjects will tend to favor outcomes benefitting their own local group and attach lower weights to outcomes benefitting the larger group (in which the local group is nested). We refer to this tendency as routine "parochialism," i.e. an increased preference for "localism" that is detectable whenever beneficiaries of the lower level PG are aware that they share a common neighborhood affiliation.

Against this backdrop, we investigate the core question of this paper. This is whether the routine form of parochialism that we expect to find interferes with the efficiency of individuals' contribution decisions across the different levels. We dub such an interference effect a "parochial bias." The question of whether a parochial bias is present and substantial is important in the many policy situations in which the provision of public goods exhibits technical economies of scale over some relevant range. Such scale economies are a regular feature when communities need to decide at which level to provide public goods such as education (Brasington 2003), municipal services (Reingewertz 2012), fire services (Duncombe and Yinger 1993), and policing (Finney 1997). Experimentalists capture these scale economies in the ML-PGG by higher aggregate returns to contributing to spatially higher levels. In such settings, "leveling up," i.e. contributing more to the higher level, is in the interest of social efficiency (Buchan et al. 2009, Güth and Sääksvuori 2012, Chakravarty and Fonseca 2017). Conversely, behavioral mechanisms that impede "leveling up" impose a social cost. Parochialism, the object of our present study, is an obvious candidate for such an efficiency-impeding behavioral mechanism. This motivates our investigation into whether the presence of

[3] We follow the nomenclature of Harrison and List (2004) in this characterization.

a naturally grown social identity shared among a local subgroup of individuals engaged in a ML-PG provision problem leads to changes in contribution behavior that can unambiguously be judged to interfere with efficiency.

The study of parochialism relates to the recent interest in economics in individuals' social identity or sense of group attachment (Akerlof and Kranton 2000). Such attachment has been shown to have a significant impact on contribution decisions in the standard PGG. When subjects share a social identity through a shared group attachment, they tend to behave more cooperatively towards those they recognize as group members and less cooperatively towards outsiders.[4] Evidence for such in-group favoritism and out-group discrimination can sometimes be generated in standard PGGs in which the shared commonalities in the group are "minimal" (Tajfel and Turner 1979, Bernhard et al. 2006, Chen and Li 2009).[5] It is found most reliably in settings in which the shared social identity is naturally grown through direct social interaction (e.g. Charness et al. 2007, Goette et al. 2006) and can lead to potentially significant efficiency losses there (e.g. Bernhard et al. 2006, Ruffle and Sosis 2006). Our study shares with the literature on group attachment a focus on in-group favoritism, but differs on account of the nested architecture of the ML-PGG, which allows for multiple social identities. The nested structure features several in-groups of different size and distance to the contributor, but no out-group. In such a setting, social identity very well might, but need not, affect PG contributions and create a conflict between parochialism and efficiency.

As illustrated above, the ideal setting for parochialism to assert itself is one in which individuals exhibit attachment to naturally grown groups at a local, but not at a higher level. The affiliation of an individual to a neighborhood has a distinguished history in the literature as an identifier of attachment to a naturally grown group. It is a well-established component of social identity in social psychology and sociology. The subject of intensive research for at least forty years (see Lewicka 2011 for a survey), neighborhood attachment correlates with other measures of "local social capital," the intensity of neighborhood ties, and the level of involvement of subjects in informal social activities in the neighborhood (Ringel and Finkelstein 1991, Moser et al. 2002, Bonaiuto et al. 2003, Brown et al. 2003, Lewicka 2005). Correspondingly, the neighborhood has since been used in economics as an appropriate level at which to investigate parochialism in trust relationships (Falk and Zehnder 2013, Meier et al. 2016), PG provision (Marschall 2004), and social dilemmas in general (Falk et al. 2013). Neighborhood affiliation

[4] In a setting conducive to discrimination against outsiders, Daskalova (2017) shows that the tendency to discriminate is especially strong in case subjects decide collectively in groups sharing a common identity.

[5] "Minimal" groups are defined by a group identity constructed around an arbitrary membership criterion, such as assignment of a color or a shared taste in art (Turner et al. 1979).

is also a particularly meaningful concept in the present context because of the explicitly spatial nature of the ML-PG provision problem in our experimental implementation. Numerous PGs are provided at the neighborhood level and this is also true for the neighborhoods in our experiment: municipal districts in German cities, which are political entities that have their own neighborhood associations, their own physical infrastructure for social interaction such as community halls, and their own city council delegates. The concept of neighborhoods used in our experiment thus exhibits a direct connection to public decision-making in the real world. Attachment to one's neighborhood contrasts with that to one's region, the other level of PG provision implemented in our experiment. Emotional attachment to regions is generally weak (Lewicka 2011) because regions are considered by their inhabitants to be more abstract (Tuan 1975), spatially fuzzy (Laczko 2005), and often a product of government planning rather than natural historical developments (Paasi 2003). All of these characteristics apply to the region that is used as the higher provision level in our present experiment, thus ensuring the desired divergence in attachment compared to the neighborhood level.

Our experiment adopts a two-by-two design that can identify whether parochialism interferes with greater efficiency in the ML-PG. The first treatment dimension varies the awareness of shared group attachment through two conditions. In one, subjects learn that the small group contains only members of the subject's own neighborhood. In the other, they do not. The second treatment condition varies the relative productivities of PG provision at the local and regional levels by varying the marginal per-capita return (MPCR) of the regional PG. Together, this design allows us to make three distinct contributions: The first is to show how the role of naturally grown social identity can be experimentally manipulated and studied. In this, we go beyond artificially induced (Beekman et al. 2017), minimal (Blackwell and McKee 2003, Chakravarty and Fonseca 2017) and anonymous groups (Fellner and Lünser 2014), and beyond experiments that do not exogenously vary place attachment (Buchan et al. 2009). The second is the particular neighborhood-within-a-region setting, which provides a naturally grown multi-level structure. This allows us to examine how parochialism asserts itself at the local level. Our third contribution is a research design that answers the need for a randomized assignment of subjects to treatments in which *both* the salience of social identity and the relative contribution productivities in the ML-PGG differ. The need arises from our objective to identify whether social identity and efficiency (MPCR) interact negatively, thus resulting in a "parochial bias." This is not possible on the basis of existing evidence. Earlier experiments either vary the MPCR of one of the two PGs (Blackwell and McKee 2003, Fellner and Lünser 2014, Chakravarty and Fonseca 2017), vary the salience of the group affiliation at a constant MPCR (Chakravarty and

Fonseca 2017), or examine home-grown variations in group affiliation (Buchan et al. 2009). Closest to our setting, Beekman et al. (2017) conduct a laboratory experiment in which they induce conflicts between groups and vary the relative productivity in a ML-PGG. None of the previous studies implements the two-by-two design with naturally grown groups and randomized assignment that is required to test whether groups with a shared social identity at the local level respond less to changes in the MPCR than those without a shared social identity. Such a difference in response is what would clearly constitute evidence of a parochial bias that affects the overall efficiency of public goods provision in a nested structure.

Based on responses from 616 participants who decided online on the private provision of concurrent and perfectly substitutable public goods at two different levels, we report two main findings. First, we show that some of the results from lab-based ML-PGG experiments (Blackwell and McKee 2003, Fellner and Lünser 2014, Chakravarty and Fonseca 2017, Beekman et al. 2017) successfully transfer to our field setting with naturally grown groups. We reconfirm both the MPCR effect, which predicts that increasing the MPCR of the regional PG attracts higher contributions, and the inefficiency of level-wise allocation of private contributions to different PG levels: As the previous laboratory experiments, we find positive average contributions to the small group, even when the large group PG generates higher total benefits. Our second and main finding is that the strength of the MPCR effect does not differ significantly between those groups that do and those that do not observe the naturally grown social identity in the small group. Comparing treatments in which subjects were or were not aware that the small group consisted of their local neighbors, we find that in both conditions, contributions to the regional PG are significantly higher as the MPCR of the regional PG increases. Importantly, the size of this increase is not statistically smaller in the group in which neighborhood attachment is made public. In other words, in contrast to our definition of a "parochial bias," a higher efficiency of the regional PG was associated with a leveling up of contributions by subjects, and the leveling up was the same across treatment conditions, irrespective of whether subjects knew that the small group consisted of their neighbors. This finding is not due to the absence of routine parochialism in our experimental setting. When we focus our analysis on subjects with above-median neighborhood attachment and subjects that have been procedurally primed on their neighborhood attachment we find evidence for routine parochialism, i.e. a higher tendency to contribute to the local account when subjects are made aware that this account is shared with participants from their own neighborhood. In line with earlier studies, we thus find evidence for parochial preferences among subjects who display strong group attachment. In the context of our experiment, however, this form of routine

parochialism is not sufficiently strong to override efficiency considerations in the level problem. In other words, we have first evidence that the routine parochialism associated with nested PG provision problems in non-sectarian urbanized settings typical of high-income democracies need not imply substantial parochial bias. Whether this finding extends to settings with more than routine parochialism is an open question. It is conceivable that rural, low-income, and especially sectarian settings are a less benign environment for solving the level problem efficiently. This is particularly likely where stronger in-group/out-group features are superimposed onto the ML-PG structure of nested in-groups.

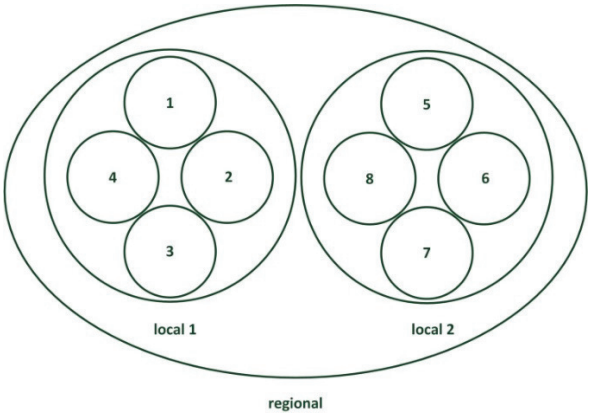
The rest of this paper is organized as follows: Section 2 describes the experimental design, presents our theoretical predictions, and contains a detailed description of the experimental protocol. We discuss the experimental results and robustness checks in Section 3. The last section provides a summary discussion of our main findings and concludes.

2. Experimental Design, Theoretical Predictions & Procedure

2.1. Experimental Design

Our experimental design implements a multi-level public goods game in which each subject is a member both of a small group consisting of four members and of a larger group of eight members. The larger group is composed of the small group of four plus an additional four members, who are all members of the other small group. In the parlance of ML-PGG, the smaller groups are therefore "nested" in the larger group, with two small groups of four making up one large group of eight (see, for example, Güth and Sääksvuori 2012). In keeping with that literature, we will repeatedly refer in the paper (but not the experimental instructions) to the small group and its PG as *local* and contrast that with the larger group and its PG being termed *regional*. Figure 1 illustrates the composition of groups.

Figure 1: Group composition



The decision task for subjects is to allocate an initial endowment across three different accounts: a private account that subjects retain for themselves, a PG that generates benefits to the member's local group only, and a PG that provides benefits to the entire regional group. Formally, we can express subject *i*'s payoff, π_i – given the contribution decisions of all remaining seven subjects, of which three are in subject *i*'s local group L_i and four in the other local group L_{-i} of which *i* is not a member – as follows

$$\pi_i = e - q_i^l - q_i^r + \alpha^l \sum_{j \in L_i} q_j^l + \alpha^r \sum_{j \in L_i \cup L_{-i}} q_j^r$$

where e denotes the initial endowment, q_i^l the contribution of subject i to the local public good, and q_i^r the contribution to the regional public good. α^l is the MPCR from the local public good and α^r denotes the MPCR from the regional public good. The respective MPCRs fulfill the standard requirements for a social dilemma, with $\alpha^l < 1$ and $4\alpha^l > 1$ for the local as well as $\alpha^r < 1$ and $8\alpha^r > 1$ for the regional group.

The treatment conditions and parametric implementation of the design are summarized in Table 1 for stage 1 of the experiment and Figure S.1 in the supplementary material provides a schematic diagram of the two-stage procedural implementation plus the number of subjects in each treatment. Table 1 shows that the experimental treatments vary along two dimensions, MPCR and social identity. We start with the two main MPCR conditions that vary the productivity of the regional PG. Subjects are randomly assigned to one of these conditions at the outset of the experiment and remain in the same MPCR condition until the end. As in Blackwell and McKee (2003), there are two MPCRs for the regional good while the MPCR for the local PG is always set at $\alpha^l = 0.5$. The total benefits (TB) of a one unit contribution to the local PG across the entire regional society of eight are therefore held constant at 2 units.[6] Condition LOW features a regional MPCR of $\alpha^r = 0.25$ and corresponding TB of 2. In condition LOW, therefore, the TB of the local and the regional PG are the same while the price of contributing is lower in the local PG.[7] Condition HIGH features an MPCR of $\alpha^r = 0.5$, a corresponding TB of 4, which is larger than the TB of the local good, but the same price of contributing.[8]

[6] With $\alpha^l = 0.5$, a contribution to the local PG of €1 by one subject generates €0.5 for four subjects in the local group only and therefore a total benefit of €2 for the entire group of eight.

[7] The price of giving for the individual contributor is the opportunity cost of contributing to the PG. At an MPCR of 0.5, the contributor receives €0.5 in PG for every €1, corresponding to a price of €0.5. At an MPCR of 0.25, the contributor only receives €0.25 and the price is €0.75.

[8] At $\alpha^r = 0.25$ ($\alpha^r = 0.5$), a contribution to the regional PG of €1 by one subject generates €0.25 (€0.5) for eight subjects in the regional group and therefore a total benefit of €2 (€4) for the entire group of eight.

Table 1: Main treatments, stage 1 – summary

Treatment	Local Public Good (LPG)			Regional Public Good (RPG)		
	#	α^l	TB^l	#	α^r	TB^r
LOW – NOLABEL	4	0.5	2	8	0.25	2
LOW – LABEL	4	0.5	2	8	0.25	2
HIGH – NOLABEL	4	0.5	2	8	0.5	4
HIGH – LABEL	4	0.5	2	8	0.5	4

The second treatment dimension, social identity, is implemented in two stages, corresponding to two consecutive decision tasks for each subject. In both stages, the treatment consists of whether subjects receive information that they share a group attachment with the members of the smaller and the larger group. The group attachment for the smaller group is residence in the same neighborhood; for the larger group, it is residence in the same region. The *neighborhoods* in the experiment are municipal districts, i.e. political entities with a typical population of several thousand inhabitants and an area of around five square kilometers that elect their own representatives to the city council. The *region* in the experiment is a metropolitan area straddling several states with a population of over two million and in which the neighborhoods are located. The region does not function as a political entity. In the condition *LABEL*, subjects learn that the small group contains three other individuals that reside in the subject's own neighborhood and that the large group contains those three plus four individuals that reside in the same region as the subject. Subjects assigned to the treatment condition NOLABEL, on the other hand, are neither informed that the three other members of the smaller group share a common neighborhood with the subject nor that individuals in the larger group reside in the same region. Jointly, the two treatment dimensions of MPCR and social identity allow us to identify how contributions in a ML-PGG respond to naturally occurring forms of social identity. To probe the results delivered by the main treatments, we investigate their robustness in a number of directions. Two of our robustness checks vary different aspects of our treatment conditions. The first robustness check relies on an additional treatment that varies the productivity of contributions to the RPG between members of the local group (neighbors) and the members from a different neighborhood (non-neighbors). In the HIGH condition of our main treatment, the MPCRs ($\alpha^l = \alpha^r = 0.5$) of the LPG and the RPG are equal and, consequently, contributing to the RPG generates additional benefits to non-neighbors at no cost to neighbors. An additional treatment called MIX creates a stronger trade-off between total group benefits in the RPG and benefits to the local group. In MIX we choose $\alpha^l = 0.5$ while the MPCR in the RPG differs for neighbors ($\alpha^{r,local} = 0.25$) and non-neighbors ($\alpha^{r,local} =$

0.75).[9] This differentiation of MPCRs between neighbors and non-neighbors does still create a situation in which the total benefits of contributing to the RPG are higher (4) than the total benefits of contributing to the LPG (2). We report the results of this additional treatment in section 3.3.

The second robustness check relies on a repetition of stage 1. This stage 2 is preceded by a priming task that borrows from the natural identity stimulation approach by Chen et al. (2014) and Li et al. (2017). There, subjects first complete a questionnaire that contains a set of seven questions about their neighborhood and their involvement in neighborhood activities to make subjects' local identity salient. Second, subjects fill in a short writing task in response to an open-ended question in order to gain a positive connotation of living in their neighborhood or the metropolitan area. Subjects were randomly assigned to one of two different versions of the open-ended question. Given our interest in parochial preferences, the analysis of stage 2 decisions uses observations from the majority of subjects (74 percent) assigned to the *local prime* version in which subjects list positive aspects of living in their specific neighborhood.[10] After completing the writing task, subjects take their stage 2 allocation decision. To determine final payoffs to subjects, the group decision of one regional group in one of the two stages was randomly selected and the corresponding pay-offs computed at the end of the experiment.[11]

2.2. Hypotheses

In a sequence of two one-shot ML-PGGs, purely selfish individuals are predicted to allocate their entire endowment to their private account in both decisions. Given the parameter choices of the design, this prediction holds for all four treatment conditions, irrespective of the level of the MPCR (LOW or HIGH) and of the social identity information (LABEL or NOLABEL). The behavior of the average subject in PGG experiments, however, is not consistent with the assumption of purely selfish preferences (Ledyard 1995, Zelmer 2003, Chaudhuri 2011). This also holds for behavior in the ML-PGG for which previous experiments have found that individuals exploit the free-riding opportunities present in the ML-PGG to a significantly lower degree than predicted in the standard Nash equilibrium of purely selfish players (Blackwell and McKee 2003, Güth and Sääksvuori 2012, Fellner and Lünser 2014).

The levels of cooperation observed in the ML-PGG can be traced back to well understood structural factors that explain cooperation in the linear PGG such as the MPCR. The conclusive

[9] In order to implement this treatment condition without deception, we have to create complementary local groups where the MPCR of contributions to the RPG is set to 0.75 for neighbors and 0.25 for non-neighbors. Individuals' contribution behavior in this sub-treatment is not investigated in this paper, participants are exclusively used to construct groups at the regional level.

[10] The remaining 26 percent of subjects were assigned to the *regional prime* version in which they listed positive aspects of living in the region.

[11] To prevent spillover or licensing effects, subjects are informed at the beginning of the experiment about these procedures.

evidence from the standard PGG that higher MPCRs induce higher contributions (Isaac et al. 1984, Zelmer 2003, Chaudhuri 2011) carries over to ML-PGG. Like in the standard PGG, a higher MPCR increases efficiency through a higher productivity and, at the same time, a lower price of giving (Andreoni and Miller 2002). Group size, another structural factor, has been shown to have either no or at best a slightly positive effect on contributions in experiments involving the standard PGG (Isaac et al. 1994, Nosenzo et al. 2015, Diederich et al. 2016). In light of these stylized facts, previous findings from the ML-PGG literature, which suggest that the small group receives higher average contributions when the total benefits from contributions to the small and the large group coincide (and hence the MPCR is larger for the LPG), are not in themselves evidence for the existence of parochialism (Blackwell and McKee 2003, Fellner and Lünser 2014, Chakravarty and Fonseca 2017). Instead, this observation may simply reflect that contributions in the PGG respond to the MPCR, but are largely irresponsive to group size. The finding that increasing the MPCRs for contributions to the larger-group PG leads to higher contributions (Blackwell and McKee 2003, Fellner and Lünser 2014) is also in line with these previous findings. Group size invariance can similarly explain the result that even at identical MPCRs for the smaller and larger group, contributions to the smaller group do not fall to zero (Blackwell and McKee 2003, Chakravarty and Fonseca 2017).

Given the broad empirical support for a significant and positive MPCR effect, our first hypothesis is that an artefactual field experiment will validate the core findings of previous ML-PGG lab experiments. Comparing stage 1 contributions of subjects that face a lower MPCR for the regional PG (0.25) than for the local PG (0.5) with stage 1 contributions of subjects that face equal MPCRs in both PGs, we predict a higher average share of endowments going to the regional PG when MPCRs are the same (and TB are higher). This would be in line with the results by Blackwell and McKee (2003) in a design with "minimal groups" and by Fellner and Lünser (2014) in a design without group identity and would reaffirm the dominance of the MPCR effect: The productivity of a contribution to the regional public good is higher for the higher MPCR while the price of a contribution is lower. Both mechanisms render contributing to the regional PG more attractive for subjects with social preferences, whether they are aware or unaware of a shared common identity. Applied to the design of the present experiment, this validation test leads to the following formulation.

> **Hypothesis 1 ("leveling up")**: *Average contributions to the regional public good will be higher in the HIGH MPCR treatment compared to the LOW MPCR treatment.*

In other words, contributions are predicted to respond positively to increases in the MPCR for a PG benefiting the larger group, and the positive MPCR effect is expected to be present both

in settings in which subjects are aware of a shared neighborhood affiliation and in which they are not. The comparison of contributions that form the core test of hypothesis 1, therefore, delivers a validation check on previous findings in the ML-PGG paradigm that have varied the MPCR of the regional PG both under anonymity and using minimal groups.

Following the validation exercise implicit in testing hypothesis 1, hypothesis 2 homes in on the core issue of this paper: Does a shared social identity in a subgroup of subjects engaged in a ML-PG provision problem lead to changes in contribution behavior that can unambiguously be judged to interfere with efficiency? In other words, is there a parochial bias that leads to efficiency losses in the level problem and if so, how big are these losses? Our strategy for establishing the presence and size of a parochial bias in the present ML-PGG is to examine the interaction effect between the shift in the MPCR in the regional good and the disclosure of a shared social identity in the local group. This strategy presents a clean test for the question of how ML-PG provision is affected by a potential parochial bias on account of activated social identity and is a key step toward answering the question of efficiency.[12] The presence of routine parochialism predicts that, relative to subjects in an anonymous setting, subjects aware of a shared local neighborhood affiliation attach greater weight to local outcomes (Bernhard et al. 2006). In a ML-PG provision problem, parochial subjects who are in favor of local outcomes compared to regional outcomes will, therefore, have less of an inclination to level up in response to a higher MPCR for the regional PG (Shayo 2009). In other words, awareness of a shared social identity in the local group prevents subjects from realizing the efficiency gains of a higher MPCR for the regional group to the same extent as subjects that are unaware of the shared identity. Applied to the present experimental design, these considerations are phrased as

> **Hypothesis 2 ("leveling up" with social identity):** *The interaction effect between the HIGH MPCR treatment and the LABEL treatment is predicted to be negative: Relative to subjects without knowledge of their group composition, subjects aware that the local public good benefits exclusively their neighbors increase the contributions to the higher level by less when the MPCR of the regional public good increases.*

[12] An alternative approach could be based on a simple comparison of contribution levels to the local and regional PG across social identity treatments at constant MPCR for the regional PG. A strategy based on comparing levels across the LABEL/NOLABEL treatment is not sufficient, however. The LOW MPCR treatment is a poor setting for a comparison because the TBs of the local and the regional account are identical such that any combination of contributions to the local and regional PG that leaves their sum broadly unchanged has the same impact on total provision. Comparing levels in the HIGH MPCR treatment, on the other hand, is complicated by evidence from previous experiments that even in anonymous group settings, the local PG attracts significant contributions despite its lower TBs. This sets a high baseline for an additional parochial bias to assert itself. Comparing total benefits across MPCRs is also problematic since productivity is exogenously higher in the HIGH MPCR condition.

The test of hypothesis 2 establishes the core result of our experiment. The remaining two hypotheses relate to two of our main robustness checks. Hypotheses 3 and 4 reinvestigate the presence of routine parochialism and a possible parochial bias when we focus on subgroups in which these phenomena are most likely to occur. To form these subgroups we exploit existing and induced heterogeneities among subjects in how they are expected to respond to the disclosure of a shared local affiliation in two ways. The first exploits a home-grown predisposition: We predict that subjects who articulate a strong attachment to their own neighborhood in the post-questionnaire (henceforth "local patriots") will display stronger forms of routine parochialism. This should increase the likelihood of displaying a parochial bias. The reasoning is the same as that underlying hypothesis 2 but now applied to a subsample of subjects particularly predisposed to exhibit parochialism and therefore parochial bias. This conjecture is captured in the following hypothesis.

Hypothesis 3 ("local patriots"): *Among a subsample of individuals that articulate strong neighborhood attachment, the interaction effect between the HIGH MPCR treatment and the LABEL treatment is predicted to be negative. "Local patriots" that are aware that their contributions to the local group benefit their "neighbors" are significantly less inclined to "level up" when the MPCR of the regional public good increases than those that are unaware.*

The second source of predisposition toward parochial choices, namely through priming, informs our fourth hypothesis. The priming procedure that subjects take prior to their stage 2 decision follows Chen et al. (2014) and Li et al. (2017) and is designed to activate an existing place attachment in the subject's mind. Subjects that have undergone the *local prime* version of the procedure and are then assigned to the LABEL condition in the social identity treatment are therefore expected to exhibit a stronger concern for how their allocation decisions in stage 2 impact on members of the small group, i.e. an increased level of parochialism. The predictions for locally primed subjects are then essentially the same as for a home-grown predisposition to parochialism: On average, subjects in the LABEL condition will increase their contributions towards the regional PG less as its MPCR doubles than subjects in the NOLABEL condition, who are unaware that the small group contains their "neighbors."

Hypothesis 4 (priming effect): *Among individuals that have undergone a priming procedure targeting place attachment, the interaction effect between the HIGH MPCR treatment and the LABEL treatment is predicted to be negative. After local priming, subjects that are aware that their contributions to the local group benefit their "neighbors" are*

significantly less inclined to "level up" when the MPCR of the regional public good increases than those who are unaware.

2.3 Procedure

Our inter-neighborhood intra-region experiment recruited participants from a total of four municipal districts in two German cities: namely, two from Heidelberg and two from Mannheim, cities that are located within 25 km of each other in the Rhine-Neckar metropolitan region. Heidelberg, with a population 150,000, consists of 15 municipal districts; Mannheim, with a population of 330,000, has 17 districts.

The recruitment procedure involved the distribution of around 11,000 invitation letters via mail to up to 3,000 randomly selected households in each of the four districts.[13] Assuming that a necessary prerequisite to forming a common local identity is to share a common local affiliation, we selected the neighborhoods based on their population turnover rates, socio-demographic characteristics, and location within the city. In Mannheim, we selected the inner-city district "Schwetzingerstadt/Oststadt," which has a higher turnover rate but an otherwise almost equal socio-economic structure compared to the suburban district of "Feudenheim." In Heidelberg, we selected the newly established district "Bahnstadt" as a strong contrast to the well-established and long-standing inner-district "Neuenheim." Table A.1 in the appendix reports the city characteristics for Heidelberg and Mannheim as well as the four respective districts for the year 2015.[14] The letter invited the receiving household to have one member of voting age take part in a scientific study on decision making that was being conducted by the University of Heidelberg and the Centre for European Economic Research (ZEW) in Mannheim. The letter offered €5 as reward for participating. Subjects were informed that they could earn additional individual payments in the course of a 15-minute study. No other information on the context of the study was given in this initial invitation letter.

A total of 616 individuals from Heidelberg (323) and Mannheim (293) took part in the main treatments of the online experiment.[15] They did so by following a link in the invitation letter with their internet-capable device.[16] To log in and start the experiment, participants entered an

[13] Since one district (Bahnstadt) is considerably smaller than the other three districts, we distributed invitation letters to all 2,000 households living in this district. We provide a translated version of the invitation letter in the supplementary material.

[14] Table A.2 in the appendix reports sample characterstics broken down by municipal district.

[15] A total of 232 additional subjects, 104 from Heidelberg and 128 from Mannheim, participated in our complementary MIX treatment that was run at the same time as our main treatments. The response rate to our recruitment efforts was thus 7.7 percent which compares favorably to typical response rates in cold mailing campaigns in direct mail marketing of field experiments (e.g. Karlan and List 2007).

[16] The programming was completed in LimeSurvey, a free open source software tool. The design was optimized for either the use of a desktop computer, laptop, tablet, or smartphone. In addition to the conventional link, the invitation letter contained a QR code to facilitate access to the online experiment.

individual access code provided in the invitation letter. The access code prevented participants from taking part in the study more than once. Upon logging into the experimental software, subjects were randomized to the different treatment conditions. Our randomization procedures were successful, as shown in Table A.3 of the appendix, which compares core demographics elicited in the questionnaire across treatment conditions and finds no significant differences. After going through a series of detailed instructions on the procedures, the decision task, and a set of numerical examples, participants made their decisions.[17] The average participant completed the experiment in approximately 15 minutes. We used an ex-post matching protocol to calculate final payoffs.

In terms of statistical inference, we based our sampling frame on previous estimates of the MPCR effect (Blackwell and McKee 2003, Fellner and Lünser 2014, Chakravarty and Fonseca 2017). We decided to oversample observations to all our main treatment cells, allowing us to detect a similarly sized MPCR effect at a conventional level of statistical significance (5%) at a level of statistical power of more than 95%.[18]

The initial endowment for the ML-PG was set at €8. Participants earned an average of €18.38 (including the €5 participation reward), which at 15 minutes average completion time compares favorably with typical hourly wages. Individual payments were implemented by sending households a payment card which could be used for purchases at many large retail chains, gas stations, and online shops.[19] The payment cards were credited with the individualized payments and sent out by mail four weeks after the conclusion of the experiment. All specifics regarding the payment procedure were disclosed to subjects prior to their first decision.

As part of the experimental procedure, subjects completed a post-questionnaire after the first decision task. The questionnaire collected information on individual characteristics of place attachment. We combined five measures commonly used in the place attachment literature in order to score participants' local identity (*local identity index*). These metrics are (1) whether participants deliberately decided to live in their neighborhood; whether they feel (2) happy, (3) proud, and (4) comfortable to be living in their neighborhood; and (5) how well they feel they identify with their neighborhood. Responses to each item were made on a five-point Likert scale from 1 (*not at all*) to 5 (*extremely*). The local identification score was calculated by standardizing responses to all five items and summing. At the end of the experiment, subjects

[17] We provide a diagram of the experimental procedures, the invitation letter and a translated version of the instructions in the supplementary material.

[18] The details of our power calculation are provided in the supplementary material. The results of our power calculations for the MPCR effect are shown in Figure S.2.

[19] This procedure allowed us to pay subjects in an incentive compatible way without having to personally interact with them which would be problematic both for reasons of anonymity and logistics.

completed another questionnaire collecting information on core demographics (age, gender, income, education, religiosity), duration of residence in the region (*years region*) and the municipal district (*years neighborhood*).[20] Drawing on municipal statistics from 2015, we compared our sample characteristics with those of the population living in the respective neighborhoods with respect to age, females in %, and religion in %. For household income and highest educational attainment, such comparisons are only possible at the city level (see Table A.1 in the appendix). With the exception of one neighborhood (Schwetzingerstadt/Oststadt), the age of our sample closely matches that of the respective neighborhoods. There are slightly fewer females in our sample than in the population. Moreover, in the two Mannheim neighborhoods we oversample individuals with above average income and in all neighborhoods our participants have higher education levels than the population living in the respective cities. In this sense, our experimental population, as in any experiment that relies on voluntary participation, is only partly representative of the population in the respective neighborhoods. It is not clear how this overrepresentation in respect to education or higher income may impact the interpretation of our findings. It is, for instance, well understood that this demographic group is also overrepresented in the political and economic processes that are at the core of the multilevel provision problem we investigate in this paper (Lijphart 1997, Milligan et al. 2014, Brade and Piopiunuk 2016). In this sense, our sample could potentially be more suitable than a more representative sample would be. It is, however, not well understood how these attributes link to parochialism.

3. Experimental Results

3.1. Full sample

We begin our analysis by describing the pooled data from stage 1 decisions across all treatments and participants. There, 32.8% of the sample contribute their full endowment either to the local (LPG) or the regional public good (RPG) and leave nothing in their private account. 6.1% of participants allocate their entire endowment to their private account. In line with the overwhelming evidence in PGG experiments, it is modal behavior to contribute some, but not all, of the endowment to PGs. This can also be seen in Figure 2, which plots participants' average contribution decisions to their private account and the LPG and RPG across all four treatment conditions.

[20] Table A.2 in the appendix reports the descriptive statistics of the post-questionnaire broken down by municipal district.

Before reporting on the first hypothesis test, we provide a first comparison between the behavior observed in our artefactual field experiment and that in previous laboratory studies. This comparison is based on the NOLABEL conditions, which provide the closest parallel. The choice of parameters in the LOW MPCR treatment mirrors the baseline conditions in Blackwell and McKee (2003) and Fellner and Lünser (2014) in that contributions to the LPG and the RPG produce the same TB, even if we use different absolute MPCRs. Both lab studies find significantly higher contributions to the LPG than to the RPG. By contrast, we observe nearly equal average contributions to the LPG and the RPG (2.78 vs. 2.88, $p = 0.266$, MW-U test). This could be due to differences between field and laboratory as well as other design differences such as group size (Blackwell and McKee 2003), and the absolute level at which the MPCR is set (Blackwell and McKee 2003, Fellner and Lünser 2014).

Hypothesis 1 conjectures that the artefactual field experiment will replicate a core finding of previous laboratory experiments – namely, that a higher MPCR for the regional good causes significantly higher contributions to this good. We test hypothesis 1 by comparing contributions to the RPG at different MPCRs in both the NOLABEL and the LABEL conditions.[21] In the NOLABEL treatment, contributions to the RPG are significantly higher when the MPCR is set at 0.5 compared to an MPCR of 0.25 (2.88 vs. 4.64, $p < 0.001$, MW-U test). The same is true in the LABEL treatment (2.82 vs. 4.42, $p < 0.001$, MW-U test).[22] These tests are summarized in

Result 1 ("leveling up"): *There is a positive MPCR effect: Average contributions to the regional public good are significantly higher in the HIGH MPCR treatment compared to the LOW MPCR treatment.*

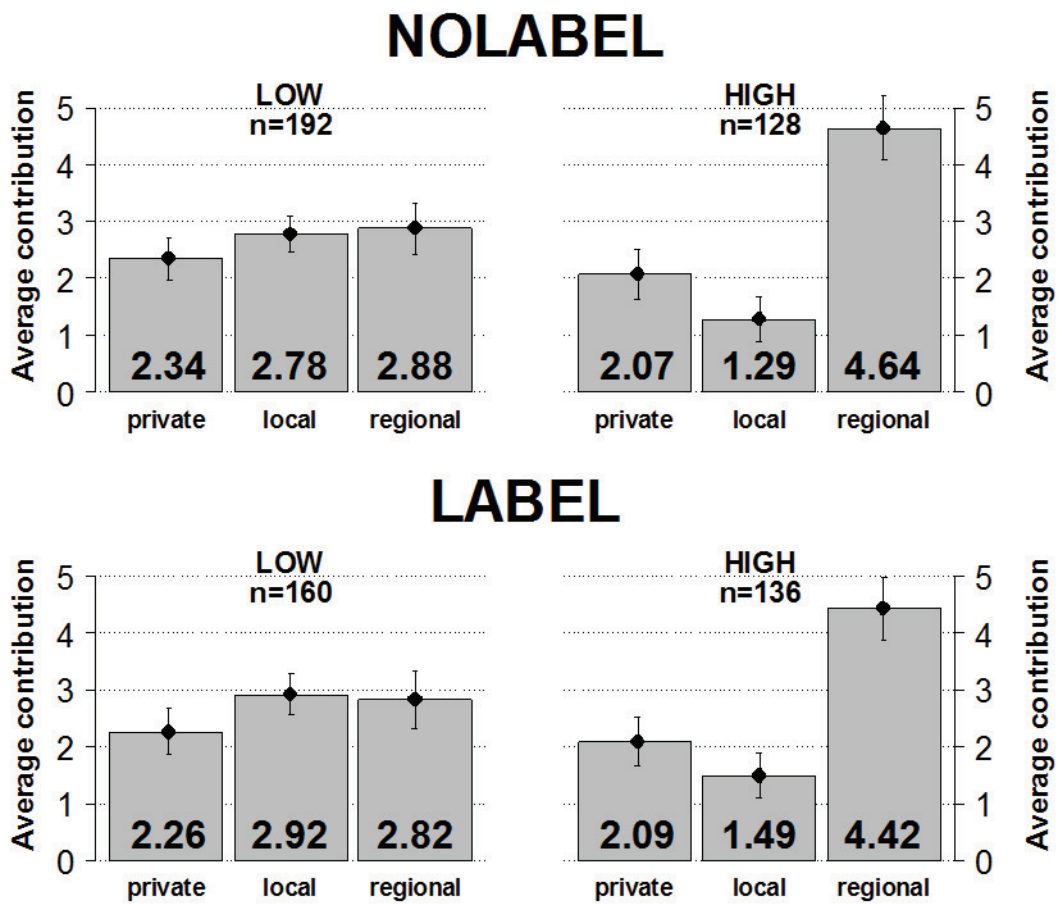
We note in passing that the positive MPCR effect observed in this experiment is a substitution effect between the two PGs. The average share of endowment allocated to the private account does not change significantly across the MPCR conditions (NOLABEL: 2.34 vs. 2.07, $p = 0.309$; LABEL: 2.26 vs. 2.09, $p = 0.343$, MW-U test). Average contributions to the LPG are significantly lower, however (NOLABEL: 2.78 vs. 1.29, $p < 0.001$; LABEL: 2.92 vs. 1.49, $p < 0.001$, MW-U test). This observed substitution from the LPG to the RPG is well in line with the findings of Fellner and Lünser (2014) but contrasts with that of Blackwell and McKee

[21] Although all of our hypotheses are directional (see Section 2.2), we follow the convention to base all reported results on more conservative two-sided test statistics. Also, note that none of our main conclusions would change if we relied on one-sided tests instead.

[22] All statistically significant results reported are robust to corrections for multiple hypothesis testing proposed by List et al. (2016).

(2003), who find that contributions are substituted from the private account toward the non-excludable public good.[23]

Figure 2: Average contributions in the four treatment conditions, full sample



Note: Average contributions to private, local, and regional accounts in the NOLABEL (upper half) and LABEL (lower half) of LOW (left) and HIGH (right) for the whole sample. Confidence intervals at the 95% level.

Having validated one of the key findings from lab-based ML-PGG experiments in an artefactual field setting in result 1, we now turn to a formal test of hypothesis 2, which forms the core of the paper. Following hypothesis 2, we expect that the strength of the MPCR effect will be smaller in the LABEL condition, which invokes naturally occurring social identity, compared to the NOLABEL condition, which does not even invoke minimal group identity. First note that, for the average subject, the effect of invoked social identity on contributions to the LPG is positive, but small and fails to reach statistical significance (LOW: 2.78 vs. 2.92, $p = 0.266$; HIGH: 1.29 vs. 1.49, $p = 0.363$, MW-U test). This finding might be driven by individual differences in place attachment. In this section, we focus on the average subject before

[23] As already noted by Fellner and Lünser (2014), the results of Blackwell and McKee (2003) have to be interpreted with some caution as they are derived from only one independent observation per treatment.

investigating potential differences in subjects' place attachment and their impact on the MPCR effect in more detail in section 3.2 and 3.3. The test of hypothesis 2 is essentially a difference-in-difference test in which we compare whether the MPCR effect (the difference between LOW and HIGH MPCR contributions) differs between the NOLABEL and LABEL condition. In the NOLABEL condition, the MPCR effect gives rise to an increase of €1.76 in contributions to the RPG. By comparison, the MPCR effect in the LABEL condition has 90 percent of the baseline strength (€1.60), or, conversely, the average strength of the parochial bias found in our experiment is 10 percent. Invoking social identity had, therefore, no significant effect on the average subject's responsiveness to an increase in the MPCR of the RPG.[24] This is summarized in

Result 2 ("leveling up" with social identity): *At 10 percent, the parochial bias found in the experiment is below the detection threshold: For the average subject there is no statistical difference in the strength of the MPCR effect. This indicates that a shared social identity does not significantly change the increase in contributions to the regional public good when its MPCR increases.*

The non-parametric test of hypothesis 2 is supported by regression analysis. Table 2 reports the results of a simple OLS model of participants' contributions to either the private, local, or regional account. The baseline is the contributions of subjects assigned to a treatment without social identity invoked (NOLABEL) and at an MPCR of 0.25 for the RPG (LOW). The dummy variable (*LABEL*) indicates assignment to treatment condition LABEL and the dummy variable (*HIGH*) assignment to a treatment with an MPCR of 0.5 for the RPG. The variable of interest is the interaction term of the two dummies (*HIGH x LABEL*), which captures whether contributions respond differently to a change in the MPCR when participants share a common local affiliation. We estimate both a simple model (first three columns of coefficients) as well as a richer model with further controls (second three columns). The controls comprise individual characteristics collected in the post-questionnaire: *age*, gender (*female*), *income*, years of *education*, the degree of *religious* affiliation (based on a five-point Likert scale from 1 "not at all" to 5 "extremely"), the time living in the respective neighborhood (*neighborhood*), and the time in the metropolitan region (*region*).

[24] Beekman et al. (2017) induce conflicts to create out-group hostility and deepen in-group favoritism in a ML-PGG. They hypothesize that the effect of an increase in the MPCR might be smaller in cases where groups have previously competed against one another than in cases where groups share no previous interaction. However, they do not report statistical tests on size differences in treatment effects. Potential differences to our results would not be surprising, since we abstain from inducing conflicts and instead concentrate on a setting where preexisting identities might play a role.

Table 2: Individual contributions, full sample

	(1)	(2)	(3)	(4)	(5)	(6)
	q^p	q^l	q^r	q^p	q^l	q^r
	Private	Local	Regional	Private	Local	Regional
HIGH	-0.27	-1.49***	1.76***	-0.26	-1.61***	1.87***
	(0.260)	(0.212)	(0.309)	(0.263)	(0.215)	(0.311)
LABEL	-0.08	0.14	-0.07	-0.04	0.07	-0.03
	(0.241)	(0.244)	(0.282)	(0.249)	(0.252)	(0.296)
HIGH x LABEL	0.09	0.06	-0.16	0.08	0.22	-0.23
	(0.367)	(0.309)	(0.444)	(0.377)	(0.317)	(0.456)
Constant	2.33***	2.78***	2.88***	3.09***	2.59***	2.33***
	(0.169)	(0.169)	(0.188)	(0.606)	(0.547)	(0.736)
Controls	No	no	no	yes	yes	yes
Neighborhood FE	No	no	no	yes	yes	yes
# of observations	616	616	616	602	602	602

Notes: OLS regressions, $q^p, q^l, q^r \epsilon [0,8]$, with robust standard errors in parentheses; $*p < 0.1$, $**p < 0.05$ and $***p < 0.01$. The first three columns report the results of the basic models that only include the main treatment variables (HIGH and LABEL) as well as their interaction (HIGH x LABEL) as regressors. Columns (4) – (6) report results from regressions that contain additional control variables (age, gender, income, education, religiosity, years of residence in the neighborhood, years of residence in the metropolitan region) as well as neighborhood fixed effects. Statistically significant results reported above are robust to jointly estimating regressions (2), (3) and respectively (5), (6) as seemingly unrelated regression equations.

The regression results reaffirm results 1 and 2: The coefficients associated with the dummy variable HIGH show that at a higher MPCR, average contributions to the RPG are higher and contributions to the LPG lower, thus supporting result 1. Also note that the coefficients estimated for LABEL have the predicted sign (positive for the LPG, negative for the RPG), but are small and statistically insignificant for all three accounts. This does not necessarily imply that no parochial bias exists in our setting, but rather that the bias is too small to be detectable at conventional levels of statistical significance and power. Given a total sample size of more than 600 participants, a parochial bias of 30% (i.e. a bias that would reduce the baseline MPCR effect by 30%) or more would be detectable at the standard level of statistical significance (5%) and power (80%), based on power calculations.[25] Put differently, to detect a reduction of the MPCR effect of 10% or less (which is quantitatively close to the reduction we see in our data) at the same level of statistical significance and power would require a sample size of at least 4,000 participants per cell.

3.2. Robustness Check I: Pre-existing heterogeneity in place attachment

A possible concern about result 2 could be that it is derived in a setting in which the average level of parochialism among subjects is perhaps less than the researcher expected. We thus

[25] The details of our power calculation are provided in the supplementary material. The results of our power calculations for the parochial bias are shown in Figure S.3.

subject our findings to a series of robustness checks, starting with robustness to pre-existing heterogeneity in place attachment before exploiting the priming task that was part of the design.

Subject bring pre-existing differences in place attachment to the experiment: Some citizens identify much more with their own neighborhood than others. The strength of social identity can therefore be an important factor in the success of identity activation (Candelo et al. 2017): When place attachment is relatively unimportant to a subject's social identity, revealing a shared local affiliation may not be sufficient to induce a change in contribution behavior. Subjects with strong place attachment, on the other hand, may respond more strongly than the average person to such information. This observation is important for two reasons: One is that there are spatial contexts in which neighborhood attachment is very prominent (such as sectarian cities with minimal intra-neighborhood mobility; see e.g. Meier et al. 2016). It is, therefore, useful to understand whether subjects with pronounced place attachment also differ from the rest of the population in their propensity to level up. The other is that in real-world settings in which contribution decisions to PG often have a sequential dimension, heterogeneity in the interaction effect could incite subjects with strong neighborhood attachment to be the first to contribute to the local PG, thus conceivably setting in motion a path towards parochialism that other participants subsequently follow (Vesterlund 2003, Andreoni and Petrie 2004).

To test for the possibility of a heterogeneous interaction effect, we first identify the subsample of subjects for whom place attachment is likely to matter most. This identification relies on a composite index that measures the degree of group identity based on five questions concerning participants' affiliation with the neighborhood. Those above the median index value exhibit above-median place attachment.[26] In shorthand, we refer to this group as *local patriots*.

As a first construct validity test, we find that local patriots, i.e. those that express above-median place attachment, exhibit a distinct contribution behavior compared to those that express below-median place attachment. For example, local patriots contribute significantly more to the LPG than subjects with a below median place attachment, but only when a shared neighborhood affiliation in the small group is revealed (LABEL), irrespective of the MPCR condition (LOW: 3.30 vs. 2.52, $p = 0.013$; HIGH: 1.86 vs. 1.16, $p = 0.006$, MW-U test). Unaware of the shared

[26] Place attachment is measured as the degree to which individuals agreed on a five-point Likert scale from 1 "not at all" to 5 "extremely" to the following five items: "deliberately decided to live in their neighborhood," "happy to live in their neighborhood," "proud to live in their neighborhood," "feel comfortable to live in their neighborhood," and "perceive identification" with their neighborhood each measured on a five-point Likert scale from 1 "not at all" to 5 "extremely." The standardized index ranges between -2.561 and 1.530 with a mean and median of -0.028 and -0.019, respectively. The higher the identity index, the stronger is the subjects' local place attachment. Absolute levels of the index across neighborhoods are provided in Table A.1 in the appendix.

neighborhood in the small group (NOLABEL), their contribution behavior is indistinguishable from the rest of the sample (LOW: 2.99 vs. 2.55, p = 0.176; HIGH: 1.27 vs. 1.30, p = 0.933; MW-U test).[27] Local patriots therefore not only express above-median place attachment, they also contribute significantly more to the LPG than other subjects if and only if they know that the local group consists of neighbors. In short, local patriots' contribution behavior differs from that of other subjects and suggests the presence of a routine parochialism that could interfere with efficiency.

Table 3: Individual contributions, local patriots

	(1) q^p Private	(2) q^l Local	(3) q^r Regional	(4) q^p Private	(5) q^l Local	(6) q^r Regional
HIGH	-0.49	-1.25***	1.74***	-0.43	-1.33***	1.76***
	(0.398)	(0.307)	(0.472)	(0. 399)	(0. 318)	(0.482)
LABEL	-0.42	0.75**	-0.32	-0.45	0.77**	-0.32
	(0.341)	(0.355)	(0.416)	(0.350)	(0.377)	(0.450)
HIGH x LABEL	0.59	-0.19	-0.40	0.51	-0.14	-0.37
	(0.530)	(0.448)	(0.646)	(0.532)	(0.474)	(0.671)
Constant	2.47***	2.55***	2.99***	4.17***	1.93***	1.90***
	(0.261)	(0.248)	(0.299)	(0.889)	(0.779)	(1.11)
Controls	No	no	no	yes	yes	yes
Neighborhood FE	No	no	no	yes	yes	yes
# of observations	302	302	302	294	294	294

Notes: OLS regressions, $q^p, q^l, q^r \epsilon [0,8]$, with robust standard errors in parentheses; $*p < 0.1$, $**p < 0.05$ and $***p < 0.01$. The first three columns report the results of the basic models that only include the main treatment variables (HIGH and LABEL) as well as their interaction (HIGH x LABEL) as regressors. Columns (4) – (6) report results from regressions that contain additional control variables (age, gender, income, education, religiosity, years of residence in the neighborhood, years of residence in the metropolitan region) as well as neighborhood fixed effects. Statistically significant results reported above are robust to jointly estimating regressions (2), (3) and respectively (5), (6) as seemingly unrelated regression equations.

The presence and nature of the MPCR effect and the presence of an interaction effect between MPCR and a LABEL effect are thus obvious areas in which additional clarification is needed. Hypothesis 3 predicts that this interaction effect will be present and, in light of result 2, significantly negative. To explore this issue, we first test for the MPCR effect by comparing in both social identity conditions the change in contributions to the RPG as the MPCR of the RPG doubles. Doubling the MPCR raises contributions to the RPG among local patriots by €1.74 (p < 0.001, MW-U test) without knowledge of shared neighborhood (NOLABEL) and by €1.33 (p < 0.001, MW-U test) with knowledge of shared neighborhood (LABEL). This finding reaffirms result 1: Local patriots also exhibit a positive MPCR effect. Testing hypothesis 3

[27] This is consistent with the observation that local patriots also respond more strongly and statistically significantly to the social identity treatment than others. Knowledge about a shared neighborhood in the small group makes local patriots increase their contributions to the LPG by 1.2 (LOW MPCR, p < 0.05) and by 0.6 (HIGH MPCR, p < 0.10) relative to those without strong neighborhood attachment.

requires a comparison of the MPCR effects across the social identity treatment. Table 3 reports the coefficients of the regression analysis conducted for the reduced sample of local patriots. The results reaffirm the MPCR effect (dummy *HIGH*) as well as the positive impact of revealed shared neighborhood on contributions to the LPG. The interaction effect, however, does not deliver statistically significant results.[28]

Result 3 ("leveling up" by local patriots): *For subjects with above-median place attachment, revealing neighborhood ties does not result in less leveling up: Despite the fact that we find a positive label effect for the local patriots (i.e. higher average contributions to the local account among subjects in the LABEL treatment), there is no statistical difference in the strength of the MPCR effect.*

Taken together, these findings have a number of implications. One is that the MPCR effect and parochialism impact contributions independently. "Local patriots" behave more cooperatively towards others when they are aware that others are also locals and they respond to changes in the MPCR of a PG in the predicted way. However, their response to a change in the MPCR is not modulated by parochialism. Put differently, the parochialism observed in "local patriots," as evidenced in higher contributions to the LPG, is independent of how productive it is to provide the PG at a higher level in the parameters of our experiment. This independence, in turn, adds robustness to the sample average that is reported in result 2: Since the parochial bias of "local patriots" does not interact with the MPCR effect, it is clear that result 2, the zero effect on average, is not the outcome of countervailing effects among those with strong and those with weak place attachment.[29]

3.3. Robustness Check II: Priming for place attachment

Despite relying on naturally occurring forms of social identity that are expected to affect behavior more substantially than minimal group identity, a conceivable objection to our experimental design could be a concern that it insufficiently stimulates an existing predisposition towards behaving parochially. If true, the results based on observed behavior in the social identity treatments LABEL/NOLABEL would underestimate the true effect of social identity. A robustness check based on pre-existing heterogeneity in place attachment, like the

[28] This null result is not driven by our categorization of "local patriots" based on the above median identification. Applying stricter definitions of local patriots (such as the upper quartile of all participants) does not alter our results and does not provide statistical evidence for a significant interaction effect.

[29] Not only is the interaction term not significantly different from zero, but it also does not differ significantly between local patriots and the remaining subjects. However, it is still the case that local patriots show more parochialism than the remaining subjects as they contribute more to the local account when they are in the label condition. Both results come from a regression including a dummy for local patriots as well as a three-way interaction term. This regression is available upon request from the authors.

one conducted in subsection 3.2, would not provide a remedy if making group affiliation observable was indeed insufficient, because the subsample of local patriots is defined relative to the sample median rather than to an absolute benchmark.

To examine whether result 2 is robust against the possibility of an insufficient experimental stimulus, we use observations from stage 2 of the experiment, i.e. after the priming task. A total of 454 subjects underwent the local priming version that is of interest here. As a first test, we compare the behavior between the LABEL and the NOLABEL treatment in stage 2 across the MPCR conditions. As in the previous tests, there is a strong MPCR effect on contributions to the RPG in the control group under the NOLABEL condition. Both the size and significance of the effects are comparable to the previous results and give rise to an increase of €1.77, reaffirming result 1.[30] In the LABEL condition, doubling the MPCR raises contributions to the RPG by €1.82 (2.46 vs. 4.28, $p < 0.001$, MW-U test). Also, priming has the expected effect on contribution behavior, providing a manipulation check on the priming procedure: Locally primed subjects in the LABEL treatment have significantly higher average contributions to the LPG than the control group both at a LOW MPCR (3.07 vs. 2.5, $p = 0.054$, MW-U test) and a HIGH MPCR (1.65 vs. 0.94, $p = 0.001$, MW-U test).[31] In short, the priming procedure induces more parochialism, which could affect the presence of the parochial bias.

Table 4: Individual contributions, full sample, after local prime

	(1)	(2)	(3)	(4)	(5)	(6)
	q^p	q^l	q^r	q^p	q^l	q^r
	Private	Local	Regional	Private	Local	Regional
HIGH	-0.21	-1.56***	1.77***	-0.28	-1.50***	1.78***
	(0.383)	(0.287)	(0.416)	(0.402)	(0.303)	(0.435)
LABEL	-0.31	0.57*	-0.26	-0.34	0.59*	-0.26
	(0.328)	(0.323)	(0.343)	(0.345)	(0.342)	(0.368)
HIGH x LABEL	-0.18	0.14	0.05	-0.08	-0.07	0.15
	(0.472)	(0.378)	(0.528)	(0.495)	(0.396)	(0.554)
Constant	2.78***	2.50***	2.72***	3.15***	1.93***	2.92***
	(0.261)	(0.255)	(0.277)	(0.756)	(0.646)	(0.911)
Controls	No	no	no	yes	yes	Yes
Neighborhood FE	No	no	no	yes	yes	Yes
# of observations	454	454	454	443	443	443

Notes: OLS regressions, $q^p, q^l, q^r \epsilon [0,8]$, with robust standard errors in parentheses; $*p < 0.1$, $**p < 0.05$ and $***p < 0.01$. The first three columns report the results of the basic models that only include the main treatment variables (HIGH and LABEL) as well as their interaction (HIGH x LABEL) as regressors. Columns (4) – (6) report results from regressions that contain additional control variables (age, gender, income, education, religiosity, years of residence in the neighborhood, years of residence in the metropolitan region) as well as neighborhood fixed effects. Statistically significant results reported above are robust to jointly estimating regressions (2), (3) and respectively (5), (6) as seemingly unrelated regression equations.

[30] Contributions to the RPG increase significantly (2.72 vs. 4.49, $p < 0.001$) for a doubling of the MPCR while contributions to the LPG decrease significantly (2.50 vs. 0.94, $p < 0.001$).

[31] While in LOW these additional contributions to the LPG accrue at the expense of lower contributions to both the private account (-0.3) and the RPG (-0.2), in HIGH we find additional contributions to the LPG primarily driven by lower contributions to the private account (-0.5) and a moderate decrease in RPG contributions (-0.2).

Despite this evidence of successfully induced parochialism, the interaction effect between an increase in the MPCR and invoking social identity is again insignificant and hence suggests the absence of a parochial bias. Table 4 reports the results of the regression analysis of the contributions decisions using the same estimation strategy as for tables 2 and 3. The results are similar to those for the restricted sample of stage 1 contributions by subjects with above-median place attachment presented in table 3. The coefficient estimates in table 4 reaffirm a positive MPCR effect (dummy *HIGH*) that leads to a substitution away from LPG to RPG. The results in table 4 also confirm the presence of a pro-local bias induced by the revelation of shared neighborhood affiliation (dummy *LABEL*): Contributions to the LPG are higher. At the same time, table 4 also reaffirms the lack of an interaction effect: The change in contributions caused by a doubling of the MPCR in the RPG is statistically indistinguishable between subjects primed for neighborhood attachment to whom a shared neighborhood affiliation in the local group is disclosed and primed subjects to whom it is not disclosed.

As a second test, we rerun the regression on a restricted sample of 229 subjects who were allocated to the same social identity condition in both stages. This eliminates a potential attenuation of the treatment effects in the NOLABEL treatment in stage 2 by subjects who were assigned to the LABEL treatment in stage 1 and were therefore aware of the composition of the small group. In line with the evidence from the full sample, without knowledge of shared neighborhood (NOLABEL), the MPCR effect gives rise to an increase of €2.00 ($p < 0.001$, MW-U test) in contributions to the RPG. With knowledge of a shared neighborhood attachment (LABEL), the increase is €2.13 ($p < 0.001$, MW-U test).[32]

Table 5 reports the results of our regression analyzes and shows that the interaction effect between an increase in the MPCR and invoking social identity is again not statistically significant. Jointly, these tests of the effect of the local priming procedure on contributions inform our final result.

Result 4 (no interaction effect through priming): *For subjects who have undergone local priming, revealing neighborhood ties does not result in less leveling up: Even though priming results in a positive label effect (i.e. higher average contributions to the local account among subjects in the LABEL treatment), there is still no statistical difference in the strength of the*

[32] In order to control for potential carry over effects between the first and the second stage that could interfere with the effect of the prime, we restrict our sample even further and rerun the regressions for those participants who have been assigned to NOLABEL (n = 238) or LABEL (n = 216) in stage one of the experiment separately. Also in these specifications there is no statistically significant difference in the strength of the MPCR effect for subjects primed for neighborhood attachment to whom a shared neighborhood affiliation in the local group is disclosed and primed subjects to whom it is not disclosed.

MPCR effect exhibited by subjects primed for place attachment across the social identity treatment conditions.

Table 5: Individual contributions, restricted sample, after local prime

	(1) q^p Private	(2) q^l Local	(3) q^r Regional	(4) q^p Private	(5) q^l Local	(6) q^r Regional
HIGH	-0.02	-1.99***	2.00***	-0.00	-2.06***	2.06***
	(0.524)	(0.441)	(0.558)	(0.565)	(0.485)	(0.589)
LABEL	-0.04	0.33	-0.28	0.04	0.27	-0.32
	(0.465)	(0.490)	(0.471)	(0.510)	(0.530)	(0.512)
HIGH x LABEL	-0.44	0.31	0.13	-0.52	0.30	0.23
	(0.663)	(0.561)	(0.724)	(0.727)	(0.617)	(0.790)
Constant	2.58***	2.98***	2.44***	3.51***	2.41***	2.08*
	(0.359)	(0.399)	(0.380)	(1.09)	(0.930)	(1.22)
Controls	No	no	no	yes	yes	Yes
Neighborhood FE	No	no	no	yes	yes	Yes
# of observations	229	229	229	225	225	225

Notes: OLS regressions, $q^p, q^l, q^r \epsilon [0,8]$, with robust standard errors in parentheses; $*p < 0.1$, $**p < 0.05$ and $***p < 0.01$. The first three columns report the results of the basic models that only include the main treatment variables (HIGH and LABEL) as well as their interaction (HIGH x LABEL) as regressors. Columns (4) – (6) report results from regressions that contain additional control variables (age, gender, income, education, religiosity, years of residence in the neighborhood, years of residence in the metropolitan region) as well as neighborhood fixed effects. Statistically significant results reported above are robust to jointly estimating regressions (2), (3) and respectively (5), (6) as seemingly unrelated regression equations.

This result also supports the previous finding that the MPCR and the social identity effects are unrelated, even when the propensity for place attachment is procedurally activated through a priming task.

3.4. Robustness Check III: Differentiated productivity of the regional public good

One might worry that the absence of an interaction effect between LABEL and HIGH among our average subjects as well as local patriots is driven by the specific parametrization of our ML-PGG. In HIGH, the MPCRs ($\alpha^l = \alpha^r = 0.5$) are equal for both the LPG and the RPG. Thus, subjects can benefit their close neighbors equally by either contributing to the LPG or the RPG. As a consequence, contributing to the RPG generates additional benefits to non-neighbors at no cost to neighbors. This need not but might affect the intensity of a potential parochial bias depending on the importance of parochial motives. To further examine the robustness of our results with regards to this concern, we conducted a complementary treatment (MIX) with n = 232 additional subjects simultaneously to our main treatments. In the MIX treatment, the productivity of contributions to the RPG differs between members of the local group

(neighbors) and members of the regional group from a different neighborhood (non-neighbors). To generate a trade-off between total benefits and benefiting the more local group, the LPG has an MPCR of 0.5 while the MPCR in the RPG differs for neighbors (0.25) and non-neighbors (0.75). This implies that the average MPCR is 0.5 and the TB of the RPG are higher in MIX (4) than in LOW (2). The MIX treatments are again run in the LABEL and NOLABREL conditions to test for the presence of a parochial bias under this different set of parameters.

With respect to contribution patterns, we test contributions to the RPG at the different MPCR conditions in both the NOLABEL and LABEL conditions. In the NOLABEL (LABEL) treatment, subjects in the MIX condition contribute an average of €3.44 (€2.71) to the RPG compared to €2.88 (€2.82) in the LOW MPCR condition. Contributions to the RPG are higher in MIX compared to LOW. However, neither in the NOLABEL (p = 0.235, MW-U test) nor in the LABEL (p = 0.540, MW-U test) condition does this increase reach statistical significance. Hence, in the MIX treatments we do not observe that subjects level up and contribute significantly more to the more efficient higher level public good. This failure to level up appears to be more pronounced in the LABEL condition and could indicate the presence of a parochial bias.

Table 6: Individual contributions, full sample in MIX

	(1)	(2)	(3)	(4)	(5)	(6)
	q^p	q^l	q^r	q^p	q^l	q^r
	Private	Local	Regional	Private	Local	Regional
MIX	0.18	-0.74**	0.55	0.22	-0.69**	0.47
	(0.390)	(0.288)	(0.444)	(0.397)	(0.287)	(0.456)
LABEL	-0.08	0.14	-0.07	-0.01	0.09	-0.08
	(0.241)	(0.244)	(0.283)	(0.251)	(0.255)	(0.296)
MIX x LABEL	0.22	0.45	-0.66	0.17	0.46	-0.63
	(0.530)	(0.436)	(0.597)	(0.534)	(0.443)	(0.607)
Constant	2.34***	2.78***	2.88***	2.58***	2.65***	2.77***
	(0.170)	(0.170)	(0.188)	(0.735)	(0.683)	(0.879)
Controls	no	no	no	yes	yes	Yes
Neighborhood FE	no	no	no	yes	yes	Yes
# of observations	468	468	468	454	454	454

Notes: OLS regressions, $q^p, q^l, q^r \epsilon [0,8]$, with robust standard errors in parentheses; $*p < 0.1$, $**p < 0.05$ and $***p < 0.01$. The first three columns report the results of the basic models that only include the main treatment variables (HIGH and LABEL) as well as their interaction (HIGH x LABEL) as regressors. Columns (4) – (6) report results from regressions that contain additional control variables (age, gender, income, education, religiosity, years of residence in the neighborhood, years of residence in the metropolitan region) as well as neighborhood fixed effects. Statistically significant results reported above are robust to jointly estimating regressions (2), (3) and respectively (5), (6) as seemingly unrelated regression equations.

A formal test for this proposition is reported in table 6 containing the corresponding regression analysis. The effect of increasing the total benefit from contributions to the RPG is 0.55 (-0.11) across NOLABEL and LABEL. The interaction effect has the hypothesized sign and is larger

in absolute terms than in the treatments with symmetric benefits, yet does still not reach statistical significance at conventional levels.

We also rerun the previous analysis in a restricted sample of local patriots and report results in Table A.4 of the appendix. We again find that local patriots are more inclined to contribute to the LPG and hence display clear signs of parochialism. As in the symmetric MPCR treatments, increasing the total benefits of the RPG in the MIX treatment leads to higher contributions, yet this effect is not as strong as in the symmetric case. The MIX treatments tentatively indicate the presence of a stronger parochial bias, especially when restricting attention to the subgroup of local patriots: the size of the MPCR effect is now much smaller in the LABEL treatments than in the NOLABEL treatments. Despite this quantitatively meaningful reduction, the difference in effect sizes is still statistically indistinguishable, as evidenced by the insignificant interaction term.

In sum, the MIX treatment demonstrates that in a nested structure, where local groups benefit less from public goods that are provided at the higher level than non-local groups, there might be both a lower tendency to level up (i.e. an overall smaller increase in contributions to the more efficient higher level public good) and a larger scope for a parochial bias to manifest (i.e. less leveling up if local affiliations are known and hence parochialism can affect contributions). Furthermore, in the MIX treatments, benefits from the public good are not distributed equally. Accordingly, additional behavioral motives such as inequity aversion could also prevent subjects from contributing to the higher level public good, even when local affiliations are not revealed.

4. Conclusion

The starting point of this paper was the question as to whether naturally grown social identity – a well-established source of biases in other-regarding behavior – also negatively affects the efficiency of multi-level public goods provision due to parochial concerns in a nested provision structure. Building on the experimental paradigm of the multi-level public goods game and the well-established concept of neighborhood attachment, the paper tests whether subjects who know that their contributions to the lower level public good specifically benefit their neighbors respond less to a higher MPCR in the higher level public good than subjects who are unaware of the shared neighborhood attachment.

Our evidence from an artefactual field experiment design brings three novel elements to bear on the question. One element is a field context that favors naturally grown social identity as a behavioral driver of routine parochialism. The second element is the particular neighborhood-

within-a-region setting that allows parochialism to naturally assert itself at the local level. The third is a two-by-two design that varies the public good's productivity across levels and the salience of social identity. This two-by-two design makes disentangling both dimensions in a formal test possible. Jointly, these elements confirm previous evidence that there is a positive MPCR effect in multi-level public goods, but also that level-wise allocations of public goods contributions do not efficiently respond to relative total productivities. Our results, including several robustness checks, show, however, that inefficiencies of level-wise allocations need not constitute a parochial bias that stems from the attachment to a local subgroup. Even though subjects with above-median neighborhood attachment and subjects who have been procedurally primed on their neighborhood attachment exhibit clear evidence of parochialism by behaving more cooperatively towards their own local group if and only if they know that the local group consists of neighbors, their response to a change in the MPCR is statistically indistinguishable from a situation in which local identity and routine parochialism cannot play any role by design. Most importantly, our results challenge the hypothesis that a shared social identity in the smaller group makes the average subject less responsive to higher efficiency of contributing to the larger group.

In our setting, parochialism – in a routine but politically relevant form of social identity induced by neighborhood attachment – does not interfere in a detectable way with the degree of efficiency in the provision of public goods that span across several neighborhoods. This is even true when we focus on a subgroup of individuals who state they identify strongly with their own local subgroup or who are conceptually primed to do so. This is a first step to better understanding the role of naturally grown social identities in a real-world multi-level public good setting. Future research is needed to extend this line of inquiry to other, potentially stronger sources of social identity such as those induced by ethnicity in a multiethnic society (Candelo et al. 2017, Schaub 2017), nationality within a supranational entity such as the EU, or civil conflict in a diverse society (Voors et al. 2012). Similarly, results from the MIX treatment tentatively suggest that higher level public goods that provide asymmetric benefits to different groups may suffer from less leveling up and a stronger parochial bias than their counterparts that offer symmetric benefits.

As in any experiment that has to rely on voluntary participation, our sample is not representative in all aspects of the general population, particularly in relation to income and educational attainment. While this may affect the amount of routine parochialism present in our sample, many political and social processes that influence the provision of public goods are likewise not fully representative. For example, electoral participation is characterized by an

overrepresentation of more educated and higher income individuals that resembles their overrepresentation in our sample. The composition of our sample, while not fully representative of the general population as a whole, may therefore make it better suited to exploring the policy question underlying our experiment.

In sum, we find that the naturally grown type of social identity we study here does not necessarily imply a parochialism penalty on efficiency in a situation in which public goods can be provided at more than one spatial level. Importantly, we are not claiming that the private provision of public goods will be efficient, which would run counter to an overwhelming body of theoretical, empirical, and experimental evidence. We are only claiming that social identity does not further increase the inefficiencies inherent in the social dilemma of nested ML-PG provision in the context of the routine parochialism studied here.

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Appendix

Table A.1: City and district characteristics

Attributes	**Heidelberg** (state of data 31.12.2015)[a]			**Mannheim** (state of data: 31.12.2015)[b]		
	Overall	Bahnstadt	Neuenheim	Overall	Feudenheim	Schwetzingerstadt/ Oststadt
Size (in km2)	108.8	1.1	5.7	144.96	6.07	4.41
Inhabitants (in #)	143,855	2,581	13,075	317,744	13,989	22,385
Female (in %)	52.1	46.8	53.7	49.5	52.9	50.6
Average age (in years)	39.9	28.9	39.3	42.7	46.9	42.2
Religion (in %)	55.6	44.1	56.2	51.6	61.2	51.0
Income (in €)[c]	2,063	-	-	1,603	-	-
Education (in years)[d]	12.23	-	-	11.19	-	-
Germans (in %)	81	77.8	81	74.8	91.4	77.6
Fluctuation (in #)						
moving in	30,338	859	3,342	37,000	1,041	3,722
moving out	29,116	575	3,407	30,632	1,022	3,489
Fluctuation (in %)						
moving in rate	21.1	33.3	25.6	11.6	7.4	16.6
moving out rate	20.1	22.3	26.1	9.6	7.3	15.6

Notes: Data for Heidelberg and Mannheim is based on principle residents in the year 2015. [a] Data from the Amt für Stadtentwicklung und Statistik, Heidelberg. Eigene Fortschreibung 2018,Office for Urban Development, http://ww2.heidelberg.de/datenatlas/2015/atlas.html, last access October 2018.
[b] Data from the Municipal Statistics Office Mannheim, https://www.mannheim.de/sites/default/files/2018-08/mannheim_2018.pdf for Mannheim, https://www.mannheim.de/sites/default/files/page/14449/15_feudenheim_2016.pdf for Feudenheim, https://mannheim.de/sites/default/files/page/14449/04_schwetzingerstadt_oststadt_2016.pdf for Schwetzingerstadt/Oststadt, last access October 2018.
[c] Own calculations based on regional data by the Statistisches Landesamt Baden-Württemberg, https://www.statistik-bw.de/GesamtwBranchen/VGR/20023010.tab?R=KR221 for Heidelberg and https://www.statistik-bw.de/GesamtwBranchen/VGR/20023010.tab?R=KR222 for Mannheim, last access October 2018.
[d] Own calculations based on data by the Federal Statistical Office and the statistical Offices of the Länder, Zensus 2011, https://ergebnisse.zensus2011.de/?locale=en#StaticContent:082220000000,BEG_4_4_7,m,table, last access October 2018.

Table A.2: Sample characteristics

	Total	**Heidelberg**		**Mannheim**	
		Bahnstadt	Neuenheim	Feudenheim	Schwetzingerstadt / Oststadt
Subjects (in #)	616	146	177	109	184
Age (in years)	35.6	29.0	38.1	47.2	31.5
Female (in %)	45.7	47.9	48.9	42.6	42.6
Income (in EUR)	2,087	2,027	2,117	2,550	1,832
Education (in years)	14.8	14.4	15.4	14.3	15.0
Religion (in % of respondents who state moderately or more)	45.8	44.9	47.9	48.1	42.9
Region (in years)	17.5	7.4	19.5	35.2	13.2
Neighborhood (in years)	8.9	1.6	10.8	20.6	5.9
Local Identity Index	-0.04	-0.12	-0.05	0.29	-0.16
Local Patriots (in %)	49	45	47	65	44

Table A.3: Sample characteristics by treatment

	LOW NO LABEL	LOW LABEL	HIGH NO LABEL	HIGH LABEL
Subjects (in #)	192	160	128	136
Age (in years)	34.9	37.2	37.0	33.2
Female (in %)	44.5	42.8	43.3	52.9
Income (in EUR)	2,107	2,156	1,877	2,176
Education (in years)	15.0	14.7	15.0	14.7
Religion (in % of respondents who state moderately or more)	49.5	42.5	48.3	43.4
Region (in years)	17.4	18.5	19.2	15.0
Neighborhood (in years)	8.6	10.2	10.1	6.6
Local Identity Index	-0.05	-0.01	-0.04	-0.06
Local Patriots (in %)	47.4	51.9	49.2	47.8

Notes: Means and proportions are reported by the four different treatments. We show the results of t-test on equality of means or of a chi2 test on equality of proportions of the respective variable of interest (column 1) between the NO LABEL as our base category and the three remaining treatments in a series of pairwise tests. There are no statistically significant differences in means or proportions between corresponding treatments and the NO LABEL condition.

Table A.4: Individual contributions, local patriots in MIX

	(1) q^p Private	(2) q^l Local	(3) q^r Regional	(4) q^p Private	(5) q^l Local	(6) q^r Regional
MIX	-0.61	-0.46	1.07*	-0.57	-0.56	1.13*
	(0.500)	(0.428)	(0.64)	(0.522)	(0.423)	(0.674)
LABEL	-0.42	0.75**	-0.32	-0.49	0.77**	-0.28
	(0.341)	(0.355)	(0.417)	(0.350)	(0.384)	(0.453)
MIX x LABEL	1.22*	-0.17	-1.05	1.34*	-0.11	-1.24
	(0.687)	(0.612)	(0.830)	(0.702)	(0.617)	(0.857)
Constant	2.47***	2.55***	2.98***	4.20***	1.77***	2.03***
	(0.262)	(0.249)	(0.299)	(1.068)	(0.971)	(1.331)
Controls	no	no	no	yes	yes	yes
Neighborhood FE	no	no	no	yes	yes	yes
# of observations	236	236	236	229	229	229

Notes: OLS regressions, $q^p, q^l, q^r \epsilon [0,8]$, with robust standard errors in parentheses; $*p < 0.1$, $**p < 0.05$ and $***p < 0.01$. The first three columns report the results of the basic models that only include the main treatment variables (HIGH and LABEL) as well as their interaction (HIGH x LABEL) as regressors. Columns (4) – (6) report results from regressions that contain additional control variables (age, female, income, education, religious, years of residency in the neighborhood, years of residency in the metropolitan region) as well as neighborhood fixed effects. Statistically significant results reported above are robust to jointly estimating regressions (2), (3) and respectively (5), (6) as seemingly unrelated regression equations.

Supplementary Material

Click here to download Supplementary Material: LevelingUp-SupMat_Rev2.pdf