Agency and structure

The role of individual social values and material interests in changing contribution rules to, and benefits from, a collective good

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Citation for published version (APA):
van Breemen, J. A. (2018). Agency and structure: The role of individual social values and material interests in changing contribution rules to, and benefits from, a collective good.

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CHAPTER 2
SECURING COOPERATION: INDIVIDUAL ATTEMPTS TO CHANGE THE CONTRIBUTION RULES

ABSTRACT

In this chapter, we experimentally investigate whether and how individuals attempt to change the formal rules which govern contributions to a team collective. Furthermore we investigate if an actual change of a contribution rule is facilitated by the possibility to communicate among team members. We first test the hypothesis that a rule change is initiated by individuals who perceive inconsistency between their social value orientations and the existing contribution rules. We find evidence that prosocial individuals, who value cooperation, attempt to change a rule mandating a low level of individual contribution. In line with our theoretical discussion, individuals are able to change formal contribution rules either by establishing new empirical expectations through social norms without formal enforcement, or by requiring the formal enforcement of a rule when informal attempts via norm change fail. We observe that an actual change of a contribution rule takes place with and without the possibility to communicate, thereby not obtaining evidence that communication influences an actual change of the rules.

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6 A modified version of this chapter is currently under Revise & Resubmit at the Journal of Institutional Economics (Gërxhani and van Breemen 2017. Social values and institutional change: An experimental study).
2.1. INTRODUCTION

An organization is an environment where formal institutions (i.e., rules or regulatory policies) and informal institutions (i.e., social norms) structure its members’ behavior.\(^7\)\(^8\) Formal rules and informal norms act in tandem and may either mutually reinforce one another or be in conflict (Nee and Ingram 1998). In this chapter, we focus on this interaction and we investigate, in particular, if individuals attempt to change the formal rules which guide their team interactions. Furthermore we study if an actual change of the rule is facilitated by communication among team members. Because of our focus on individual change attempts and team interactions, the rules and norms that affect team cooperation are of particular interest to our study.

The rules we study are the ones which prescribe individual contributions towards a team collective. When individuals are bound to cooperate in order to achieve a collective outcome, they face a social dilemma. Whether or not members contribute to the team collective, the benefits of the team collective are available to everyone in the team. Formal rules guide and structure this contribution within groups (Sewell 1998). However, not all rules adequately regulate cooperation, individual team members may for instance free ride on the contributions of other team members, leading to a breakdown of cooperation (Dawes 1980; Ledyard 1995; Olson 1965; Ostrom 2005; Reuben and Riedl 2013).

We address individual rule change attempts from the conceptual framework that structure and agency are not opposing forces but rather presuppose one another and are mutually constitutive (Giddens 1984). In examining the role of agency in institutional change, we are aware that reflexivity and purposeful action are common features in definitions of agency (Rapport and Overing 2000). Research tends to focus on individuals’ purposeful actions and the availability of resources. Recently, Lawrence, Leca, and Zilber (2013) argued that further investigation of the other feature of agency, reflexivity, that is the individual ability to internally deliberate upon external reality (Archer 2007), is needed. In this chapter we look at both.

\(^7\) We adopt the view of North (North 1990:4–5) regarding the distinction between organizations and institutions: organizations are groups consisting of individuals achieving objectives bounded by a common purpose, while institutions are the underlying rules of the game. Formal institutions are typically defined as rules or regulatory policies that are explicitly written down and enforced, either by sanctions from a third party or by the organization itself. Informal institutions are (social) norms, prescribing the expected appropriate behavior in a specific situation, and they are informally enforced through (social) rewards or punishment by peers (Coleman 1987; Elster 1989).

\(^8\) Henceforth, we use the concepts of norms and rules when referring to informal institutions and formal institutions, respectively.
At the theoretical level, we incorporate reflexivity and purposeful action into Nee and Ingram’s (1998) model of institutional change. Because we are interested in the role of individuals we focus on the micro- and meso-levels of their model. We contribute to their model by providing a detailed analysis of micro-interactions at the individual and team levels to address the issue of rule change. In this analysis, we assign an important role to individual values. Although they have been argued to be important (Parsons 1966), suggesting that individual values are ‘socially meaningful’ because they connect individuals with social structures (Hitlin and Pinkston 2013:320), ours is perhaps the first study to examine the role of individual values and their interaction with norms and rules in institutional change. It is through this interaction that an individual’s reflexivity becomes prominent.

Notably, the effect of the value-norm-rule interaction on rule change may depend on the existing structure at the meso-level (i.e., existing rules). To account for this possibility, we distinguish between two environments that vary depending on the mandatory rule of individual contributions to the team collective (e.g., Sewell 1998). Hence, we investigate an environment characterized by a high level of mandatory contribution rule and an environment characterized by a low level of mandatory contribution rule.

To illustrate, consider a rule which mandates a high level of individual contribution towards a team collective. This increases cooperation and the collective benefits (Barber and Simmering 2002), but it also constrains the agents’ autonomy. A more lenient rule, on the other hand, formally mandates a low contribution from individuals towards the team collective. This allows for more individual autonomy (e.g., Tyler and Lind 1992), but also for more free-riding on the contributions of team members (Ledyard 1995), which may lead to a breakdown of cooperation (Dawes 1980; Ledyard 1995; Olson 1965; Ostrom 2005; Reuben and Riedl 2013). These two formal rules may have distinct effects on the ways in which individuals respond to the interaction between their own values and these rules. For example, compared to a stricter rule, a more lenient rule might allow a more prominent role for agents’ values.

We thus derive hypotheses on how individual attempts to change formal rules are affected by social values, social norms, pre-existing rules and the interactions of these three. To test these hypotheses, we collect data in a controlled laboratory experiment. The experimental approach enables us to disentangle the rules, norms, values, and the underlying mechanisms of rule change attempts (Jackson and Cox 2013). In particular, this experimental approach provides optimal tools to eliminate possible confounding variables that typically make causal inferences difficult in both natural settings and case studies.

Researchers have argued that understanding institutional change requires a thorough and “finer-grained” analysis that considers the individuals concerned,
their actions, the ways they interact, and the norms and values that shape their behavior (Battilana, Leca, and Boxenbaum 2009:95). Our study aims to contribute toward research in this new direction.

Although some earlier research has investigated the emergence of formal rules through a new discourse (Maguire and Hardy 2006) or has considered the temporal conditions for rule emergence (Buhr 2012), the micro-process of rule change remains understudied (Nee and Opper 2014). A better understanding of the micro-process is important because formal institutions directly affect (un)equal outcomes in the workplace. Gaining a clearer understanding of the mechanisms through which formal rules are changed can provide insights on how to address such inequality. In the words of Elinor Ostrom (2005:132) “Rules are the tools, however, that fallible humans can use to try to change situations to achieve better outcomes.”

2.2. SOCIAL VALUES AND SOCIAL NORMS IN RELATION TO CONTRIBUTION RULES

2.2.1. A conflict between individual social values and the rules
Values can motivate social behavior (Hitlin and Piliavin 2004). Relevant examples are self-transcendence values, i.e., prosocial values, which reflect concern for others’ welfare and motivate cooperative behavior (Caprara, Alessandri, and Eisenberg 2012; Murphy, Ackermann, and Handgraaf 2011; Van Lange et al. 1997). These values conflict with self-enhancement values, i.e., proself values, which relate to pursuing self-interest and motivate the accumulation of personal wealth and power (ibid).

Individual social values are determined through socialization by family, generational peers, or social class (Bengtson 1975; Hitlin and Piliavin 2004), and through the selection and socialization tactics of the organization itself (Cable and Parsons 2001; Chatman 1991). Social values of an individual may be consistent or in conflict with the values of their team members. For example, some team members may have a prosocial value, emphasizing working together with others toward a common end or purpose (Chatman and Barsade 1995), while others with a proself value orientation may believe in maximizing their own welfare regardless of others’ welfare. In addition, the existing contribution rules and norms guiding team interactions may correspond to the values of some, but not all, members.

Values differ from norms and rules in various ways that are relevant to this study. First, values explicitly define a desired end state or outcome, such as the value of ‘equality for all,’ whereas norms and rules are in the form of expected behavior (Elster 1989). Second, while both a norm and a rule refer to specific
behavior in a specific situation, a value transcends specific situations (Rokeach 1973). Rules and norms both dictate behavior in specific (work-related) situations, such as how one ought to behave regarding the level of cooperation, an individual-held value such as ‘equality for all’ transcends these particular working situations and relates to a more general desired end state. Third, whereas values can be held by a single individual, norms and rules are always shared (Ostrom 2005). Finally, rules differ from both values and norms because they are explicitly written down and formally enforced, while norms and values are not.

These aspects point to the distinction between the personal nature of values and the social nature of norms and rules that is emphasized in (social) identity theories (Turner et al. 1994). Values are related to and incorporated into the self (Hitlin and Piliavin 2004), referring to people's self-identities and self-perceptions (Kouzakova et al. 2012); by contrast, norms and rules are related to the self in particular situations or social contexts. Reflecting on the relationship between the self and external reality, an individual thus compares her personal identity to her social identity.

In line with Archer's (2007) general argument, we refer to reflexivity as an inherent ability of all individuals to engage in internal deliberation of external reality. This reflection has the prerequisite that an individual sees both the properties of the self and those of the external reality as pertaining to the self (Archer 2007). We suggest that reflexivity constitutes an individual's evaluation of the relationship between personal social values and the rules of the organization. Both aspects pertain to the self, but on a different level: whereas values belong to the personal self, rules belong to the social self.

When an individual finds that the social values (i.e., personal identity) and rules (i.e., social identity) are congruent, his or her social identity becomes salient. This social identification leads to support for the institutions that “embody” the identity (Ashforth and Mael 1989:25). In contrast, when an individual finds that the social values and rules are incongruent, one would expect him or her to experience a conflict between the personal and social identity, making the shared social identity less salient (Turner et al. 1994). The increased awareness of the individual's personal identity could lead to less social identification and thus to diminished support for the institutions that embody the social identity. Some evidence indicates that individuals who experience a value-rule conflict take this conflict personally and perceive a greater difference between themselves and others (Kouzakova et al. 2012). Moreover, when individuals experience a value-rule conflict, they are less likely to consider compromising as a solution to this conflict (ibid). We conjecture that this situation increases the likelihood that such individuals will attempt to change the rules they are subjected to. Thus, we propose that an attempt to change a formal rule is more likely if an individual
experiences a value-rule conflict. More specifically, relevant to the rules which prescribe individual contributions towards a team collective, we propose that:

**Hypothesis 1.** Individuals are more likely to attempt to change the formal contribution rules when these rules are in conflict with their social values.

### 2.2.2. A rule change attempt is preceded by a norm change attempt

Crucial to understanding why and how individuals with a value-rule conflict are able to change formal rules is the fact that the rules are (re)produced through social interactions (Lawrence et al. 2013). Norms and rules form the structure that specifies not only how the individuals in the organization ought to interact to receive (non-)material rewards (e.g., status, salary) but also how they “compete” for the reproduction of those institutions (Rand and Nowak 2013:413). Thus, to understand how individuals with conflicting values attempt to change existing formal rules, we need to consider the relationship between an organization’s social norms and its formal rules. Because the rules we consider are the ones which prescribe individual contributions towards a team collective, we look at the social norms which guide behavior in the same domain.

To clarify, we focus on situations when individuals’ values are in conflict with the existing rules because, as argued by Nee and Ingram (1998), we expect that individuals will not attempt to change the rule when there is no conflict between their values and formal rules. This expectation is based on the argument that rules that are aligned with individual social values and interests are also typically aligned with the social norms that arise as a reflection of such values and interests. “When the formal rules are at variance with the preferences and interests of subgroups in an organization” (Nee and Ingram 1998:35), there are two possibilities: either the existing social norm aligns with the individual values or it is in agreement with the formal rule. In the former case, Nee and Ingram argue that such agents will typically find a way to circumvent the formal rules via “a decoupling of the informal norms and the formal rules of the organization” (1998:35). Thus, both are maintained, but formal rules exist only *de jure* and social norms *de facto*. Hence, there is no need for institutional change.

The other possibility is that existing social norms are in agreement with formal rules and in conflict with individual values (i.e., ‘preferences and interests’). In such a scenario, individual interactions within teams may give rise to ‘opposition norms’ which are resistant to the formal rules (Nee and Ingram 1998). Opposition norms “enable, motivate and guide collective action,” and are decoupled from the formal rules (Nee and Opper 2015:152). This second possibility describes an avenue along which individuals may attempt to address a conflict between their values and the formal rules. In short, we hypothesize that an individual experiencing a value-rule conflict where the prevailing norm sides with the
rule, will first attempt to change the social norm into an opposition norm. Complementing the previous hypothesis (H1), we conjecture that:

**Hypothesis 2.** Individuals who experience a value-rule conflict address this conflict by attempting to change the corresponding social norm.

But how do individuals attempt to change a social norm? Norms are implicit and “offer considerable scope for skill, choice, interpretation and manipulation” (Elster 1989:100). A norm has a two-sided ‘expectations component’: (a) individuals expect other team members to comply with it (empirical expectations); and (b) individuals believe that other team members expect them to obey the norm and may sanction transgressions (normative expectations) (Bicchieri 2006). Although they represent two distinct bodies of literature, these two components are somewhat analogous to the social psychology perspective on norms, which distinguishes between descriptive and injunctive norms (Cialdini et al. 1990). A descriptive norm refers to people's perception of the actual behavior of others, while an injunctive norm refers to people's perception of which behavior is appropriate in that specific situation (Aronson et al. 2010).

We add the argument of reflexivity to this discussion. When individuals experience a conflict between their personal and social identity, their shared social identity becomes less salient (Turner et al. 1994), and their individual uniqueness becomes more salient. While conformity to group norms is an aspect of psychological group membership in the former case, non-conformity to the norm is a way to express uniqueness. Agents can thus signal their non-identification with their team by not conforming to the existing norms (Irwin and Simpson 2013). In relation to the focus of our interest, prosel individuals can for instance defy a social norm prescribing a level of contributions by acting selfishly; by contributing less to nothing to the team collective. On the other hand, prosocial individuals can contribute more to the team collective than the contribution norm prescribes. Such deviant behaviour expands the set of salient forms of behaviour. These individuals ‘propose’ an alternative descriptive norm (Knight and Ensminger 1998). In practical terms, this means that by not behaving in line with expectations and displaying dissent or deviant behaviour instead, individuals can expand the set of descriptive norms.

Team members may approve of this deviant behavior when the alternative norm is in line with group goals or is beneficial to the group status (Teixeira et al. 2011). Furthermore, individuals who become aware of other descriptive norms are more likely to change their behavior accordingly (Aronson et al. 2010). When this
happens, a new norm may develop within the team. Thus, such deviant behavior may provide a path along which individuals can attempt to change existing norms.

If the attempt to change the norm is successful, then the individual’s personal values and the new social norm will be incongruent with the existing formal rule. Assuming a successful norm change, Nee and Ingram (1998) argue that an attempt to change the rule will be less likely because although the day-to-day practices are not consistent with the formal rule, they are viewed as a remediation of the rule’s outcomes, thus eliminating the immediate necessity of a rule change.

What happens if the attempt to change the norm is unsuccessful? In this case, individuals may attempt to change the formal rule directly if the system allows them to do so. Such a system is more likely possible in an organization characterized by a democratic structure in which all individuals have the ability and right to participate in rule making (Jacob 2015). In a democratic structure that allows for direct involvement, an individual can directly challenge the existing rule via voting: majority or unanimity rule voting (Walker et al. 2000). As shown below, our research design is based on such a democratic decision-making structure.

Research provides evidence that voting -when “binding for all involved”- may provide a successful way to establish socially optimal outcomes (Hauser et al. 2014:220). When, for instance, a majority within a team endorses a proposal to change a rule from a low level of mandatory contribution to a high level of mandatory contribution to the team collective, their voting for this rule change can overrule the votes of the minority. Additionally, when there is support for a rule change but insufficient levels of trust or reciprocity within a team, voting may provide individuals with reassurance that their “efforts are not futile” (Hauser et al. 2014:220). This reasoning yields the following hypothesis:

**Hypothesis 3.** If individuals do not succeed in changing the social norm, they will attempt to directly change the contribution rules by voting.

### 2.2.3. Communication facilitates an actual rule change

Finally, we turn our attention to the likelihood of an actual rule change. We thus examine the case in which an attempted norm change is unsuccessful and individuals revert to directly trying to change the formal rule. Such an attempt is more likely to succeed if individuals contest it through debate, which, in turn, can be facilitated through communication. Individuals can interpret, debate and contest existing rules, as one of the features of a formal written rule is its ability to serve as a focus for organizational discourse (March et al. 2000).

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9 We are aware that it takes more than information dissemination to change a norm (Gërxtani and Bruggeman 2015), but we consider it as a necessary though not sufficient step.
Communication plays an important role in achieving “a common understanding of the problems jointly faced” (Ostrom 2005:65). Moreover, one of the prerequisites for institutional change is the presence of a coalition in favor of change (DiMaggio 1988). The formation of a coalition is facilitated by the ability to communicate not only with the like-minded but also with opponents (to convince or persuade them). Experimental research shows that individuals’ ability to communicate improves the ability of groups to overcome issues of cooperation (Ostrom 2005:87). We therefore propose that the possibility to communicate and thus provide arguments increases the likelihood of an actual rule change following an attempt. This reasoning leads to the following hypothesis:

Hypothesis 4. A change of a contribution rule is more likely when individuals are able to communicate than without communication.

2.3. METHOD

2.3.1. Research design

We tested our hypotheses with data collected in a controlled laboratory experiment in which we examined the nature of interactions in two public goods games (PGG1 and PGG2) (Fehr and Gächter 1999). Before PGG1 we measured participants willingness to take risks, their social value orientation (Van Lange et al. 1997), and the social norm applicable to contributions in a public good situation. We explain each measure in more detail in the next section.10

The public goods game is appropriate for our research interests because it captures aspects of cooperative behavior in teams; the use of the (voluntary) contribution mechanism to elicit contributions to a public goods directly mirrors the expended effort in an employment situation (Croson 1995). Second, the PGG represents an experimental paradigm where formal rules can be implemented (Ledyard 1995) and thus institutional change can be investigated. This game allows us, on the one hand, to vary the formal rule of interest (i.e., the rule on minimum contribution) within the structure of majority voting and on the other hand, to measure the social norm on what one ought to contribute to the public good.

The core of our experiment consisted of two 10-round PGGs (PGG1 and PGG2) where individuals were in the same team of five. The term ‘team project’ was purposefully chosen to mimic a cooperative environment. In each round of the game, each individual was endowed with a fixed 10 points resource, which

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10 We also measured participants’ emotions as part of another investigation on the role of guilt on institutional change.
they could (partially or completely) contribute to a ‘team project’. In each round the total team contribution was made public to the team members, but individual contributions were not visible to other team members. It was made clear to the participating individuals that by design, each point contributed to the team project would yield a payoff of 0.4 points to every team member, irrespective of their own contributions. This yielded an individual income for each round calculated as following:

\[
10 \text{ points} - \# \text{ points contributed to the team project} + 0.4 \times \text{total team contribution.}^{11}
\]

We used a 2 x 2 between subject design (Rule/Communication). In the first treatment Contribution rule we varied the formal rule specifying the mandatory contribution level in PGG1. The second treatment Communication varied whether or not communication with other group members was allowed.

For PGG1 participants were randomly assigned to a Contribution rule treatment, the two rules were: Rule 2, where a minimum contribution of two points (out of ten possible points) was mandatory in each round; and Rule 8, where a minimum contribution of eight points (out of ten possible points) was mandatory in each round. These rules were strictly enforced, participants were unable to contribute less than the treatment called for. By introducing a minimal amount of contribution in Rule 2, and allowing for some freedom in Rule 8 we do justice to the fact that in organizational environments the formalized control (cf. Sewell 1998) is either at least somewhat present (Rule 2), or not omnipresent (Rule 8). Note that the Rule 8 environment left the participants with very little freedom to choose (they can contribute 8, 9, or 10 points per round). As clarified below, this treatment provides us with a useful baseline to which we can compare the more interesting Rule 2 environment.

After participating in the first public good game (PGG1), all participants were given the option to change the existing rule on the minimum mandatory contribution level for a second public good game (PGG2) which would start thereafter. To be able to do so, they could initiate a call to vote -at a cost- to replace Rule 2 with Rule 8, or vice versa, depending on treatment. If no team member called for a vote, there was no voting procedure and the rule mandating the minimum contribution level did not change for PGG2. All participants were

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11 To illustrate, consider the following example of a round in the PGG. In a team of five members, one member contributes 5 points to the team project, two members contribute 2 points each, and the other two members contribute 8 points each. The total team contribution is 25 points. The income of the first member is \((5 + 0.4 \times 25) = 15\) points; the income of the two team members who behaved in an “uncooperative” manner is \((8 + 0.4 \times 25) = 18\) points each; and the income of the two members who behaved in a “cooperative” manner is \((2 + 0.4 \times 25) = 12\) points each.
informed that in this case in PGG2 the same Contribution rule as in PGG1 was implemented. If at least one member of a team indicated ‘yes’ on call to vote then a voting procedure (majority vote) started.

The start of this voting procedure following a call to vote differed depending on the treatment Communication to which participants were randomly assigned. In the treatment Communication allowed team members were allowed to communicate with one another during 90 seconds through a chat box before the actual vote. In the treatment Communication not allowed participants went immediately after the call to vote to the actual vote without the possibility to communicate.

If a majority subsequently voted in favor of a change, then the Contribution rule changed and participants were informed that their participation in PGG2 would take place under the new rule. If a majority in favor of a change was not reached then the minimum contribution level did not change and participants were informed that in PGG2 the same Contribution rule as in PGG2 was implemented.

2.3.2. Participants and procedure
The experiment was executed in June and October 2014 at the CREED Laboratory of the University of Amsterdam and consisted of a pre-study (explained in 2.3.3 below) and a main experiment. We used the CREED participant pool database consisting of more than 2,000 potential participants. All Dutch-speaking students received an invitation to sign up and participation was on a first-come, first-serve basis. A total of 220 individuals participated in the main experiment.12 A total of 215 participants (124 men and 91 women, M_age = 22.62, SD = 3.16) are included in the data analyses. They participated in one of 17 sessions of the main experiment, in which they were randomly assigned to one of the four treatments cells.

Sessions lasted approximately ninety minutes and consisted of two parts, each with multiple tasks. Upon arrival, participants were randomly seated at separate computer cubicles. Participants completed a risk measure and were randomly and anonymously paired for the social value measure (SVO1). This was followed by a measure of the social norm relating to contributions in a public good situation. Next, they were randomly assigned to a team of five for the first PGG (anonymous matching), and remained in this team for the second PGG. Participants were unaware during PGG1 that a second public good game would follow. They were informed that the experimental session consisted of multiple tasks and rounds, but they did not know how many rounds or which tasks would follow. Immediately after PGG1, all participants’ social value orientations were again measured (SVO2). After a call to vote and the voting itself, as described above,

12 Due to a computer crash in the 12th session, the data for 5 participants could not be collected.
PGG2 started, with the same rule as before if there was no call to vote and with a new rule if there was a call for vote and if the majority supported the new rule.

Instructions were given at the beginning of each task. All participants received the same general instructions and had to indicate whether they understood these instructions before the experiment could proceed. The instructions regarding the level of the mandatory minimum contribution varied depending on the treatment Contribution rule in PGG1 (each round), and on the result of the voting procedure in PGG2 (if a call to vote for a rule change took place). The instructions also varied depending on whether or not Communication before voting for a rule change was possible. Each session concluded with a short questionnaire on the participants’ socio-demographic characteristics. Hereafter they were thanked for their cooperation. The experimenter called each participant separately to the back of the room to receive their payment without disclosure of the payments of the other participants.

Payoffs
Participants were paid in cash privately at the end of each session, and earnings were dependent on their choices. Their earnings in the experiment were in ‘points’ and exchanged for euros at a rate of €1 per 100 points. The participants’ payoffs were based on their decisions on several measures. Next to a bonus for providing the modal answer to the norm measure, one of their choices for each of the social value orientation measures was chosen randomly for payment. Additionally, participants received the points that they earned during PGG1 and PGG2, and they lost points for the times that they asked for a call to vote. Participants earned on average €29.30, including a €7 show-up fee.

2.3.3. Measures

Social values
We assessed participants’ social value orientations using the triple-dominance measure (TDM)(Van Lange et al. 1997). The measure consists of nine items, each containing three distinct outcome distributions with points for oneself and an (anonymous) paired other. Each outcome distribution represents a specific social value orientation. Consider for example the first outcome distribution, the choice between alternatives A, B, and C in Figure 2.1.

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13 See Appendix A for a version translated into English.
14 We used anonymous RING matching, such that for participant 1 “the other” is participant 2, for 2 it is 3, and so forth. For the last participant “the other” is participant 1.
You get 480 540 480  
The other gets 80 280 480

Option A represents the competitive orientation, i.e., maximizing the difference between own outcomes and other's outcomes. Option B represents the self-interested orientation, i.e., maximizing own outcomes, and option C represents the prosocial orientation, i.e., equal distribution of outcomes (Van den Bergh et al. 2006). The TDM categorizes individuals into one of three categories—competitive, self-interested, or prosocial—if at least six out of nine choices can be consistently attributed to one of these motives, otherwise they are uncategorized.

We combined the self-interested and competitive categories into a single category, which we call the 'proselfs', in line with earlier research (Eek and Gärling 2008). The rationale behind this is that both self-interested and competitive participants seek to enhance their own outcomes, either in an absolute sense (self-interested) or in a relative or comparative sense (competitive) (Van Lange et al. 1997). This way, we had proself and prosocial categories as well as a group of participants who are uncategorized. We categorized some participants in this last group as proself if they had made at least six choices consistent with either self-interested or competitive motivations (thus making six consistent choices for the combined category).

Although this measure correlates reliably with behavior (Eek and Gärling 2008), we measured the social value orientation before and after PGG1 to assess consistency. Of the 215 participants, 174 (81%) were categorized in the same social value category by the triple-dominance measures elicited at time 1 (SVO1) and time 2 (SVO2). We used Cohen's κ to determine if there was agreement between the two SVO measures' classification of our participants as prosocials, proselfs, or as uncategorized. There was good agreement between the measures, $\kappa = .643$ (SE = .05, 95% CI, 0.545, 0.7414). Because of this agreement, we based our analyses on the first measure, SVO1.

In line with earlier research (Stouten et al. 2005), participants who remain uncategorized are not considered in our analyses. Based on SVO1, 20 participants (9.3%) remained unclassified because they made fewer than six consistent choices. Because social values play a central role in our theoretical framework, we do not consider the 20 participants who remained unclassified and perform our analyses.

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13 There is discussion about the interpretation of Cohen’s $\kappa$; Landis and Koch (1977) for instance consider a Cohen’s $\kappa$ between 0.61–0.80 as ‘substantial’, while Fleiss (1981) considers a Cohen’s $\kappa$ between 0.40–0.75 as ‘fair to good’. The observed accuracy of 81% with an expected accuracy of 47% based on the contingency table/matrix, leads us to interpret our Cohen’s $\kappa$ as ‘good’.
with the remaining 195 participants (112 men and 83 women, $M_{age} = 22.65$, $SD = 3.24$).

**Conflict between value and rule**
The measured social values (captured by SVO1) allow us to define a conflict between values and the existing formal rule i.e., Contribution rule (Rule 2 vs. Rule 8 of the mandatory contribution level). In specifying those experiencing a conflict, we considered only participants who were extreme in their values, those who consistently (nine out of nine choices in the triple-dominance measure) chose either the proself or the prosocial option. We believe these participants experience a conflict if these (extreme) values are of the opposite direction to what is required by the rule in place. They experience the least amount of value congruence, defined as the degree to which the organization and its members agree on values about group goals and tasks (Chatman 1989; Jehn, Chadwick, and Thatcher 1997). We created a variable Conflict to represent these value-rule conflicts. This is summarized in Table 2.1.

**Table 2.1. Value-Rule Conflict**

<table>
<thead>
<tr>
<th>Rule</th>
<th>Norm</th>
<th>Extreme Social value</th>
<th>Value-rule conflict</th>
<th>Conflict category</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Rule 2)</td>
<td></td>
<td>prosocial</td>
<td>Yes (N = 28)</td>
<td>1</td>
</tr>
<tr>
<td>Low level contribution</td>
<td>5</td>
<td>proself</td>
<td>No (N = 60)</td>
<td>3</td>
</tr>
<tr>
<td>(N = 119)</td>
<td></td>
<td>no extreme social value</td>
<td>No (N = 31)</td>
<td>3</td>
</tr>
<tr>
<td>(Rule 8)</td>
<td></td>
<td>prosocial</td>
<td>No (N = 24)</td>
<td>3</td>
</tr>
<tr>
<td>High level contribution</td>
<td>5</td>
<td>proself</td>
<td>Yes (N = 34)</td>
<td>2</td>
</tr>
<tr>
<td>(N = 76)</td>
<td></td>
<td>no extreme social value</td>
<td>No (N = 18)</td>
<td>3</td>
</tr>
</tbody>
</table>

*Note: The final column assigns individuals into one of three categories: (1) prosocial individuals with a value-rule conflict because they have an extreme value (column 3) that conflicts with the Rule 2 (column 1); (2) proself individuals with a value-rule conflict because they have an extreme value (column 3) that conflicts with the Rule 8 (column 1); and (3) participants without a value-rule conflict. A value is extreme if all nine allocation choices in the SVO1 are consistent. Participants who cannot be classified as either prosocial or proself (N = 20) are not included. There is no significant difference between the number of proselfs and prosocials in Rule 2 and Rule 8 ($z = -1.074, p = .283$).*
Chapter 2 - Securing Cooperation: Individual Attempts to Change the Contribution Rules

Contribution norm
To enable a comparison among values, norms, and rules, we needed a measure of the relevant social norm or ‘the expected behavior, specifying how one ought to behave’ (Interis 2011) with respect to contributions towards the ‘team project’. Moreover, we needed to ensure that our participants have a shared knowledge of this norm. We were able to do so by using an adapted version of the method introduced by Krupka and Weber (2013), identifying the norm through a coordination game.

To avoid order effects, we elicited the contribution norm as follows. We conducted a pre-study prior to our main experiment, in which participants were presented with the instructions of the PGG to be used later in the main experiment. We asked the participants in the pre-study to predict which contribution to the team project would be considered most socially appropriate (a number between zero and ten points). This selection was incentivized as follows. Any participant who chose the modal response (i.e., the most frequently chosen response) earned 500 points. By rewarding an estimation of the modal response, we did not elicit the participants’ own preferences but rather asked them to match the responses of others. In this way, the participants played a matching coordination game (Schelling 1960) in which they had to anticipate the extent to which others would rate an action as most socially appropriate (Krupka and Weber 2013). Our norm measure captures two important features of a social norm: one concerns what is considered socially appropriate and the other addresses the social consensus through a coordination game (Bicchieri 2006; Krupka and Weber 2013).

The pre-study modal response of what would be considered most socially appropriate was five points (out of ten points). In the main experiment, we presented the participants with the same pre-study instructions and asked them to indicate their own beliefs about which contribution to the team project the pre-study participants had regarded as most socially appropriate. Again, we provided a 500-point bonus for correctly estimating the modal response. This task served to measure the beliefs held by our participants in the main experiment about the prevalent norm. Subsequently, we disclosed to all participants in the main experiment that a social norm of contributing five points to the team project had been considered most socially acceptable by those who took part in the pre-study.

Note that our choice of this method is driven by our interest in an endogenous formation of a social norm and how that ultimately relates to the formal rules governing a group or an organization.

The pre-study was executed in May 2014 at the CREED Laboratory using an invitation method similar to that used in the main experiment. A total of 23 individuals participated in this study, including 14 men and 9 women (M_age = 23.13, SD = 3.85). The session lasted approximately 20 minutes. The participants earned €8.52 on average, including a €7 show-up fee.
This revelation of the modal response (of the pre-study) served to create a shared understanding of the prevalent norm for the environment of the main experiment, which captures the third important feature of a social norm (Interis 2011).

**Norm change attempt**
As every participant was aware of the contribution norm, we expect that those who do not conform to the norm might be proposing an alternative descriptive norm (Knight and Ensminger 1998). Hence, we consider individual contributions in the first round as a signal to the team members of whether an individual conforms to the norm. Team members who become aware of this alternative descriptive norm are more likely to change their behavior accordingly (Aronson et al. 2010), as demonstrated in the case of descriptive cooperative norms (Irwin and Simpson 2013). Though only aggregate group contributions are made known at the end of a round, this information provides a strong signal of the extent of norm compliance within the group. In our analyses of the Rule 2 treatment, we measure norm change attempts as individual contributions in the first round of PGG1 that deviate from the norm of five points.18

**Rule change attempt**
After PGG1, the participants were given the opportunity to attempt a change of the formal rule (Rule 2 or Rule 8, depending on the treatment) by initiating a call to vote for a change of the existing rule. This was implemented by asking the participants to indicate ‘yes’ or ‘no’ to whether they would like to call for a vote. The initiation of a vote costed 10 points, irrespective of others’ decisions. This amount reflects the observation that challenging an existing rule in the world outside of the laboratory is costly, for example, because of possible tangible sanctions. In the experiment, voting occurred if at least one team member called for a vote.

**Actual rule change**
Depending on the Contribution rule treatment, participants voted for a change of the existing rule (Rule 2 or Rule 8). A vote for a rule change (yes/no) is thus implemented by voting for the opposite rule to the one determined by the treatment. For an actual rule change to occur, a majority vote (three out of five) was necessary. An actual rule change is thus defined as the switch from the rule determined by the treatment to the opposing rule.

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18 In the Rule 2 treatment we look at upward deviations from five points because of our focus on a rule change from a minimum contribution of 2 to 8 i.e., a conflict between an (extreme) prosocial value and Rule 2. In the Rule 8 treatment our focus is on a rule change from a minimum contribution of 8 to 2. Here downward deviations from five points are not possible due to the enforcement of the rule.
Communication
In the treatment Communication allowed, the participants were allowed to communicate through a chat box for ninety seconds after the call to vote and before the actual vote. The participants were informed of this opportunity before they chose whether to call for a vote. All groups who were in this treatment did communicate. Logically, in the treatment Communication not allowed participants were unable to communicate.

Risk
An individual’s willingness to take risks positively influences the likelihood of organizational rule breaking (Morrison 2006). We assessed the participants’ general willingness to take risks (their ‘risk attitude’) to control for this in our analyses. We asked the participants to answer the question “How willing are you to take risks, in general?” on a 11-point Likert scale ranging from 0 (not at all) to 10 (very much) (Dohmen et al. 2011).

2.4. RESULTS
2.4.1. Descriptives
Socio-demographics
We investigated all our measures for differences related to the socio-demographics of our participants. We found no significant differences regarding our participants’ gender, age, study, or job for the norm measure and for our dependent variable: the rule change attempt. We did find a gender difference in risk-taking attitudes: men ($M = 6.71, SD = 1.51$) generally reported more willingness to take risks than women did ($M = 5.94, SD = 1.70$), $t = 3.358, p = .001$. We consider this difference in subsequent analyses.

Social values
Figure 2.2 summarizes our categorization of the participants. Based on SVO1, 20 participants (9.3%) remained unclassified because they made fewer than six consistent choices. Of the 195 participants, 122 (63%) were proselfs, and

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19 An ANOVA-test showed an effect of age on the mean contributions in the PGG1 ($F(3, 193) = 4.040, p = .008, \eta^2 = 0.06$): Chi-square analysis revealed a difference in the distribution of the various ages across treatments ($\chi^2 (9, N = 194) = 24.865, p = .003, \text{Cramér’s } V = .207$). Also for social value orientations (SVO1), age seemed to have an effect: in the group of 20- to 23-year-old participants, more individuals had a proself value orientation ($\chi^2 (6, N = 194) = 7.985, p = .046, \text{Cramér’s } V = .203$). We include age and gender as control variables in our analyses. Our results, reported below, remain significant after excluding age and gender.
73 (37%) were prosocials. Most of those classified were ‘extreme’ in that they chose consistently nine out of nine times; this holds for 94 of the proselfs (77.0%) and 52 of the prosocials (71.2%).

**Figure 2.2. Social value orientation (SVO1)**

![Bar chart showing frequency of prosocial and proself classifications.](chart1.png)

*Note:* Bars show the frequency of participants classified as prosocial or proself in the first measure (SVO1). A participant is classified as prosocial (proself) if (s)he chose the prosocial (self-interested or competitive) option at least six out of nine times. The classification is ‘extreme’ if the option was chosen nine out of nine times.

**Contribution norm**

Recall that in the pre-study, the modal response as to the shared understanding of the socially appropriate contribution was to contribute five points. Figure 2.3 shows the distribution of responses by those in the main experiment answering the question of what they thought had been the modal response in the pre-study. 34% of the participants correctly estimated the modal pre-study response to be five.

**Figure 2.3. Contribution norm measure**

![Histogram showing distribution of answers.](chart2.png)

*Note:* Bars represent the distribution of answers (in percentages) in the main experiment to the question “Which contribution to the team project do you think the participants of our earlier experiment find most socially appropriate?”.
An individual’s beliefs about the prevalent norm could be affected by his or her own values. Indeed, the mean norm reported by the prosocials in our data was slightly higher than that reported by proselfs ($M = 6.58$, $SD = 2.01$ and $M = 6.43$, $SD = 2.31$, respectively), but a Mann-Whitney U-test revealed no significant differences ($z = -0.912$, $p = .362$, two-tailed).

### 2.4.2. Analyses

#### 2.4.2.1. Attempt to change the rule: a value-rule conflict

We started the analyses with a test of Hypothesis 1, which predicts that individuals are more likely to attempt to change the contribution rule when this rules is in conflict with their social values. To account for the constraints imposed by the Contribution rule treatment, we conducted separate analyses for the Rule 2 and Rule 8 environments. Recall that our ‘Conflict’ variable allows us to distinguish participants with and without a conflict (see Table 2.1).

First, we analyzed the difference in rule change attempts by individuals with and without a value-rule conflict in the Rule 2 environment. As shown in Table 2.1, of the 119 participants in this treatment, 28 (23.5%) had such a conflict. These participants are consistently prosocial while the formal rule is ‘proself’. To test Hypothesis 1, we investigated whether experiencing a conflict affects the likelihood of calling for a vote to change Rule 2 to Rule 8. Table 2.2 provides the results of a logistic regression of the call to vote (i.e., rule change attempt) on the value-rule conflict variable, risk, gender and age. The results reveal that a value-rule conflict is a strong and significant predictor of a rule change attempt. None of the controls have a significant effect on the call to vote.
A similar analysis for the Rule 8 treatment shows no significant effect of having a value-rule conflict on the attempts to change Rule 8 to Rule 2 (Table 2.3). Of the 76 participants in this treatment, 34 (44.7%) had an extreme proself value orientation while facing a ‘prosocial’ formal rule. However, they were not more likely than those without a conflict to attempt to change the rule. The regression also shows that attempting this rule change is positively correlated with one’s willingness to take risks. Further analysis showed that participants with an extreme proself value orientation displayed a lower willingness to take risks compared to those participants without a conflict ($M = 5.74$, $SD = 1.71$ and $M = 6.64$, $SD = 1.45$, respectively, $t(74) = 2.507$, $p < .05$, two-tailed). Although this effect of our control is interesting, it is beyond the scope of this chapter.

The results in Tables 2.2 and 2.3 show that the role of a value-rule conflict in individual attempts to change formal rules depends on the environment. In our setting, a value-rule conflict is a driver for rule change when the rule mandates a low level of contribution. Hypothesis 1 is thus partially supported.
Table 2.3. Rule change attempts Rule 8

<table>
<thead>
<tr>
<th></th>
<th>$B$</th>
<th>$SE$</th>
<th>$OR$</th>
<th>CI(OR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Value-rule conflict = Yes</td>
<td>.775</td>
<td>1.187</td>
<td>2.171</td>
<td>[.212, 22.251]</td>
</tr>
<tr>
<td>Risk</td>
<td>1.817**</td>
<td>.639</td>
<td>6.153</td>
<td>[1.758, 21.537]</td>
</tr>
<tr>
<td>Age</td>
<td>-.021</td>
<td>.198</td>
<td>.979</td>
<td>[.664, 1.443]</td>
</tr>
<tr>
<td>Gender = Female</td>
<td>2.460</td>
<td>1.361</td>
<td>11.709</td>
<td>[.813, 168.594]</td>
</tr>
<tr>
<td>Constant</td>
<td>-17.142</td>
<td>7.051</td>
<td>.000</td>
<td></td>
</tr>
</tbody>
</table>

$\chi^2 = 18.315, df = 4, p < .01$

Nagelkerke $R^2$ 50.7%

Hosmer & Lemeshow test $p = .333$

Classification 93.3%

Notes: The results are presented for the Rule 8 treatment of a logistic regression of a rule change attempt (call to vote yes/no) in the Rule 8 treatment on value-rule conflict, risk, gender, and age. Reference categories are Value-rule conflict = No, and Gender = Male.

** $p < .01$ (two-tailed test); $N = 76$.

2.4.2.2. Attempt to change the social norm first

We further hypothesized that individuals who experience a value-rule conflict in a team where the norm aligns with the formal rule, try to change the corresponding social norm first (Hypothesis 2). Recall that we captured a contribution norm change attempt by considering first-round contributions in PGG1. More specifically, in the Rule 2 treatment a norm change attempt refers to first-round contributions deviating upwards from the contribution norm (i.e., the participant contributes more than five points). In the Rule 8 treatment, the participants could not deviate below the norm of five because of the required minimum contribution of eight points. We therefore focused our analyses on the Rule 2 treatment.

We had 28 cases of individuals with a value-rule conflict and 91 without such a conflict (see Table 2.1). Of the 28 participants with a conflict, 17 (60.7%) attempted to change the norm, while 34 (37.4%) of those without a conflict attempted to do so. This difference in proportions is significant at the 5% level (Fisher’s exact test, $p = .05$). Therefore, individuals experiencing a value-rule conflict do indeed attempt to change the norm first, providing thus empirical support for Hypothesis 2.

20 The magnitude of the odds ratios and the confidence intervals surrounding them for value-rule conflict, risk, and gender suggests separation in the data. A LR with penalized maximum likelihood estimation and corresponding penalized likelihood ratio tests (Firth method: Firth 1993; Heinze and Schemper 2002) showed however no major differences in coefficients or in $p$-values from the standard LR.

21 Recall that those without a conflict include prosocials who were not completely consistent in choosing the prosocial option in SVO1. It is however possible that some of these individuals also experienced some conflict between their value and the rule.
2.4.2.3. A direct attempt to change the rule

Next, we investigated whether the outcome of a norm change attempt affects the likelihood of a subsequent attempt to change the contribution rule. We hypothesized that when a norm change attempt fails, individuals attempt to change the formal contribution rule directly via voting (Hypothesis 3). Again, we focused on the Rule 2 treatment because norm change attempts are not possible in Rule 8. We considered a norm change to be successful when groups reached a mean contribution of eight points or higher in all ten rounds of the first public goods game. In Rule 2, attempts to change the norm were observed in 25 of the 26 groups. The attempt succeeded in only three groups (12%).

Hypothesis 3 states that if individuals do not succeed in changing the norm, they will attempt to directly change the contribution rule via voting. To test this conjecture, Table 2.4 provides the results of a logit regression of the call to a vote on the same set of regressors as in Table 2.2, as well as a dummy variable indicating that a norm change attempt had not succeeded. The coefficient for this variable is large and statistically significant, whereas the other coefficients show only small changes compared to those displayed in Table 2.2.

<table>
<thead>
<tr>
<th></th>
<th>B</th>
<th>SE</th>
<th>OR</th>
<th>CI(OR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Norm change = No</td>
<td>1.683*</td>
<td>.809</td>
<td>5.384</td>
<td>[1.104, 26.264]</td>
</tr>
<tr>
<td>Value-rule conflict = Yes</td>
<td>1.074*</td>
<td>.484</td>
<td>2.928</td>
<td>[1.135, 7.555]</td>
</tr>
<tr>
<td>Risk</td>
<td>.200</td>
<td>.133</td>
<td>1.222</td>
<td>[.941, 1.586]</td>
</tr>
<tr>
<td>Age</td>
<td>-.043</td>
<td>.133</td>
<td>.957</td>
<td>[.838, 1.094]</td>
</tr>
<tr>
<td>Gender = Female</td>
<td>.565</td>
<td>.421</td>
<td>1.759</td>
<td>[.771, 4.015]</td>
</tr>
<tr>
<td>Constant</td>
<td>-2.710</td>
<td>2.005</td>
<td>.067</td>
<td></td>
</tr>
</tbody>
</table>

\(\chi^2 = 13.633, df = 5, p < .05\)

Nagelkerke R\(^2\) 14.6%

Hosmer & Lemeshow test \(p = .237\)

Classification 65.5%

Notes: The results are presented for the Rule 2 treatment of a logistic regression of a rule change attempt (call to vote yes/no) on value-rule conflict, risk, gender, age, and whether a successful norm change occurred. Reference categories are Norm change = Yes, Value-rule conflict = No, and Gender = Male.

\* \(p < .05\) (two-tailed tests); \(N = 119\).

We chose this threshold because it implies that the minimum contribution level of eight points is reached without a formal rule. This is a rather high threshold, as one could argue that it takes several rounds for norm change attempts to succeed. Our choice makes it more difficult to find support for Hypothesis 3.
This result provides support for Hypothesis 3; individuals in groups in which a norm change attempt failed were more likely to attempt a contribution rule change directly. Of course, these groups included members who did and did not attempt to change the norm. Our expectation is that those who did make an attempt to change the norm but failed at the group level would subsequently attempt to change the rule. The data support this assertion: 59.1% of the participants who first attempted to change the norm tried to change the rule later, whereas this was the case for only 34.4% of those who did not attempt a norm change ($z = -2.496, p = .013$).

2.4.2.4. Communication and an actual rule change
Finally, we expected a change of the contribution rule to be facilitated by communication (Hypothesis 4). Whether communication has this effect may depend on the existing rule which guided interactions. For example, the participants in Rule 8 might feel hesitant to communicate because a norm change to Rule 2 would signal a proself value (which they may not want to share). We therefore considered the two rule treatments separately. To fully utilize the individual-level data that we obtained, we considered individual votes on whether to change the rule (treating the cases where no one called to vote as a vote against the change).

In Rule 2, 79.7% of the (59) participants in the treatment without communication were in favor of a rule change, and 86.7% of the (60) participants in the treatment with communication were in favor. The difference is not significant at conventional levels (Fisher’s exact test, $p = .337$). These percentages are, respectively, 7.9% and 2.6% in Rule 8, which are also not significant (Fisher’s exact test, $p = .615$). These results do not support Hypothesis 4.

2.5. CONCLUDING DISCUSSION
In this study, we address the issue of a formal rule change by investigating the micro-processes of individuals’ values, norms and actions within the constraints and opportunities implied by exiting formal contribution rules. We find evidence that a rule change is more likely initiated by individuals who have prosocial values

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23 This result is not affected by the assumption that individuals in groups who do not vote oppose the change. If we treat such individuals as missing values, the percentage in favor of change is 94.0% in groups without communication and 96.3% in groups with communication. This difference is statistically insignificant (Fisher’s exact test, $p = .670$).

24 In Rule 8, omitting the groups without a vote yields 15.8% in favor of change when there is no communication and 11.1% when there is communication. The difference is again statistically insignificant (Fisher’s exact test, $p > .999$).
and who experience a conflict between these values and rules that promote low levels of contribution to a team collective.

Moreover, we observe that such individuals (who experience a value-rule conflict) first attempt to change the contribution norm they disapprove of; they do so by signaling a willingness to deviate from it. Note that attempting a norm change by deviating from it can be costly for individuals because of the possible social costs, such as ostracism or derogative reactions from team members. In our experiment, deviating from the norm towards a more prosocial direction is costly because of the nature of the public goods game: while the income of other team members increases, the deviator’s income decreases.25

In spite of many attempts to change the contribution norm, they often fail. Our results indicate that if a norm change attempt fails, individuals try to change the rule directly via voting when given the opportunity to do so. A rule change attempt after a failed norm change attempt entails an additional loss of income because of the costs associated with it (e.g., in our experiment, these are the costs related to calling for a vote). Nevertheless, individuals in our study not only deviated from the existing norm in their attempts to change it but also followed through with a rule change attempt after the norm change had been unsuccessful.

The results also show that a successful norm change attempt is generally not followed by a subsequent rule change attempt. This confirms theoretical arguments proposed in the literature that new descriptive norms can become self-reinforcing and can render a change in formal rules unnecessary (Irwin and Simpson 2013; Nee and Ingram 1998).

We did not find evidence that communication facilitates a successful rule change, which is rather surprising because communication between members of a team has proven to solve cooperation problems in earlier research (Ostrom 2005). We thus particularly expected that a rule change to a rule with a higher contribution level, and hence more cooperation, would be facilitated by it. In fact, what we observed is that the majority of those voting are in favor of a rule change irrespective of whether they were able to communicate beforehand. One possibility is that participants are familiar with the environment characterizing the social dilemma game we applied. A call to vote for a change in the minimum contribution level may be informative in itself without the need for further

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25 To illustrate, consider the following examples of a round in the Rule 2 PGG1:

1. All team members contribute in accordance with the norm (5 points); consequently, they all earn an income of 15 points (= 5 + 0.4*25). (2) One individual contributes 10 points (deviating from the norm towards a prosocial direction). The other team members contribute 5 points each (conforming to the norm). The total team contribution is 30 points. The income of the first individual is 12 points (= 0 + 0.4*30). The income of the other team members is 17 points each (= 5 + 0.4*30).
discussion. If this were the case, communication would have no effect. More research is however needed to investigate this finding further.

Overall, there is an asymmetry in our results across the two institutional environments that we examined: rule change attempts are both more frequent and more successful when changing a rule from low to high mandatory contribution levels than vice versa. Very few individuals who experienced a conflict between their proself values and a rule mandating a high level of individual contribution attempted to change the latter. This result is however not surprising if we consider the nature of the public goods game in our experiment. Self-interested individuals, in this case proself individuals, act in a way that maximizes their (economic) well-being (Van Lange et al. 1997). In our study, the rule mandating a high level of individual contribution ensured not only an equal and prosocial distribution of wealth but also efficiency (Dasgupta and Heal 1979). As a consequence, a formal rule that promotes such an income distribution is expected to be supported by proself individuals.

Finally, a social dilemma game such as the public goods game used in this study is a well-established experimental paradigm for modeling social decision-making (Ledyard 1995), and we believe it to be a useful tool for studying the agency of institutional change. There are, however, obvious avenues for further research. For example, institutional change might occur in interactive environments other than the social dilemma that we presented, and may take on different patterns accordingly. In addition, our experiment enabled individuals to directly vote on formal change. This is not necessarily realistic, however. Consider, for example, a hierarchical organization in which management is reluctant to bottom-up initiatives. Further research should also aim to investigate institutional change under different decision-making systems.