How norms can generate conflict: An experiment on the failure of cooperative micro-motives on the macro-level

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Abstract

Norms play an important role in establishing social order. The current literature focuses on the emergence, maintenance and impact of norms with regard to coordination and cooperation. However, the issue of norm-related conflict deserves more attention. We develop a general theory of "normative conflict" by differentiating between two different kinds of conflict. The first results from distinct expectations regarding the specific way in which general normative obligation should be fulfilled, the second from distinct expectations regarding how strong the norm should restrain individual self-interest. We demonstrate the empirical relevance of normative conflict in an experiment that applies the "strategy method" to the ultimatum game. Our data reveal widespread normative conflict among different types

of actors, in particular among egoistic, equity, equality and "cherry picker" types. Our findings demonstrate how cooperative intentions for dividing a collective good may fail to produce cooperative outcomes on the macro-level. We explain this paradoxical aggregated macro-outcome of micro-motives with a game theoretical model and discuss its implications for modern societies, which become increasingly more heterogeneous and therewith prone to normative conflict.

JEL-Classification: Z130, C91, D30

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Many of our daily activities are governed by social norms, which set the rules of how we ought to behave. Often, we are not even aware of how societal rules influence the way we speak, greet, dress, eat, or express gratitude or love. By simplifying the complexity of social life, norms serve as a "lubricant" of social order and facilitate social interaction. It is quite remarkable, moreover, that social norms can enhance the welfare of a group by proscribing individual contributions to collective goods such as a clean environment, a safe neighborhood, public infrastructure facilities, trust in business relationships, reciprocal social relations or conflict resolution in general.

Despite the profound differences in the main theoretical approaches in the social sciences, such as the functionalist and the rational-choice perspectives, scholars seem to converge around the idea that social norms emerge because they are useful and have positive consequences for society. In the functionalist approach (Durkheim, 1897/1997; Parsons, 1937; Dahrendorf, 1958), the emphasis on social norms cumulated in the *homo sociologicus*, who is a pure marionette of normative and role expectations establishing social order. In contrast, scholars in the tradition of rational-choice theory have been explaining cooperative behavior by assuming a *homo oeconomicus* who is a purely forward-looking, egoistic maximizer. One of the central ideas in the rational-choice literature on norms is that the demand for cooperation norms in dilemma situations (Coleman, 1990) can be met if egoistic actors interact repeatedly (Taylor, 1976; Ullmann-Margalit, 1977; Bicchieri, 1990; Ellickson, 1991; Voss, 2001).[1] Interestingly, the emphasis of the arguments in both traditions, functionalism and rational-choice, is on the positive

[1]In addition, other mechanisms of the emergence of cooperation norms for egoistic actors have been proposed, such as reputation (Raub and Weesie, 1990), signaling (Spence, 1974; Molm et al., 2000) and altruistic punishment (Ostrom et al., 1992; Fehr and Gintis, 2007).

societal effects of social norms: "The view that norms are created to prevent negative externalities, or to promote positive ones, is virtually canonical in the rational choice literature." (Hechter and Opp, 2001, p. xvi)

In our view, social norms do not only promote cooperation and social welfare; they can also undermine it. With this article, we pursue to establish a new perspective on social norms, considering their capability to promote coordination and cooperation as just one of its facets and their potential to create conflict and transaction failure as its dark side. The novelty of our contribution is threefold: Firstly, we theoretically investigate the interaction of actors adhering to different norms. Secondly, we formally model these interactions by means of behavioral game theory. Thirdly, we support our claim by experimental evidence. To the best of our knowledge, our study is the first systematic and quantitative approach that deals with the interaction of different norms. The particularly interesting aspect of our reasoning for sociology is the counter-intuitive implication on the macro-level resulting from individual interactions on the micro-level. Specifically, we demonstrate how the interaction of actors with cooperative intentions can fail to produce cooperative outcomes on the macro-level.

Our theory of normative conflict builds up on the idea of heterogenous populations. While previous experimental studies focused on heterogeneity mainly with regard to norm followers and egoists (Fischbacher and Gächter, 2010; Fehr and Gintis, 2007), our approach considers a plurality of norms prescribing cooperation. Thus, we assume that members of the same population can hold profoundly different normative expectations, which we refer to as *normative conflict*. These different expectations specify how certain general behavioral expectations ought to be applied in concrete norm-relevant situations. This problem of normative conflict is especially prevalent in heterogenous populations. Here, norms may establish cooperation if actors coordinate on one single norm, but they can cause conflict if different normative solutions are taken. In this view, actors can have the best intentions and do their best, but nevertheless, their behavior is perceived as improper.

We develop this argument in several steps as follows. We will introduce a general theory of social norms and demonstrate how alternative theories of social preferences can be used to model normative conflict. We proceed with distinguishing different cases of normative conflict and derive hypotheses regarding the rates of normative conflict under these scenarios. We exemplify our theory for the case of bargaining norms in an ultimatum game and report the results from our experimental data studying the empirical magnitude and significance of normative conflicts.

1 A perspective of normative conflict

So far, we referred to social norms as a behavioral expectation regarding what ought to be or ought not to be done. For the establishment of our theory of normative conflict, we have to be more precise. First, let us refer to *norm-relevant situations* as situations in which social norms exist. In such situations, almost every member of a population believes that almost every other member has a certain behavioral expectation. These expectations are directed towards the so-called *target actors* of a norm, or shorter, *norm targets*. Moreover, norms are to the benefit of a certain group of actors, called *beneficiaries* of a norm.[2] We define a *social norm* as a commonly known behavioral expectation among beneficiaries and target actors regarding how the target actors ought to behave, which is enforced by sanctions in case of violations.[3] Note that a person can be at the same time a norm target and a beneficiary, but these can also be different people.

To specify the concept of normative conflict, we can subdivide two elements that constitute the structure of social norms. These two elements specify the factors that generate the behavioral expectations. We term the first element the *normative content*. The *normative content* may be defined as the kind of behavior that is prescribed or proscribed in a norm-relevant situation. It can be understood as the method that ought to be considered by the norm targets to serve the beneficiaries' interests. The second element of norms considers that social norms imply obligations. The normative expectations commits the target actor to restrict her self-interest in favor of the beneficiaries' well-being. Consequently, we may define this *level of normative commitment* as the extent to which the target actor ought to sacrifice her own interests. The level of normative commitment is not fixed. While some norms may require strong restrictions, others are less demanding.

The level of commitment and the normative content are triggered by normative cues. These cues serve as a context-specific signal telling us which of the many normative variants should be applied in which intensity. However, these signals can be fuzzy and the number of cues to be considered is sometimes ambiguous. Hence, they constitute an important parameter for achieving cooperation.

Paradoxically, actors can adhere to social norms, believe to behave correctly and, nevertheless, have conflicts with each other. Consequently, we can define *normative conflict* as the situation in which the norm targets and the beneficiaries hold different normative expectations of how the targets ought to behave in a given

[2]Note that the terms "target actor" and "beneficiary" stem from Coleman (1990, 247).

[3]For a discussion of different definitions of social norms see Opp (2001) and Elster (1989a), for a current review on social norms see Rauhut and Krumpal (2008), for literature on the punishment aspect see Yamagishi (1986); Heckathorn (1989), and for a microscopic foundation of coordination norms see Helbing (1992) and also Young (1993).

norm-relevant situation. We will demonstrate with some examples how normative conflict emerges due to the actors' adherence to different normative contents or different levels of normative commitment. The distinction between content and commitment of a norm enables us to classify two different types of normative conflict, which we illustrate in the following by social norms of distributive justice.

The first source for normative conflict can spark off if actors regard a different normative commitment as appropriate. This conflict can be found in many social dilemmas, i.e. the provision of public goods. It emerges in a social context where people share a norm, but some people try to free-ride on others to some extent. It is a quite robust finding that the gradual decline of cooperation is driven by the fact that there are at least some people who do not want to contribute their fair share, even if they accept the need to provide the good. Fischbacher and Gächter (2010) study this dynamics, showing that only minor under-cutting leads conditional cooperators to reduce their efforts as well. Thus, the shirking of a few can thus lead to a global emergence of conflict on the macro-level.

The second source of normative conflict is the adherence to different normative contents. For example, when it comes to performance-related salaries, blue-collar employees consider harmful working conditions as an important determinant, while white-collar employees stress value creation (Hyman and Brough, 1975) . In another study, soldiers differed in whether they considered military merits or the fact that someone is married and has children as being important for an early demobilization after world war II (Stouffer, 1949). These attributes of working conditions, family status or having children serve as cues, determining the allocation of scarce goods (such as money or demobilization).

Conflict can emerge if some people do not accept the applicability of certain cues, which are claimed to be valid by other groups. Think of a group in a firm calling for equal pay such that a share of $1/n$ should be allocated to every of the n employees. This means that there are no cues justifying an unequal pay. Now consider a second group claiming a payment scheme solely based on value creation. Obviously, there is no conflict if all employees create the same amount of value, but the expectations differ if there is variance in the relevant cue, as illustrated in figure 1 (c). Moreover, conflict due to content may even emerge, if people share a number of cues, but some of them are disregarded by others. Figure 1 (d) exemplifies a situation in which the allocation is either a function of one cue or of two cues (e.g. seniority or age).

We distinguish our theory of normative conflict from the theory of conventions (Lewis, 1969). While conventions are self-enforcing coordination rules, for example driving on the right side of the street, we regard social norms as the prescription to behave cooperatively in social dilemma situations (cf. Voss, 2001).

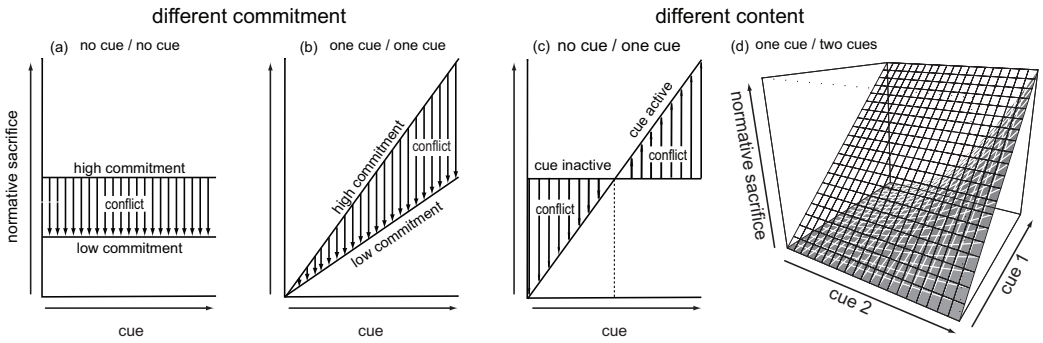


Figure 1. Illustration of normative conflict resulting from the adherence to different normative commitments (a and b) or different normative contents (c and d). In (a), the normative conflict sparks off between a person adhering strongly to an unconditional norm and someone adhering only weakly to that norm. The same applies in (b) for a norm conditional on one cue. In (c), the conflict is caused by the different requirements by an unconditional norm (such as equality) and a conditional norm (such as equity). The conflict in (d) is caused by the fact that one norm is conditional on one cue, while the other is conditional on two.

2 Bargaining norms as an exemplification of normative conflict

To further elaborate our concept of normative conflict, we will link it closer to the framework of distributive justice norms.[4] The general kind of questions we consider belong to the type of distribution of work in households (Sanchez, 1994; DeMaris and Longmore, 1996; Wilcox and Nock, 2005), the fairness of relative wage differences (Fehr and Gächter, 2000), or the criteria for the allocation of organ donations (Elster, 1992; Gross and Kriwy, 2008).

In these contexts, social norms can be thought of as a function mapping individuals' characteristics to expected outcomes. However, it is none of the clearest

[4]For our exemplification of the two sorts of normative conflict, we will focus on distributive justice only, though we are aware that this is only one of various forms of justice. For instance, the research on redistributive justice deals with the allocation of "bads", rather than goods, such as punishment in the case of crime. In most western countries, the rule of proportionality is important to determine an appropriate sentence for an defendant (Young, 1994). Procedural fairness research, on the other hand, investigates which procedures are considered fair. A major result is that people accept unequal distributions of goods or burdens, if the decision process was considered consistent, bias-suppressing, accurate, correctable, representative and ethical (Leventhal, 1976).

	what is to be equal	relevant characteristics of recipients need	fitness	effort	status	position	none	type
1.	equal amounts to each (objective equality)						X	unconditional
2.	equal opportunity	X	X				X	unconditional
3.	rank order equality				X	X		conditional
4.	subjective equality	X		X				conditional
5.	relative equality		X	X				conditional

Table 1. Different norms and their normative cues according to Eckhoff (1974). *Source:* Cook and Hegtvedt (1983)

(i) which characteristics of the individual serve as a normative cue, nor *(ii)* that there is consensus about the validity of the respective characteristics, nor that *(iii)* there is consensus about the implied degree of normative commitment. The largest emphasis in the literature has been put on identifying which individual characteristics are considered to be valid in a certain context. Systematic evidence on interactions among people with conflicting beliefs about the validity of these cues is, however, surprisingly weak.[5]

The little the literature on the interaction of different normative beliefs, the more extensive is the literature on the conditions under which (shared) norms are applied. In this section, we will review some of the important findings in distributive justice from the perspective of exchange theory. Exchange theory claims that people locally compare the outcomes they achieve with their fellow interaction partners' outcomes (Blau, 1964; Cook and Emerson, 1978; Molm et al.,

[5]There are some exceptions: Elster (1989b, p. 244 et passim) reports anecdotal evidence from collective bargaining. Once a norm is on the table, it is close to impossible for the negotiators to step back behind the expectations raised by these claims. Further anecdotal evidence can be found in international bargaining, e.g. the Turkey-EU accession talks (see Mikula and Wenzel, 2000). In these settings, interaction of conflicting norms lead to prolonged transaction failures.

2006). Given a specific norm, people experience unfairness if they receive less or more than what they should have in comparison to a relevant other.[6] Eckhoff (1974) identifies five fundamental rules commonly applied in exchanges (see table 1). These rules or norms can be roughly distinguished as to whether they do or do not take individual characteristics into account. The rules 1 and 2 can be regarded as unconditional with respect to individual characteristics, while the rules 3-5 take them into account (e.g. a person's needs, efforts, or status[7]). If they do take cues into account, one can also ask which individual characteristics shape the norms in a given situation.

2.1 Normative conflict over commitments

To test our general theory on normative conflict, we will now apply it to a more specific domain. Among the conditional norms in table 1, the rule of "relative equality" is the most relevant norm for our study. It has been extensively studied in equity theory. *Equity norms* assert that the individual input is the only valid criterion which determines the output. Those who invest more effort shall be compensated more generously (Homans, 1961; Blau, 1964; Adams, 1965; Cook and Emerson, 1978). By effort, we understand individual contributions in terms of time, endeavor, energy or other costly individual resources to achieve a goal. Adams' (1965) classical definition of equity refers to the equivalence of the quotient of outcome and effort ($O_i/E_i = O_j/E_j$) for all involved actors i, j. As Harris (1976) points out, this formulation of equity is rather simple, but it captures the relevant point.

In many situations, there may be a general agreement that allocations should be made on the ground of individual efforts, but there is disagreement about how much this cue should bind the decision maker. For example, the systematic undervaluation of work in "pink-collar"-jobs (i.e. nurses, secretaries) is considered as one important parameter in the explanation of the gender wage gap (Reskin,

[6] As opposed to exchange theory, status value theory (Berger et al., 1972), determines fair compensations from the more abstract perspective of "what is just for someone with my status", rather than by comparing interacting agents . It thereby considers structural aspects of a situation or society, which are somewhat disregarded in exchange theory. Status value theory aims at explaining why something is considered fair, while exchange theory, like our study, rather investigates people's reactions towards unfairness, however it may be defined. This has of course consequences for the concept of norms; While status value theory asks "what is normal", we ask how one should be treated as compared to an interaction partner.

[7] It has been noted that the status of the owner can affect the perceived value of a good. Golf clubs owned by John F. Kennedy sell for much higher prices at auctions than "ordinary" golf clubs do (Thye, 2000; Thye et al., 2005).

1988).

2.2 Normative conflict over contents (egalitarianism versus equity theory

Apart from the normative commitment, we have identified the different normative contents as a source of conflict. As opposed to the equity norms, *equality norms* often emerge when harmony in a group is paramount. As long as the involved persons are not too different with respect to need, status, or investments to a project, "objective equality" rules are the "method of choice".

It seems obvious that equity and equality norms can solve a cooperation problem; probably equally well. Both norms have the same implications if the effort levels are about equal: Outcomes should be split egalitarian. But if inputs are different, both norms imply different allocations. In this case, the intention to solve this problem is not enough. A population has to coordinate on one principle to avoid conflict. Moreover, the coordination on one normative principle, i.e. effort instead of status, may not even be a sufficient condition to ensure cooperation. Equity by itself leaves room for different interpretations, and the definition of valid cues may lead to completely different outcomes.

3 Derivation of hypotheses on normative conflict

3.1 A general model of normative behavior and its application to the ultimatum game

In this section, we will formally derive the existence of normative conflict from a simple and tractable model which has become prominent in the experimental literature on social norms. We will prove two propositions, namely that *(i)* normative agreement is always possible if subjects agree on the same normative cue, and *(ii)* that conflict may be unavoidable if there is disagreement about the underlying cue. To sketch the proof of proposition *(ii)*, think of somebody who made a major contribution to a common project and believes that she should be compensated accordingly. The less she is willing to accept an equal split, the stronger her commitment to the equity principle. The interaction can result in conflict if her interaction partner contributed only little but strongly claims an egalitarian allocation. We prove the existence of a threshold as a function of the individual contributions and the commitment to the norm. Conflict is likely to emerge if the

differences in contributions are beyond this threshold.[8]

There is little *analytical* research on normative conflict. However, we can apply general theories of normative behavior and analyze conditions under which alternative norms are in conflict with each other. Christina Bicchieri (2006) formulated such a general model, which is flexible enough to allow for an analysis of normative conflict. Unlike other models of normative behavior,[9] Bicchieri's model is flexible with respect to the normative content, thereby allowing the analysis of conflict between different normative contents.[10]

The workhorse of our theoretical as well as experimental investigation of normative conflict will be a variant of the *ultimatum game* experiment (Güth et al., 1982). The classical ultimatum game can be regarded as a parsimonious measure for distributive justice and fairness norms: One proposer and one responder bargain over a given amount of money, called the *cake*. The proposer offers a share of the cake to the responder. If the responder accepts the offer, she receives the share and the proposer can keep the rest of the cake. If the responder rejects the offer, the cake is lost and nobody receives anything.

Empirical results indicate that the ultimatum game meets the three criteria of social norms stated above. Responders have normative expectations about the proposer's behavior so that low offers are frequently rejected. This can be regarded as costly punishment of norm violations. Proposers anticipate such potential sanctions and form respective beliefs. These beliefs trigger behavioral regularities, such that offers below 20 percent of the cake are rare and close-to-equal splits are the most frequent outcome (Roth, 1995). This matches our definition of social norms given above, according to which there is 1) a commonly known behavioral expectation 2) among beneficiaries (the responder) and targets (the proposer) of this norm, 3) which is enforced by sanctions in case of norm violations (here: rejection of the offer).

To study normative conflict, one reference point is not enough. The conflict resulting from different norms can only emerge when there is room for at least two reasonable social norms. We therefore extend the ultimatum game by introducing an additional task, the production of the cake in the beginning. Literally speaking, proposer and responder have to bake the cake before distributing it. They may thus build claims depending on their respective efforts. For the formal analysis,

[8]The reader who is not interested in the details of the game theoretical reasoning could proceed directly with section 3.3.

[9]There are a number of models of normative (or fair) behavior, for examples, Fehr and Schmidt (1999); Bolton and Ockenfels (2000); Rabin (1993); Dufwenberg and Kirchsteiger (2004); Falk and Fischbacher (2006); Frohlich et al. (2004).

[10]The model is more complex in its general form and can account for a variety of games. We refer to chapter 1 of Bicchieri's book for a more general discussion.

we normalize the size of the cake to 1 without loss of generality.

For the simplicity of the argument, assume that a player's utility of a share of the cake $x \in [0, 1]$ can be evaluated by the material outcome x, the content N_i of her norm and the commitment $k_i \geq 0$ to her norm.[11] The general formulation of normative behavior allows to include different normative contents N_i for the proposer and the responder, facilitating the analysis of normative conflict. For the definition of N_i, we will utilize two well established distinct streams of research in behavioral economics and sociology. Probably the most cited formulation of an equality norm is the model proposed by Fehr and Schmidt (1999). The model implicitly attributes egalitarian norms to the subjects. Thus, it can be regarded as a representation of an equality norm which models a player's utility function who regards

$$N_{equality} = \frac{1}{n} \tag{1}$$

as the normative solution (which reduces to 1/2 in the case of $n = 2$ players).

However, rather than an equality norm, players may have internalized the equity norm. In this case, a player i takes the relative effort into account when evaluating the outcome x_i in the light of her normative expectation. Following the tradition of equity theory and the definition of Adams (1965), we consider the equivalence of the quotient $(x_i/e_i = x_j/e_j)$ of outcome x_i and effort e_i for all involved actors i, j as the the normative benchmark. The equity norm is thus given by the respective relative effort

$$N_{equity} = e_i = \frac{effort_i}{\sum_{j=1}^{n} effort_j}. \tag{2}$$

Furthermore, players can by committed to "their" norm to a different extend. The model assumes for the normative commitment $k_i \geq 0$. If k_i is equal to zero, norms do not play a role, while for players with a large k_i social norms have profound behavioral implications. We assume for the following analysis *common knowledge* of the players' efforts, their norms N_i and their normative commitments k_i.[12]

In case the responder rejects, both players' utility is given by

$$U_{p,reject} = U_{r,reject} = 0.$$

[11] The way we model utility has not been undisputed. For a discussion see Binmore and Shaked (2010); Fehr and Schmidt (2010); Eckel and Gintis (2010).

[12] The assumption of common knowledge does not qualitatively change the results; however, a more advanced version of a Bayesian game theoretical analysis would be clearly beyond the scope of the present article.

If the responder accepts an offer x_i,

$$U_{p,accept}(x, N_p, k_p) = 1 - x - k_p \max[N_p - (1 - x), 0] \tag{3a}$$

is the proposer's utility, and

$$U_{r,accept}(x, N_r, k_r) = x - k_r \max[N_r - x, 0] \tag{3b}$$

the responder's utility.

If a player i does not care about the fulfilment of her norm ($k_i = 0$), her utility is simply given by her share of the cake (i.e. x_i if i is the responder, $1 - x_i$ if she is the proposer). Then, the acceptance threshold is given by standard game theory with $t^* = 0$.

However, in the case of full commitment ($k_i \to \infty$), the utility is reduced and becomes negative for even smallest deviations from the "normative share". Players do not discount their utility, however, if they receive more than expected, which is implied by the maximum of Eq. (3) and Eq. (3).[13] Consequently, players only care about norm violations if they receive less than if their norm was followed. A responder accepts an offer x_i if her related utility is greater than zero, otherwise she rejects. Given the common knowledge of the norms and the normative commitment pursued by each player, a rational proposer would make an offer that maximizes her utility but keeps the utility of the responder non-negative.

If the responder is not committed to any norm so that $k_r = 0$, the utility of x is simply given by $f(x) = x$. Then, the acceptance threshold is given by standard game theory with $t^* = 0$. The proposer will anticipate this and will therefore offer zero. If k_r is positive, the responder's utility of x decreases if she receives less than what she expected.

If we plug the equality norm (1) and the equity norm (2) into the utility functions (Eqs. 3a and b), four cases can occur: Both players share the equity norm, they share the equality norm, the proposer holds the equity and the responder the equality norm, or the proposer holds the equality and the responder the equity norm. In case the proposer holds the equity norm, Eq. (3a) becomes

$$U_{p,accept}(x, N_p, k_p) = 1 - x - k_p \max[e_p - (1 - x), 0],$$

while for the responder who is holding an equity norm, Eq. (3b) becomes

[13] To keep the model tractable, we exclude the case that subjects feel guilt about being better off than their norm prescribes. However, the qualitative results of the analysis do not change when allowing for the consideration of guilt.

$$U_{r,accept}(x, N_r, k_r) = x - k_r \max[e_r - x, 0].$$

For the reversed case of an equality norm, the proposer's utility function becomes

$$U_{p,accept}(x, N_p, k_p) = 1 - x - k_p \max[1/2 - (1 - x), 0]$$

and the responders utility function is given by

$$U_{r,accept}(x, N_r, k_r) = x - k_r \max[1/2 - x, 0].$$

Solving the responder's utility function $U_{r,accept}(x, N_r, k_r) = 0$ with respect to x returns the responder's acceptance threshold

$$t^* = \frac{k_r N_r}{1 + k_r}. \tag{4}$$

If $x < t^*$, the utility of acceptance is smaller than the utility of rejection, so that the responder will reject even positive amounts.

3.2 Application of the model to study normative conflict

After defining the different types of utility functions, we can now theoretically investigate the macro-level results of interacting players. The first two cases prove that, given the restriction of complete information, normative conflict does not emerge if players share the same norm.

Proposition 1 *If proposers and responders share the same norm, that is if $N_p = N_r = 1/2$ or if $N_p = e_p$ and $N_r = e_r$ and if the normative adherence (as given by N_p, N_r, k_p, k_r) is common knowledge, there is no normative conflict, i.e. there exists an offer $x \geq t^*$ which will be offered by the proposer and accepted by the responder for all k_p and k_r.*

Proof: See Appendix B.

On the other hand, proposers and responders can adhere to different norms, which can cause normative conflict even under complete information. Intuitively speaking, an equity proposer with a high effort level cannot agree with offering the equal split to an equality responder, because she has contributed too little. Conversely, an equality proposer who contributed only a little cannot agree with

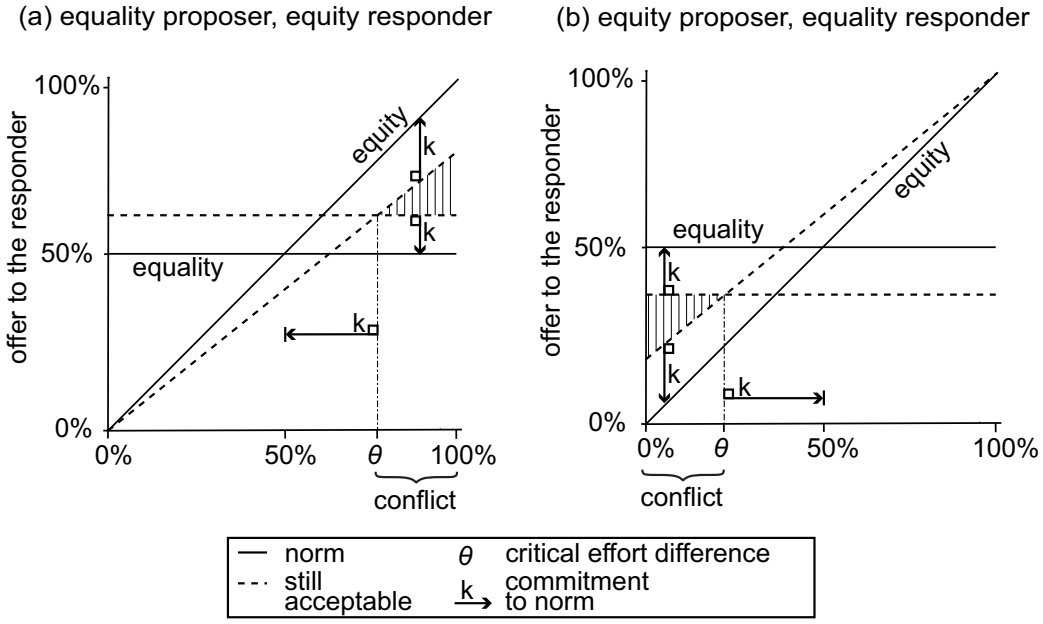


Figure 2. Illustration of normative conflict due to different normative contents. The θ denotes the threshold beyond which conflict is inevitable for holders of different norms and sufficiently high normative commitments. In (a), the normative conflict between an equality proposer and an equity responder occurs, if the responder contributed more effort than the critical threshold θ. In this case, a decreasing commitment to the equity norm reduces the responder's claims; however, not as much as the proposer would be willing to offer. In (b), the situation is reversed. The proposer holds an equity norm while the responder holds an equality norm. Conflict is inevitable, if the responder contributed less than the critical value θ, but has an acceptance threshold of almost 50 %.

offering only her effort level. Figure 2 tries to illustrate the argument in an intuitive way.

Normative conflict between holders of different norms occurs if the differences in their efforts are too extreme. What "too extreme" means depends on the normative commitment of the two players. We therefore have to evaluate the model in (3a) nd 3b) from the other side: As we already know the acceptance threshold for the responder, we are interested for which differences in efforts the utility of an accepted offer is still positive. Plugging the acceptance threshold of the responder into the utility function of the proposer and solving this equation with respect to the proposer's effort e_p yields the critical threshold θ of the relative differences $\frac{e_i - ej}{e_i + e_j}$.

Proposition 2 *If $N_p = e_p$, $N_r = 1/2$, and $e_p > \theta$, rejection is a subgame perfect equilibrium for certain values of k_p and k_r. If $N_p = 1/2$, $N_r = e_r$, and $e_r > \theta$, rejection is a subgame perfect equilibrium for certain values of k_p and k_r where the critical threshold of differences in effort is given by*

$$\theta = \begin{cases} \frac{k_p k_r + 2k_p + k_r + 2}{2k_p + 2k_p k_r} > \frac{1}{2} & \text{if} \quad N_r = e_r,\ N_p = \frac{1}{2}, \\ & \quad k_p > 1,\ \text{and}\ k_r > \frac{2}{(k_p - 1)}, \\ \frac{k_p k_r - k_p - 2}{2k_r + 2k_p k_r} < \frac{1}{2} & \text{if} \quad N_r = \frac{1}{2},\ N_p = e_p, \\ & \quad k_p > 1,\ \text{and}\ k_r > \frac{2}{(k_p - 1)}, \\ 1 & \text{otherwise.} \end{cases} \tag{5}$$

Proof: See Appendix B.

In summary, normative conflict as a result of different normative contents emerges if the effort differences are above a specific threshold. This threshold is given as a function of the different norms the subjects adhere to and the respective commitment to their norm. On the other hand, even people adhering to different norms can avoid conflict if they are sufficiently tolerant or not too different from each other with respect to their norm-relevant criteria such as effort.

3.3 Hypotheses

Proposition 1 and 2 demonstrate that normative conflict cannot occur if the proposer and the responder adhere to the same norm and have common knowledge

about their normative types. This holds for all cases of effort levels and normative commitments. If the proposer and the responder hold different norms, however, normative conflict is inevitable if their differences in efforts and their normative commitments are large enough.

This result follows from assuming common knowledge about the players' types. Relaxing this assumption would have to take into account the fact that neither the respective norms nor the respective commitment to the norms are commonly known. In this case, a proposer would have to maximize her expected utility over (priors of) distributions of norms and commitments. We performed preliminary theoretical analyses for this case, yielding results qualitatively similar to the results in the previous section: There is more normative conflict among holders of norms with different contents than different commitments. Further, the predicted rate of normative conflict is higher for the case of incomplete information. The conclusion from both theoretical analyses, the one with common knowledge and the one without, is that:

Hypothesis 1 *There is more normative conflict over contents than over commitments.*

We can derive a second hypothesis from our formal analysis of normative conflict. In the ultimatum game with efforts, normative conflict over contents means that players regard effort as either important or unimportant for their normative evaluation. Therefore, if two players do not differ in their effort levels, normative conflict does not spark off. In contrast, if the differences in their effort levels are large, the likelihood that they will come into conflict is high. This conjecture is illustrated in figure 2, from which we conclude that:

Hypothesis 2 *The larger the differences between the efforts of proposer and responder, the higher the probability of normative conflict.*

3.4 Conditions for measuring normative conflict

For the measurement of normative conflict in the case of ultimatum games with efforts, four assumptions have to be met so that a profound empirical analysis of normative conflict is feasible.

Condition 1 *The average offer and the average acceptance threshold are higher than zero.*

The measurement of normative conflict requires that the participants have to perceive the ultimatum game as a norm-relevant situation. Thus, almost everybody has to believe that almost every other participant has a "normative" expectation and not a selfish one. A selfish expectation would correspond to the game theoretical concept of subgame-perfect equilibria: The selfish responder should accept every positive offer, because a little amount is still better than facing the consequences of rejection and receiving nothing at all. The proposer should anticipate the responders' choice and offer the smallest positive amount, which is accepted by the responder. While the subgame-perfect equilibrium is rather straightforward, players with "normative" expectations will behave differently: Empirical results demonstrate that offers below 20 % of the cake are frequently rejected. This punishment of selfish behavior can be regarded as a consequence of the violation of a fairness norm. Proposers anticipate the potential punishment and may, in addition, comply with the fairness norm themselves so that low offers are rare and close-to-equal splits are the most frequent outcome (Roth, 1995; Cameron, 1999; Hoffman et al., 1996; Oosterbeek et al., 2004; Güth et al., 2007).

Condition 2 *The higher the responder's effort, the higher the responder's acceptance threshold and the higher the proposer's offer.*

In addition to the perception of the ultimatum game as norm relevant, the subjects have to differ in their adherence to different normative cues. The norm of equal splits is usually observed in ultimatum bargaining experiments, in which endowments are supposed to compensate the efforts of the participants, i.e. the time spent in the lab (for an overview see Güth, 1995). These efforts are usually the same for all participants, so that the straightforward allocation norm is to split the cake equally. Our method of generating different efforts to obtain the endowment introduces the effort as an additional normative cue. This triggers the behavioral expectation of an equity norm. Thus, at least for some subjects, effort should have a significant impact on the fairness decisions in the ultimatum game, which establishes a precondition of normative conflict.

Condition 3 *The population is heterogenous in either adhering to equity or equality norms.*

Effort should not only matter; the subjects should differ in their evaluation of effort as a norm-relevant criterion. In other words, the normative conflict over contents requires heterogeneity of the population in their adherence to different normative contents. In our context, some subjects have to adhere to the equity norm and others to the equality norm. This heterogeneity can be measured if some subjects evaluate effort as important for their offer and acceptance decisions

(the "equity players"), while others do not consider it as important (the "equality players").

Condition 4 *Both populations, the followers of equity and equality norms, are heterogenous in their commitment to their respective norm.*

Finally, the normative conflict over commitments requires that some actors believe that the norm should strongly restrict the pursuit of self-interest, while others only believe in mild restrictions. We suspect that different levels of normative commitment occur in situations, in which norm targets and beneficiaries have opposing interests. Such asymmetric situations are given if a beneficiary who is worse off claims that she ought to be compensated by a target actor who is better off. The ultimatum game is an ideal representation of such asymmetric situations. We can understand equity players with a low commitment as those who do not fully compensate the opponent's effort. Equality players with a low commitment can be understood as players who do not claim the full equal split but are fine with less than that.

4 Method

4.1 The ultimatum game

In order to test our theory, we conducted a variation of the ultimatum game experiment (Güth et al., 1982). In this game, one proposer and one responder bargain over a given amount of money (the *cake*). The proposer offers a share of the cake to the responder. If the responder accepts the offer, she receives the share and the proposer can keep the rest of the cake. If the responder rejects the offer, the cake is lost and nobody gets anything. This experiment is one of the most parsimonious methods for measuring normative behavior. A high offer is usually regarded as adherence to a fairness norm and the rejection as a punishment for violating the norm.

4.2 The real effort task

Our first variation of the ultimatum game introduced a real effort task by requiring the subjects to invest their own time *prior* to the experiment. Thus, every subject could decide on her own as to invest spare time in order to earn more money later on. Five days before the experiment, the subjects received a seven page long text

of a *Wikipedia* entry on the Westminster Palace by email.[14] An accompanying letter informed the subjects that their preparation of the text will influence their possible earnings in the experiment. We chose a rather specific topic to ensure that everybody actually had to learn the text and nobody could benefit from her respective field of studies (such as mathematics or paleontology). At the beginning of the laboratory experiment, the subjects had to answer twenty questions about Westminster Palace. There were five answer categories, one of which was correct. For each correct answer, subjects earned 1 Euro. Thus, the maximum earning was 20 Euro and purely random answers had an expected mean return of 4 Euro. In the ultimatum bargaining part, the joint earnings of two randomly drawn players were pooled to form the cake. This procedure was designed to induce a feeling of personal effort and inherent monetary earnings. In particular, the effort was real in the sense that subjects had to spend their own spare time for the preparation for the experiment. In contrast, previous experiments measured effort with the subjects' performance during a fixed time in the lab, which was equal for all subjects who accepted to participate in the experiment.[15]

4.3 The strategy vector method

Our second variation of the ultimatum game introduced an enhanced method for measuring normative behavior on the individual level, called the *strategy vector method* (Selten, 1967; Fischbacher et al., 2001; Falk and Fischbacher, 2002). A "conventional" ultimatum game with efforts would ask a proposer to offer her responder a certain amount of money. The responder could accept or reject this individual offer, while both players knew both particular effort levels. This method would only allow to test offers and their acceptance for two particular effort levels. In contrast, our implementation of the strategy vector method allows to measure the offer and the acceptance for every possible combination of effort levels. For illustration, consider the following example. From the pool of all subjects, two subjects i and j were matched by the computer.[16] Player i was informed that she earned 10 Euro in the quiz but was not yet informed about player j's effort level and her actual role. Instead, we asked her about all decisions for every possible

[14] Wikipedia contributors, "Westminster Palace," Wikipedia: The Free Encyclopedia, *http://de.wikipedia.org/wiki/PalaceofWestminster* (accessed May 04,2008 14:40)

[15] For instance, Gächter and Riedl (2005) and Rauhut (2009) implemented a general knowledge quiz without the opportunity to prepare for it beforehand and Frohlich et al. (2004) let subjects proofread a text to correct spelling errors.

[16] We matched two players from two separate rooms according to their results in the quiz. We implemented two setups: The rule "best against best" enhances the variance in the stake size and the rule "best against worst" the variance between subjects.

effort level in both roles: In the first step, she was asked in the role of the proposer of how much she offers if her responder j contributed 0 Euro, 1 Euro, 2 Euro, ..., 19 Euro, 20 Euro. In a second step, the roles switched and player i was asked for the minimal offer she is willing to accept if her proposer j contributed 0 Euro, 1 Euro, 2 Euro, ..., 19 Euro, 20 Euro, which we refer to as the "acceptance threshold". Player i and player j similarly entered 21 decisions as a proposer and 21 decisions as a responder. As a next step, the computer determined the joint cake size of player i and j. Suppose that player i contributed 10 and player j 15 Euros to the cake. Then, the computer compared whether the proposer's offer for the responder's effort of 15 was at least as high as the responder's acceptance threshold for a proposer's effort of 10. The money was paid, if the offer was as high or higher than the responder's acceptance threshold, otherwise the money was lost. Summing up, the strategy vector method has the advantage to return 21 decisions as a proposer and 21 decisions as a responder for each subject (rather than just 1 decision in the "conventional" ultimatum game).

4.4 Discussion of the strategy vector method

The strategy vector method is known to elicit decisions which may differ from decisions elicited under the classical *response method*, as applied in the standard ultimatum game described above. Entering all decisions at the same time may encourage a linear approach to the task. This may result in an overestimation of consistent equity or equality behavior, and may neglect that subjects actually have "psychological cutoffs", for example that less than 30 percent is not worth much and more than 80 percent is almost like getting everything.

Entering decisions for both roles could further trigger a sort of Rawlsian thinking, so that the subjects are put "too much" into the shoes of the other, provoking overly normative behavior. In particular, Rawlsian thinking may be especially important in the role of the proposer. This is why we let the subjects enter the proposer decisions prior to the responder decisions. In that sense, they have not been "in the other's shoes" yet, so that the "Rawlsian" bias will be negligible. Answering all the questions on one screen could also lead to a consistency bias if subjects make one decision based on a principle, rather than 21 decisions for every size of the cake. However, even if these biases existed, they would support the isolation of normative beliefs in a payoff-relevant environment.

A third issue of the strategy method is known as the distinction between "hot" vs. "cold" (Brandts and Charness, 2000). The cold, partially hypothetical, character of some of the decisions in the strategy vector ultimatum game could make the responder more rational, i.e. accept lower offers. In turn, low offers in the classical ultimatum game sometimes result in emotional rejections of offers that are judged

unfair. XXX and YYY (2009) find in a comparative study, that proposers' offers do not differ in fact, but responders are willing to accept lower offers when asked directly as compared to the elicitation by the strategy method.

4.5 Procedure and participants

The experiment was conducted using the *z-Tree* software developed by Fischbacher (2007). At the beginning of each session, the subjects were randomly assigned to one of the computer terminals. General instructions regarding the procedure were given on paper. The subjects were informed about the knowledge quiz and it was once again pointed out that their preparation of the text will have a strong influence on their performance in this quiz and respective monetary earnings. After completing the quiz, the subjects received the instructions for the ultimatum game experiment. Next, they had to respond to test questions regarding the rules of the game up to three times, allowing us to verify that the participants understood the rules. The experiment started when there were no further questions to the experimenter. Communication was prohibited from that point onwards. After completing the ultimatum game experiment, subjects were individually paid at their seats at the end of the session.

The subjects were 92 undergraduate students of the University of Leipzig, recruited from a wide range of academic disciplines. 47 subjects were male and 45 female. The experiment was conducted in two separate computerized laboratories. The subjects were matched such that the proposers and responders were located in separate rooms. Three of our experimental sessions consisted of twenty subjects, one of eighteen and one of fourteen subjects.[17]

5 Results

5.1 Confirmation of the conditions of normative conflict with macro-level analyses

We begin our empirical investigation with an analysis of the four conditions of normative conflict outlined in section 3.4. We start with a high level of aggregation (sec. 5.1) and continue with a more detailed investigation on the individual level (sec. 5.2). Thereafter, we test our two main hypotheses on normative conflict in section 5.3.

Our statistical estimation results are based on multilevel models. These models quantify the impact of effort on the proposer's offer and on the responder's

[17] In sessions 1 and 4, fewer subjects than expected showed up.

acceptance threshold and, more importantly, the variance in the subjects' level of normative commitment in their consideration of effort. The multilevel modeling takes into account that the 21 decisions per subject are not independent of each other. The multilevel models applied in our analysis estimate the average effect of effort on the individual level (fixed effect). Further, they estimate the standard deviation of the effect of effort across individuals in the population (random effects). Moreover, the multilevel models estimate the average intercept and the standard deviation of this intercept across individuals in the population.[18]

Result 1 *On average, proposers offer considerable amounts of money and low offers are frequently rejected.*

The participants do understand the game as a norm-relevant situation so that Condition 1 is met. There is significant empirical evidence that most players are guided by social norms rather than by playing the subgame perfect Nash equilibrium of offering and accepting the smallest possible amount: The intercept of the proposer shows that even for the case that the responder contributes nothing, proposers offer 33 % of the cake on average. Furthermore, the responders' positive intercept of 31 % in the fixed-effects part of the model reveals that the responders are punishing norm violations at own costs, supporting that responders perceive the ultimatum game as norm-relevant.

Result 2 *The higher the responders' effort the higher their least accepted offer and the higher the proposers' offer.*

Result 2 supports Condition 2 that at least some subjects regard the criterion of effort as norm relevant. In addition to the proposers' and responders' intercepts, the relative contribution to the common pool significantly affects both, the offer and the acceptance threshold: If a responder contributed the full cake, she receives a 29 % higher offer and has a 15 % higher acceptance threshold than if the proposer contributed the full cake. The empirical relevance of effort, therefore, provides the precondition for heterogeneity in normative expectations.

[18]To put it more technically, consider the offers and acceptance thresholds as a function of the responder's relative effort

$$y_{ij} = (\beta_1 + \zeta_{1j}) + (\beta_2 + \zeta_{2j})x_{2j} + \epsilon_{ij},$$

where β_1 is the population intercept, ζ_{1j} and ζ_{2j} are idiosyncratic error terms following the distribution $\zeta_{ij} \sim N(0, \psi)$, x_{ij} is the relative effort of the responder and ϵ_{ij} is an independent measurement error. The fixed effects part estimates β_1 and β_2, the random effects part estimates ψ for $\zeta_1 j$ and $\zeta_2 j$. For introductions to multilevel analysis see Snijders and Bosker (1999) and Rabe-Hesketh and Skrondal (2005).

Table 2. Linear multilevel models for the impact of the responder's efforts on the proposer's offers and on responder's relative acceptance thresholds.

	Proposer's relative offer	Responder's relative threshold
Fixed effects N=1931 decisions		
Intercept	0.33***	0.31***
	(0.021)	(0.025)
Responder's relative effort	0.29***	0.15***
	(0.041)	(0.037)
Random effects J= 92 subjects		
Standard deviation intercepts	0.20***	0.24***
	(0.015)	(0.018)
Standard deviation responder's efforts	0.39***	0.35***
	(0.030)	(0.027)
Correlation (responder's efforts/intercepts)	-0.84***	-0.60***
	(-0.090)	(-0.065)
Log-Likelihood	2478.7	2950.4
Observations	1931	1931

Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Note: Effort, offers and acceptance thresholds are normalized. This normalization expresses the efforts of the responders relative to the efforts of the proposers (scaling from 0-1). Further, the offers and acceptance thresholds are expressed in relation to the cake sizes (scaling from 0-1).

The random effects suggest that our subjects are heterogenous in their level of normative commitments and contents. This argument is supported by two results.

Result 3 *The population is heterogenous in the subjects' effects of effort on offers and acceptance thresholds.*

Result 3 is supported by the large and significant standard deviation of the responder's effort in the random effects part of Table 2. Result 3 therefore provides evidence for Condition 3.

Result 4 *The population is heterogenous in the subjects' average offers and acceptance thresholds.*

Result 4 is supported by the large and significant standard deviation of the intercept in the random effects part of table 2. Thus, Result 4 confirms Condition 4. Based on Results 3 and 4, we infer the existence of three distinct types of normative behavior in our population: *Equality players* with high intercepts and low slopes, *equity players* with the inversed pattern of low intercepts and high slopes and *egoistic players* with low intercepts and low slopes. While the first two types would be explained by normative behavior, the egoistic players do not adhere to a norm, but rather to the game theoretical standard solution of the game. Moreover, the strong negative correlations between intercepts and slopes suggest that equality and equity players are more frequent than egoistic players.

In the following, we investigate the distinct types of normative behavior in more detail by graphically exploring all data points for the bivariate relation between effort and offer, and between effort and acceptance threshold. Figure 3 illustrates the proposers' offers (top) and responders' acceptance thresholds (bottom) for given responders' efforts. In the top figure, it can be seen that most offers cluster around the two lines corresponding to the equity and the equality norm. We can regard the pure equity and equality norm as attractors or "focal points" in Schelling's sense. But not all proposers adhere to pure equity or equality norms. There are also a few "hyper-fair" offers (in the upper left corner). Further, a large fraction of offers is located between the equity line and the equality line (lower left and upper right corner), or even below both lines (lower right corner). Thus, some proposers are biased by self-interest. Although some proposers increase their prospective share by making moderately low offers, only few of them play the subgame-perfect equilibrium solution and offer the minimum amount.

Among the responders, there are surprisingly many players who adhere to the equality norm and are willing to punish offers below 50 % with rejection. This is an unusual finding, as many previous studies report that offers of 40 % and above are almost always accepted. In contrast to the results for the proposers,

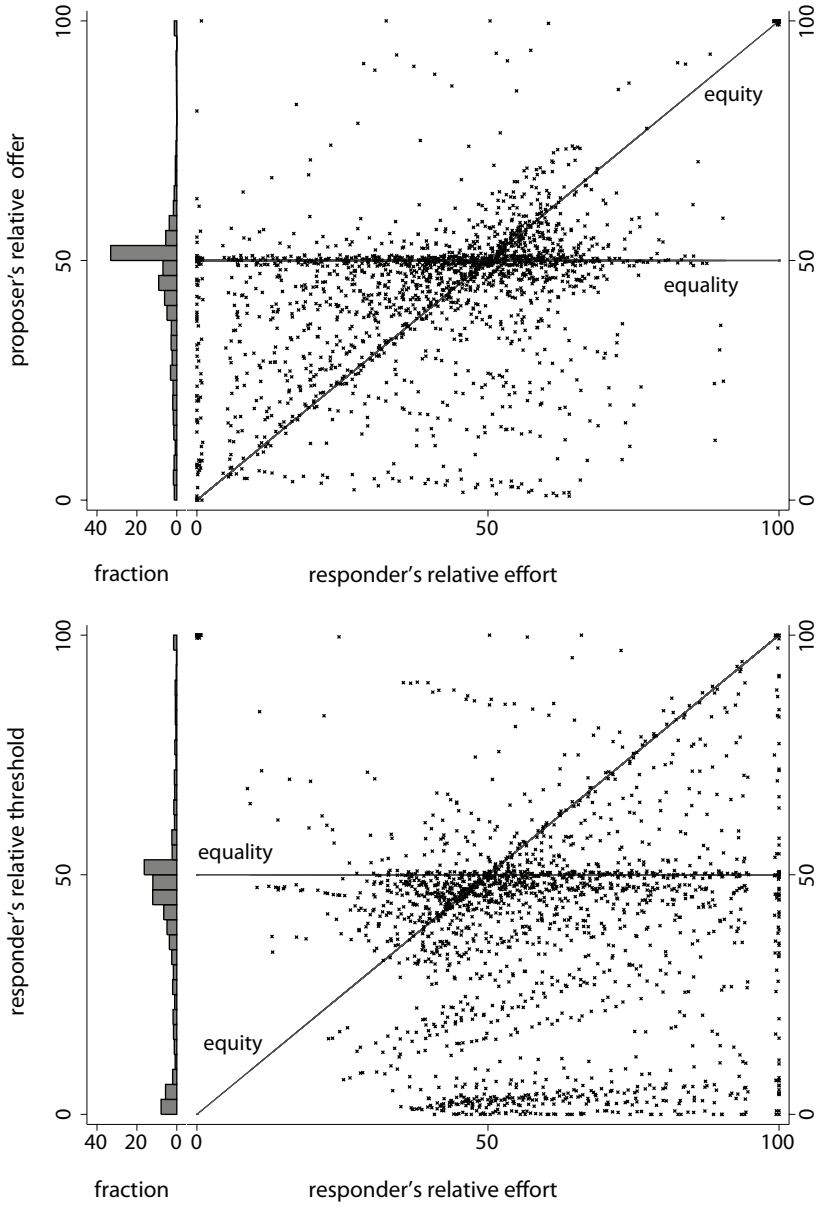


Figure 3. Proposer's relative offers as a function of the responder's relative effort (top) and responder's relative acceptance thresholds as a function of the responder's relative effort (bottom). The responder's contribution on the abscissa is maintained for proposer's offer and responder's threshold, resulting in a reflected distribution of points. The histograms on the left show the distribution of the relative size of offers (top) and acceptance thresholds (bottom). The axis labels depict percentages. The distinct normative types are illustrated by additional lines for equality and equity norms. Most offers cluster around these lines, while there is considerable noise, too. Responders cluster less around the equity and equality lines. Responders show more risk-averse behavior than proposers, indicated by a third cluster of considerably low acceptance thresholds.

the "attraction" to the pure equity and equality norms is not as pronounced for the responders. As a result, the variance in the responders' decisions is much higher. Further, the histogram on the left shows that 20 % of the acceptance thresholds are below 20 %. The respective players are willing to accept very low offers, sometimes even if they contributed much more than their proposers. This pattern can be found in the cluster at the very bottom of figure 3.

5.2 Investigation of the underlying micro-level roots of normative conflict

How can we understand the structures on the macro-level by micro-level behavior? We continue our evaluation of the necessary conditions of normative conflict by examining the individual decisions and find surprisingly clear patterns. Figure 4 depicts four typical proposer profiles and figure 5 four typical responder profiles. Player 2 (upper left) represents a pure equality player: In the role of the proposer (figure 4) and in the role of the responder (figure 5), player 2 offers and claims always 50 % of the pool, regardless of the differences in effort between proposer and responder. In the upper right part of figure 4 and 5, player 3 shows pure equity behavior. Player 3 offers always exactly as much as the responder's effort and always demands at least her effort as a responder. As a third type, we find players who play the subgame perfect Nash equilibrium. Player 13 (lower left) constantly offers and accepts the smallest possible positive amount of 0.50 Euro. Consequently, we call this player type the *egoist*. We found even another type, showing an interesting hybrid behavior between self-interest and norm-compliance. This fourth type plays according to the equity norm as long as she is a relatively high achiever, and switches to the equality norm if she is a relatively low achiever. See player 20 as a proposer and player 36 as a responder of this type on the lower right of figure 4 and 5. We call this players *cherry pickers*, as they seem to adhere to norms, but "pick" the particular norm, which serves their self-interest best.

In order to classify the subjects to normative types, the players have been categorized according to their reaction to the responder's effort. We classified the player's proposer and responder behavior separately, looking at the offers [and acceptance thresholds] in the role of the proposers [and responders]. Our developed classification algorithm is based on OLS regressions, taking effort as predictor for the individual offers and acceptance thresholds. We made sure that the algorithm is not biased by our theory by imposing the normative types on the empirical data but rather assigns subjects to types in a purely data-driven way. More specifically, our approach classifies the individual strategies according to the respective intercepts and slopes of the individuals' regressions. We categorized players with a low slope and a high intercept as equality, with a low slope and a low intercept as egoist,

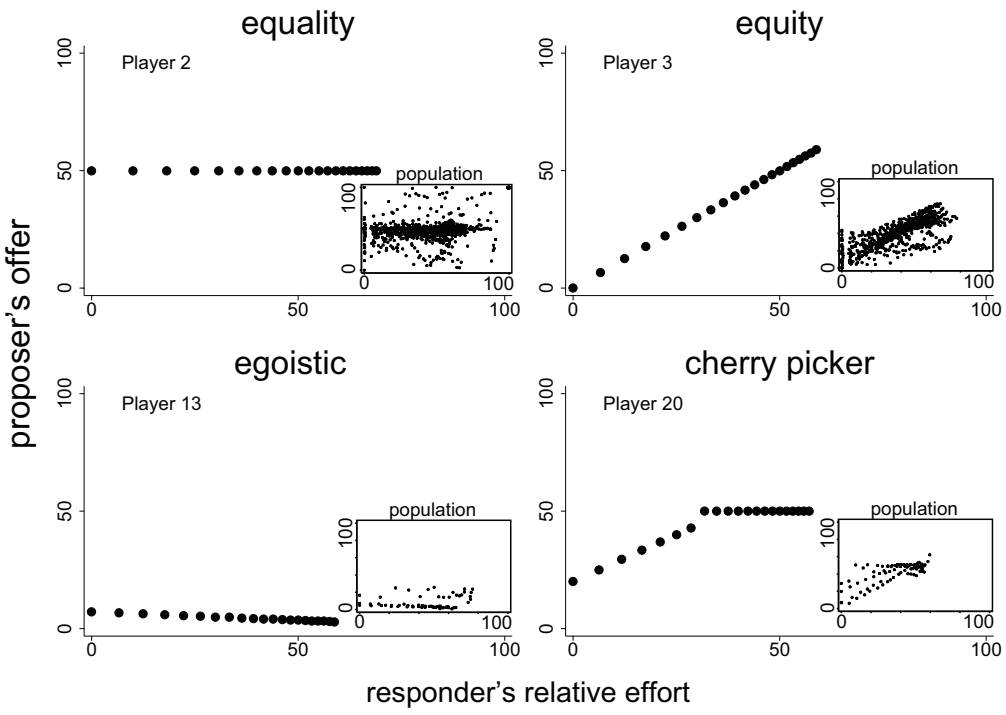


Figure 4. Offers of selected players. The larger figures depict individually observed strategies. We find 54% (n=50) equality proposers (upper left), 39% (n=36) equity proposers (upper right), 3% (n=3) egoistic proposers (lower left) and 3% (n=3) cherry picker proposers (lower right). The insets depict the superposition of all individual decisions in the population classified as belonging to the corresponding type.

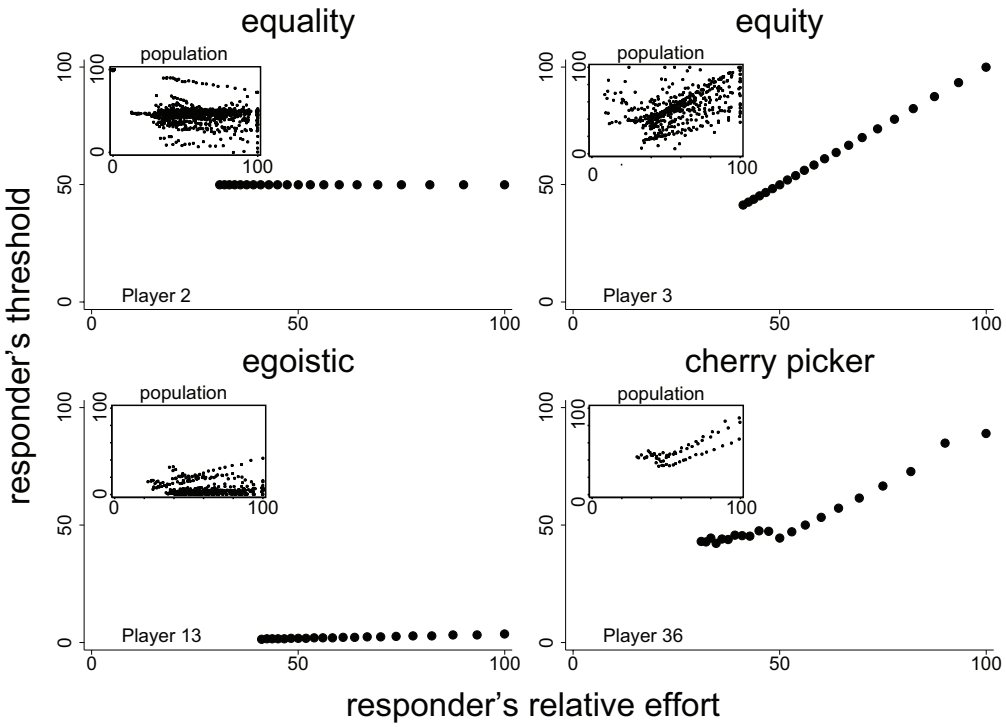


Figure 5. Acceptance thresholds of selected players. We find 52 % (n=48) equality responders (upper left), 25% (n=23) equity responders (upper right), 20% (n=18) egoistic responders (lower left) and 3% (n=3) cherry pickers (lower right). The insets depict the superposition of all individual decisions in the population classified as belonging to the corresponding type.

with a high slope as equity and with a quadratic slope as cherry picker. We refer to appendix A for an extensive discussion of our classification algorithm.

The insets in the figures 4 and 5 describe the resulting distribution of different proposer and responder types. More than half of the proposers adhere to equality norms and about 40 % to equity norms, while cherry pickers and egoistic proposers are the exception (3% each). Participants are more risk-averse if they are in the role of the responder: While 48 % adhere to the equality norm, the fraction of equity players is only 25 % and the fraction of egoistic responders reaches 20 %. The proportion of cherry pickers is again small (3 %) as a result of the strict definition.

5.3 Testing the theory of normative conflict

In the following, we confront our theory of normative conflict and the respective derivation of our two hypotheses with our empirical data. From now on, we focus only on those subjects who are either equity or equality types as proposer or responder, because these types are the most prevalent cases in our data.[19] This means that any given proposer/responder can be described by her norm (equity or equality), and her respective commitment to that norm. A player adhering only mildly to equity is nevertheless classified as equity, not as a combination of equity and equality. In the following statistical analysis, we take all possible interactions into account and not only those pairs, which have actually been matched in the experiment. Note that this procedure does not bias our results because every subject had to respond as a proposer and as a responder *before* they were actually assigned to a role and matched with their opponent, i.e. no learning effects could occur.[20] Thus, we can base our estimation on 4830 interactions because each of the $n = 70$ subjects can be matched as a proposer with each of the other subjects as a responder, resulting in $\frac{n(n-1)}{2} = 2415$ interactions. Conversely, each subject can be matched as a responder with each of the other subjects as a proposer, resulting in additional $\frac{n(n-1)}{2} = 2415$ interactions. As this procedure implies that each subject met several decisions that are not independent, we correct for inflated standard errors by clustering for subjects. Comparable analyses taking only the actually realized matches in the experiment into account yielded similar results but with larger standard errors.

Result 5 *There is more normative conflict over normative contents than over normative commitments.*

To support our Result 5, we simulated the interactions of every proposer with every responder, using our empirical data. Figure 6 describes the relative frequencies of the different forms of normative conflict. In confirmation of Hypothesis 1, our concept of conflict over contents is the more prevalent source of conflict compared to the case of conflict due to different commitments. From 2263 interactions among holders of different normative contents, 39 % (885 cases) end in rejection, while in only 32 % (822 out of 2567) of the interactions, conflict emerges among

[19] The other types are too rare for the analysis of conflict: We identify 3 proposers and 3 responders as cherry-picker types and 3 proposers and 18 responders as egoistic types.

[20] We excluded one subject as an influential outlier, because this subject contributed zero to the pool and showed very extreme behavior by offering everything as a proposer and demanding everything as a responder. The previously reported results yield no differences if this case is excluded.

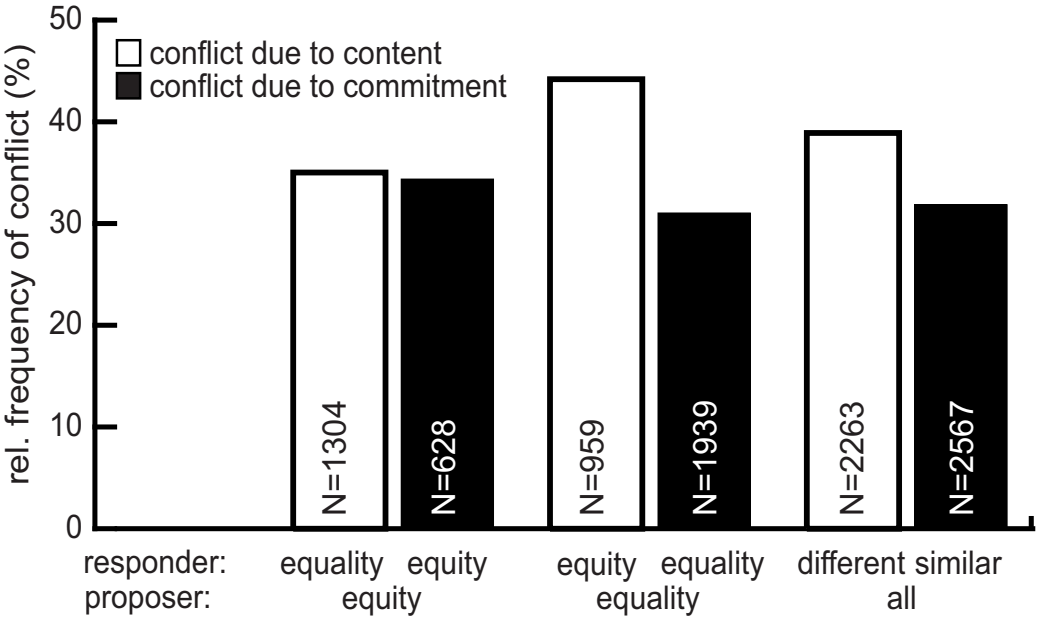


Figure 6. Frequency of conflict for the situation that the proposer and the responder adhere to different normative contents or different normative commitments. N denotes the absolute frequency of the respective interactions. The y-axis denotes the relative frequency of the occurrence of conflict, measured by the rejection of the offer.

holders of different levels of normative commitments. The percentage of content-related conflict is even higher if only equality proposers are considered (44 % or 426 out of 959 interactions), while the relative frequency of this type of conflict with an equality responder does not differ (31 % or 605 out of 1939). The picture is slightly different for equity proposers. Here, it does not make a difference whether the responder shares the norm or not. Conflict arises in 217 out of 628 interactions (35 %) when the responder shares the proposer's norm, just like in the case when the responder adheres to the equality principle (36 % or 459 out of 1304 observations). A logit model confirms the results from figure (6), estimating significantly higher probabilities of conflict if actors do not share the same normative content (robust standard errors, $z = 5.14$, $p < 0.001$).[21] Overall, the data supports our claim that conflict due to different normative contents is quite an important notion to understand the interrelation between social norms, cooperation and conflict.

[21] We checked the robustness of the result by applying a clustered logit model as well as a robust and a clustered probit model. They all return qualitatively similar and statistically significant results.

Finally, we confirm effort as the underlying source of normative conflict as it is stated in Hypothesis 2. The differences between the proposer's and responder's effort spark off the conflict over the alternative norms, as it is illustrated in Figure 1. To put it differently, the normative conflict among an equality and an equity player increases with increasing differences in their levels of effort.

Result 6 *The larger the differences between the proposer's and responder's efforts, the higher the probability of normative conflict, indicated by higher rejection rates.*

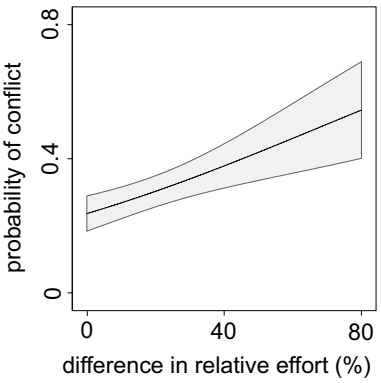
Result 6 is supported by figure **??** and the corresponding logistic regression model. Note that the data refers to all potential interactions between all players in each role. The regression calculates the probability of conflict as a function of the difference in relative effort between proposer and responder. Our findings confirm Hypothesis 2 that normative conflict is significantly more likely for unequal effort levels. The probability plot on the left of Figure **??** reveals that about 25 % of the subjects end up in conflict if their efforts are similar, while 55 %, if their efforts are dissimilar, when one party contributed almost everything and the other almost nothing.

6 Discussion

This paper outlines a new theoretical perspective on social norms, which considers conflict as an inherent element of norms. The heterogeneity of norms is a potential source of conflict, contrary to the widely discussed capability of norms to promote cooperation. Our empirical confirmation is based on a strategy ultimatum game, in which actors apply different norms of distributive justice if they differ in their effort for a common project.

A substantial fraction of our participants holds an equality norm and demands an equal share of the cake irrespective of their effort. Another substantial, but slightly smaller fraction holds an equity norm and demands the share that corresponds to their effort. We show the empirical relevance of normative conflict, when both players decide to be cooperative and contribute a "fair" share to the common good but hold different norms regarding what they consider as fair. We explain this kind of disagreement by the adherence to different normative contents.

Furthermore, our evidence demonstrates another source of normative conflict. Our empirical data reveal that the adherence to similar norms is by no means sufficient to achieve cooperation. In fact, people have to agree on the extent to which social norms should restrain their self-interests, i.e. people have to commit themselves to a norm to a similar extent. Even though they might agree that,



	conflict
intercept	-1.172***
	(0.148)
difference in relative effort	0.017***
	(0.005)
interactions	8190
clusters within subjects	92
Log-Likelihood	-4897.05

Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Figure 7. Logistic regression quantifying the impact of differential effort on conflict. The larger the differences in relative effort contributed to the common pool, the higher the probability of conflict. The table on the left reports logit estimates and standard errors, the figure on the right displays the corresponding changes in the probability of conflict. The grey area represents the 95 % confidence bounds for the logit coefficient "difference in relative effort". Relative effort ϵ_i is measured in percentages with the own contribution divided by the total contribution of the respective interaction between proposer i and responder j. We take absolute values of the differences in effort, i.e. $|\epsilon_i - \epsilon_j|$, and therefore do not differentiate whether the proposer or the responder contributed more. The number of interactions is calculated by all possible interactions between each subject in the role of the proposer and all other subjects in the role of the responder. Clustering of subjects in these interactions is taken into account by calculating robust standard errors.

in principle, one should follow a specific norm, "undercutting" may be regarded as legitimate by some, while it is unacceptable for others. Thus, different degrees of normative commitment form a second important source of normative conflict. Our experimental results show that conflict due to different normative contents is more prevalent than conflict resulting from different normative commitments.

The "cultural diversity" of social norms is therefore remarkably ambivalent. On the one hand, the plurality of social norms can be enriching, refreshing and may help the society to adjust to different situations and changing conditions. The recognition of alternatives to habits and behavioral standards that we take for granted opens our eyes for the arbitrariness of certain norms and for our often non-reflective tendency to follow traditional rules. This heterogeneity of normative behavior can stimulate creativity and innovation in society, stimulating the increase of individual and public welfare. On the other hand, cultural diversity can endanger cooperation and social order even when all members of society adhere to normative expectations. The coexistence of distinct norms can generate conflict despite cooperative intentions. Besides, power plays a crucial role in the determination of which behavioral expectations will last and prevail. There is a constant struggle in society to obtain the power to define those norms as valid that are most favorable for the own interests. This struggle is often accompanied with hypocritical rhetorics to convince the disadvantaged to adhere to norms that promote seemingly great benefits. Due to the complexity of these social conflicts and cleavages, future research will have to address the relations between power, the internalization of norms and selfish behavior. or instance, do actors with higher incomes tend to pursue equity norms and do actors with more power promote norms that predominantly apply to those with less power to benefit the powerful? We need both, laboratory studies to test the theoretical relations on the micro-level, and surveys to evaluate the social structure of normative conflict. In conclusion, we believe that our new perspecitve on normative conflict is fruitful to uncover the double-edge of social norms in promoting cooperation on one side, but conflict on the other.

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Author's contributions:

F.W. introduced the idea to study normative conflict and conducted the experiment. F.W. and H.R. elaborated the concept of normative conflict, analyzed the data, performed the game theoretical analysis of normative conflict and wrote the manuscript. D.H. supervised the study, organized the scientific collaboration, edited the manuscript, and contributed own ideas. All three authors developed the experimental design together.

Appendix

A Classification algorithm for fairness types

We have developed a sorting algorithm to assign each subject to a distinct strategy type of equity, equality, egoist or cherry picker. At first, we estimated two ordinary OLS regressions for each subject separately. The first univariate regression estimated the effect of each additional unit of relative effort on the proposer's offer (`slope`). Naturally, this regression as well returned a value for the intercept which corresponds to the proposer's offer for the case that the responder contributed nothing (`intercept`). A second, bivariate regression estimated the quadratic slope between effort and offer, adding the responders squared effort as an independent variable ($\texttt{effort}^2$). A negative slope for $\texttt{effort}^2$ characterizes cherry picker proposers, a positive slope of $\texttt{effort}^2$ cherry picker responders. Thus, all players can be categorized by the values of their `slope`, `intercept` and $\texttt{effort}^2$.

In the next step, we define critical values to assign the subjects to distinct types. We estimated Epanechnikov kernel densities for the distribution of `slope`, `intercept` and $\texttt{effort}^2$ among all subjects. As can be seen in figure 8, the distribution of `slope` and `intercept` is bimodal for responders and proposers. We define the critical values as the minimum between the two local maxima. The critical values for the proposers are `slope` = 0.29 and `intercept` = 0.21. The critical values for the responders are `slope` = 0.26 and `intercept` = 0.26. For most of the subjects, the additional quadratic term does not contribute explanatory power. This means that most subjects do not abandon their normative expectations, if stakes are raised. A straightforward method to choose the relevant critical value is to separate at one standard deviation above zero, $\texttt{effort}^2$ = (0.77), for the responder and one standard deviation below zero, $\texttt{effort}^2$ = (-0.65), for the proposer. By this, we assign only those subjects to the cherry picker type, who obviously play this strategy.

Consequently, subjects with the `slope` below the critical value and the `intercept`

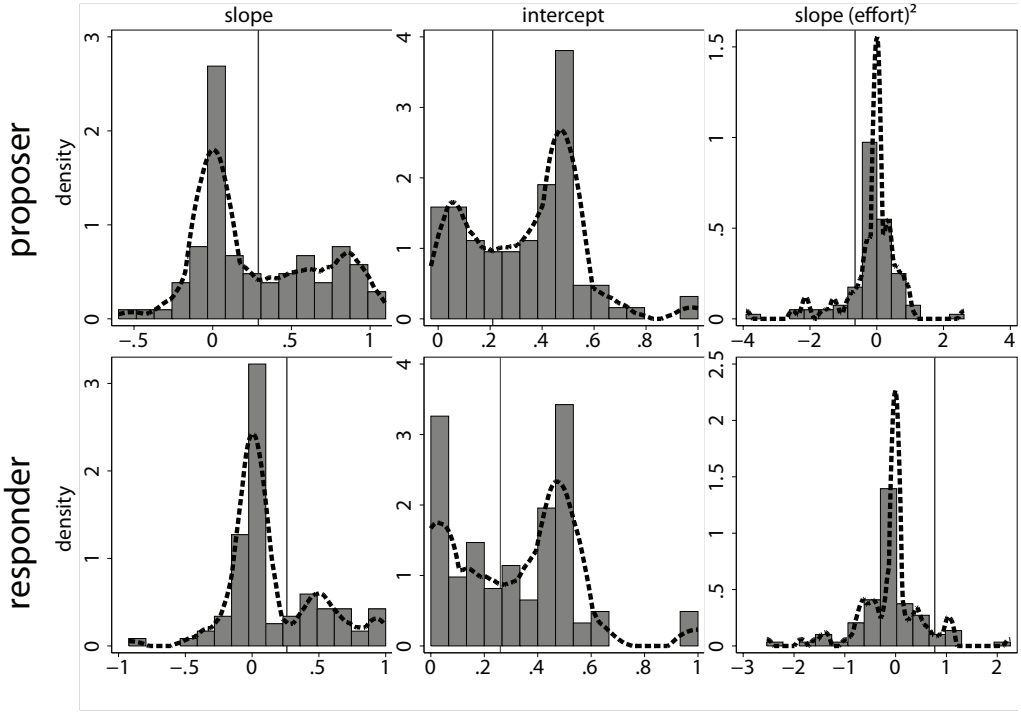

Figure 8. Kernel density estimations and histograms of the distribution of the individual regression parameters defining the critical values. The variables "slope" and "intercept" are determined using OLS regressions on the individual level (the player) with offer or acceptance threshold as dependent variable and responders' relative effort as independent variable. The variable effort^2 is determined using the same OLS regression and adding the squared effort as independent variable. The critical values are at the minimum density between the maxima of the bimodal distribution of "slope" and "intercept" and $+1$/-1 standard deviation for responder/proposer for effort^2. The vertical lines describe the respective critical values.

above the critical value are called equality player. Those with the `slope` and the `intercept` below the critical value are egoistic types. If a proposer has a `slope` above the critical value and the player's `effort`^{2} is above the critical value, the player is referred to as equity type. We call proposers who do not react on a squared effort (low slope of `effort`^{2}) but show a strong reaction on additional effort of the responder (high `slope`)"cherry pickers". The definitions are the same for responders, but with two obvious minor adjustments: We call those players equity, who are *below* the critical value of `effort`^{2}, while players above this critical value are called "cherry pickers".

B Proofs of propositions 1 and 2

B.1 Proof of proposition 1

Suppose $N_p = N_r = 1/2$ and $x \geq N_r$. Then $k_r \max[N_r - x, 0] = 0$ and $x - k_r \max[N_r - x, 0]$ is increasing with x and strictly positive for positive x for the responder, who will therefore accept. For the proposer, $k_p \max[N_p - (1-x), 0] > 0$ is increasing in x and equal to zero for all $x \leq N_r = N_p$, which leads to $U_p = (1-x) - k_p \max[N_p - (1-x), 0] \geq 0$. Consequently, the proposer will never offer $x > N_r$, and offering $x = N_r$ will be accepted. Suppose now that $N_p = N_r = 1/2$ and $x < N_r$. Then $k_r \max[N_r - x, 0] > 0$ can become greater than x for $k_r > 1$, which would lead to rejection. Thus, the proposer would have to offer at least the responder's threshold of $t^* = k_r N_r/(1 + k_r) \leq N_R$, which would be accepted. As $t^* \leq N_r = N_p$, the proposer's discount term $-k_p \max[N_p - (1 - t^*), 0]$ is zero, which makes the proposer's overall utility strictly positive. Hence, there exists an optimal offer t^* which will be accepted by the responder. The same argument holds in the case of equity norms given by $N_p = e_p, N_r = e_r$.

Thus, if the norm is shared and the responder's commitment is known by the proposer, she can always make an offer which is acceptable for both, so that normative conflict due to different commitments is excluded. ■

B.2 Proof of proposition 2

A proposer offers $x \geq t^*$ if $U_{p,accept} > U_{p,reject} = 0$.
Case 1a: Consider the case that $N_p = e_p, N_r = 1/2$ and $e_r \geq 1/2$. Then $1 - N_p \geq N_r$. The proposer's norm prescribes to offer e_r to the responder. Offering $x = 1 - N_p \geq N_r = 1/2$ yields $x - k_p \max[N_p - (1 - x), 0] \geq 0$ for the responder, which would be accepted, as the acceptance threshold of the responder is $\frac{k_r 1/2}{1+k_r} \leq 1/2$.

Case 1b: Consider now that the responder's effort is $e_r \leq 1/2$. The responder claims at least $t^* = \frac{k_r 1/2}{1+k_r} \leq 1/2$, but the proposer does not offer this threshold if the utility of the remaining part of the cake is lower than his indifference point of a rejected offer, which is a utility of zero. Solving the proposer's utility function $U_{p,accept}(x, N_r, k_r) = 0$ with respect to t^* and e_r returns a threshold of

$$\theta = \frac{k_p k_r - k_p - 2}{2k_r + 2k_p k_r} \geq e_r$$

.

If $N_p = e_p$, $N_r = 1/2$ and $e_r < \theta$, the proposer's utility from offering t^* is below zero (the utility of rejection). Hence, there is a set of subgame perfect equilibria with the proposer offering $x < t^*$ leading to rejection.

Case 2a: Now let $N_p = 1/2, N_r = e_r$ and $e_r \geq 1/2$. The proposer's norm prescribes to offer $x = 1/2$ to the responder. Offering $x = 1 - N_p \geq N_r \geq 1/2$ yields a utility of $(1-x) - k_p \max[N_p - (1-x), 0] \geq 0$, which would be accepted, as the acceptance threshold of the responder is $\frac{k_r e_r}{1+k_r} \leq 1/2$ for all $k_r > 0$ and $e_r \leq 1/2$.

Case 2b: Consider that the responder's effort is $e_r \geq 1/2$. The responder claims at least $\frac{k_r e_r}{1+k_r}$, but the proposer is only willing to offer this much if the utility of the remaining part of her share is higher than zero (her utility from of a rejected offer). Solving the proposer's utility function $U_{p,accept}(x, N_r, k_r) = 0$ with respect to e_r gives the threshold of

$$\theta = \frac{k_p k_r + 2k_p + k_r + 2}{2k_p + 2k_p k_r} \geq e_p$$

.

If $N_p = 1/2$, $N_r = e_r$ and $e_p < \theta$, the proposer's utility of offering t^* is below rejection. Hence, there is a set of subgame perfect equilibria with the proposer offering $x < t^*$ leading to rejection.

■

References

Adams, J. Stacy. 1965. "Inequity in Social Exchange." *Advances in Experimental Social Psychology* 2:267–269.

Berger, Josef, Morris Zelditch, Bo Anderson, and Bernard P. Cohen. 1972. "Structural aspects of distributive justice: A status value formulation." *Sociological theories in progress* 2:119–146.

Bicchieri, Cristina. 1990. "Norms of Cooperation." *Ethics* 100:838–861.

Bicchieri, Cristina. 2006. *The Grammar of Society : The Nature and Dynamics of Social Norms*. Cambridge, Mass. [u.a.]: Cambridge University Press.

Binmore, Ken and Avner Shaked. 2010. "Experimental economics: Where next?" *Journal of Economic Behavior & Organization* 73:87–100.

Blau, Peter M. 1964. *Exchange & Power in Social Life*. New Brunswick, London: Transaction Publishers.

Bolton, Gary E and Axel Ockenfels. 2000. "ERC: A Theory of Equity, Reciprocity, and Competition." *The American Economic Review* 90:166–193.

Brandts, Jordi and Gary Charness. 2000. "Hot vs. cold: Sequential responses and preference stability in experimental games." *Experimental Economics* 2:227–238.

Cameron, Lisa A. 1999. "Raising the Stakes in the Ultimatum Game: Experimental Evidence from Indonesia." *Journal of Economic Inquiry* 37:47–59.

Coleman, James S. 1990. *Foundations of social theory*. Cambridge; London: The Belknap Press of Harvard University Press.

Cook, Karen S. and Richard M. Emerson. 1978. "Power, Equity and Commitment in Exchange Networks." *American Sociological Review* 43:721–739.

Cook, Karen S. and Karen A. Hegtvedt. 1983. "Distributive Justice, Equity, and Equality." *Annual Review of Sociology* 9:217–241.

Dahrendorf, Ralf. 1958. *Homo Sociologicus. Ein Versuch zur Geschichte, Bedeutung und Kritik der Kategorie der sozialen Rolle.* Opladen: Westdeutscher Verlag.

DeMaris, Alfred and Monica A. Longmore. 1996. "Ideology, Power, and Equity: Testing Competing Explanations for the Perception of Fairness in Household Labor." *Social Forces* 74:1043–1071.

Dufwenberg, Martin and Georg Kirchsteiger. 2004. "A theory of sequential reciprocity." *Games and Economic Behavior* 47:268–298.

Durkheim, Emile. 1897/1997. *Suicide*. New York: Free Press.

Eckel, Catherine and Herbert Gintis. 2010. "Blaming the messenger: Notes on the current state of experimental economics." *Journal of Economic Behavior & Organization* 73:109–119.

Eckhoff, Torstein. 1974. *Justice : its determinants in social interaction*. Rotterdam: Rotterdam Press.

Ellickson, Robert C. 1991. *Order without law*. Cambridge, Mass.: Harvard University Press.

Elster, Jon. 1989a. *The cement of society: A study of social order*. Studies in rationality and social change. Cambridge: Cambridge University Press. Jon Elster.

Elster, Jon. 1989b. *The cement of society: a study of social order*. Cambridge: Cambridge University Press.

Elster, Jon. 1992. *Local justice*. New York: Russell Sage Foundation.

Falk, Armin and Urs Fischbacher. 2002. ""Crime" in the lab-detecting social interaction." *European Economic Review* 46:859–869.

Falk, Armin and Urs Fischbacher. 2006. "A theory of reciprocity." *Games and Economic Behavior* 54:293–315.

Fehr, Ernst and Simon Gächter. 2000. "Fairness and Retaliation: The Economics of Reciprocity." *Journal of Economic Perspectives* 14:159–181.

Fehr, Ernst and Herbert Gintis. 2007. "Human Motivation and Social Cooperation: Experimental and Analytical Foundations." *Annual Review of Sociology* 33:43–64.

Fehr, Ernst and Klaus M. Schmidt. 1999. "A Theory of Fairness, Competition and Cooperation." *Quarterly Journal of Economics* 114:817–868.

Fehr, Ernst and Klaus M. Schmidt. 2010. "On inequity aversion: A reply to Binmore and Shaked." *Journal of Economic Behavior & Organization* 73:101–108.

Fischbacher, Urs. 2007. "Ztree- Zurich Toolbox for Ready-made Economic Experiments." *Experimental Economics* 10:334–352.

Fischbacher, Urs and Simon Gächter. 2010. "Social Preferences, Beliefs, and the Dynamics of Free Riding in Public Goods Experiments." *American Economic Review* 100:541–56.

Fischbacher, Urs, Simon Gächter, and Ernst Fehr. 2001. "Are people conditionally cooperative? Evidence from a public goods experiment." *Economics Letters* 71:397–404.

Frohlich, Norman, Joe Oppenheimer, and Anja Kurki. 2004. "Modeling Other-Regarding Preferences and an Experimental Test." *Public Choice* 119:91–117.

Gächter, Simon and Arno Riedl. 2005. "Moral Property Rights in Bargaining with Infeasible Claims." *Management Science* 51:249–263.

Gross, Christiane and Peter Kriwy. 2008. "Fairness Judgements on the Allocation of Organ Donations - Results of a Factorial Survey." *Gesundheitswesen* 70:541–549.

Güth, Werner. 1995. "On ultimatum bargaining experiments – A personal review." *Journal of Economic Behavior & Organization* 27:329–344.

Güth, Werner, Carsten Schmidt, and Matthias Sutter. 2007. "Bargaining outside the lab - a newspaper experiment of a three-person ultimatum game." *The Economic Journal* 117:449–469.

Güth, Werner, Rolf Schmittberger, and Bernd Schwarze. 1982. "An experimental analysis of ultimatum bargaining." *Journal of Economic Behavior & Organization* 3:367–388.

Harris, Richard J. 1976. "Handling negative inputs: On the plausible equity formulae." *Journal of Experimental Social Psychology* 12:194 – 209.

Hechter, Michael and Karl-Dieter Opp. 2001. "Introduction." In *Social norms*, pp. XX, 429 S. : graph. Darst. New York: Russell Sage Foundation. Michael Hechter ... eds.

Heckathorn, Douglas D. 1989. "Collective Action and the Second-Order Free-Rider Problem." *Rationality and Society* 1:78–100.

Helbing, Dirk. 1992. "Mathematical models for behavioral changes by pair interactions." In *Economic evolution and demographic change*, edited by G. Haag, U. Mueller, and K.G. Troitzsch, pp. 330–348. Springer.

Hoffman, Elizabeth, Kevin McCabe, and Vernon Smith. 1996. "On expectations and the monetary stakes in ultimatum games." *International Journal of Game Theory* 25:289–301.

Homans, George Caspar. 1961. *Social behavior*. New York: Harcourt, Brace & World.

Hyman, Richard and Ian Brough. 1975. *Social Values and Industrial Relations (Warwick Studies in Industrial Relations)*. Boston: Blackwell Publishers.

Leventhal, Gerald S. 1976. "What Should Be Done with Equity Theory? New Approaches to the Study of Fairness in Social Relationships." *unpublished* .

Lewis, David. 1969. *Convention: A Philosophical Study*. Wiley-Blackwell.

Mikula, Gerold and Michael Wenzel. 2000. "Justice and Social Conflict." *International Journal of Psychology* 35:126–135.

Molm, Linda D., Jessica L. Collett, and David R. Schaefer. 2006. "Conflict and Fairness in Social Exchange." *Social Forces* 84:2331–2352.

Molm, Linda D., Nobuyuki Takahashi, and Gretchen Peterson. 2000. "Risk and Trust in Social Exchange: An Experimental Test of a Classical Proposition." *The American Journal of Sociology* 105:1396–1427.

Oosterbeek, Hessel, Randolph Sloof, and Gijs van de Kuilen. 2004. "Cultural Differences in Ultimatum Game Experiments: Evidence from a Meta-Analysis." *Experimental Economics* 7:171–188.

Opp, Karl-Dieter. 2001. "Norms." In *International Encyclopedia of Social and Behavioral Sciences*, edited by Paul B. Baltes and Neil J Smelser, pp. 10714 – 10720. Amsterdam: Elsevier.

Ostrom, Elinor, James Walker, and Roy Gardner. 1992. "Covenants With and Without a Sword: Self-Governance is Possible." *American Political Science Review* 86:404–417.

Parsons, Talcot. 1937. *The Structure of Social Action: Marshall, Pareto, Durkheim*. New York: Free Press.

Rabe-Hesketh, Sophia and Anders Skrondal. 2005. *Multilevel and Longitudinal Modeling Using Stata*. Stata Press.

Rabin, Matthew. 1993. "Incorporating Fairness into Game Theory and Economics." *American Economic Review* 83:1281–1302.

Raub, Werner and Jeroen Weesie. 1990. "Reputation and Efficiency in Social Interactions: An Example of Network Effects." *The American Journal of Sociology* 96:626–654.

Rauhut, Heiko. 2009. "Higher Punishment, Less Control?: Experimental Evidence On the Inspection Game." *Rationality and Society* 21:359–392.

Rauhut, Heiko and Ivar Krumpal. 2008. "Die Durchsetzung sozialer Normen in Low-Cost und High-Cost Situationen." *Zeitschrift für Soziologie* 5:380–402.

Reskin, Barbara F. 1988. "Bringing the Men Back in: Sex Differentiation and the Devaluation of Women's Work." *Gender and Society* 2:58–81.

Roth, Alvin E. 1995. "Bargaining experiments." In *The handbook of experimental economics*, edited by John H. Kagel and Alvin E. Roth, pp. 253–348. Princeton University Press.

Sanchez, Laura. 1994. "Gender, labor allocations, and the psychology of entitlement within the home." *Social Forces* 73:533–553.

Selten, Reinhard. 1967. "Die Strategiemethode zur Erforschung des eingeschränkt rationalen Verhaltens im Rahmen eines Oligopolexperimentes." In *Beiträge zur experimentellen Wirtschaftsforschung*, edited by Heinz Sauermann. Tübingen: J. C. B. Mohr (Paul Siebeck).

Snijders, Thomas A. B. and Roel J. Bosker. 1999. *Multilevel Analysis: An Introduction to Basic and Advanced Multilevel Modeling*. London, Thousand Oaks, Calif.: Sage Publications.

Spence, Andrew M. 1974. *Market signaling: Informational transfer in hiring and related screening processes*. Cambridge, Mass.: Harvard University Press.

Stouffer, Samuel A. 1949. *The American Soldier*. Princeton, N.J.: Princeton University Press.

Taylor, Michael. 1976. *Anarchy and cooperation*. New York: John Wiley and Sons.

Thye, Shane R. 2000. "A Status Value Theory of Power in Exchange Relations." *American Sociological Review* 65:407–432.

Thye, Shane R., David Willer, and Barry Markovsky. 2005. "From status to power: New models at the intersection of two theories." *Social Forces* 84:1471.

Ullmann-Margalit, Edna. 1977. *The Emergence of Norms*. Oxford: Clarendon.

Voss, Thomas. 2001. "Game-Theoretical Perspectives on the Emergence of Social Norms." In *Social norms*, edited by Michael Hechter and Karl-Dieter Opp. New York: Rusell Sage Foundation.

Wilcox, W.Bradford and Steven L. Nock. 2005. "What's Love Got to Do with It-Equality, Equity, Commitment and Women's Marital Quality." *Soc. F.* 84:1321.

Yamagishi, Toshio. 1986. "The Provision of a Sanctioning System as a Public Good." *Journal of Personality and Social Psychology* 51:110–116.

Young, Peyton H. 1993. "The Evolution of Conventions." *Econometrica* 61:57–84.

Young, Peyton H. 1994. *Equity. In Theory and Practice*. Princeton: Princeton University Press.