How Norms Can Generate Conflict: An Experiment on the Failure of Cooperative Micro-motives on the Macro-level

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Why does the adherence to norms not prevent conflict? While the current literature focuses on the emergence, maintenance and impact of norms with regard to cooperation, the issue of norm-related conflict deserves more attention. We develop a general game theoretical model of "normative conflict" and explain how transaction failures on the macrolevel can result from cooperative motives on the microlevel. We differentiate between two kinds of conflict. The first results from distinct expectations regarding the way in which general normative obligations should be fulfilled, the second from distinct expectations as to how the norm should restrain actions based on self-interest. We demonstrate the empirical relevance of normative conflict in a version of the ultimatum game. Our data reveal widespread normative conflict among different types of actors – egoistic, equity, equality and cherry picker. Our findings demonstrate how cooperative intentions about how to divide a collectively produced good may fail to produce cooperative outcomes.

Why is it that people consider our behavior improper despite our best intentions? Should norm adherence not prevent us from running into conflict? For example, why is it that well-intentioned, expensive presents are often rejected? For what reason is the offer of a seat on a bus angrily rejected by a sprightly elderly person? How to explain that getting "straight to the point" in a business meeting is often perceived as unmannerly?

These everyday occurrences are puzzling given that norms of behavior are generally regarded as cohesive. Even scholars of opposing schools of thought seem to converge around the idea that social norms emerge because they have positive consequences for society. In the functionalist approach, norms bridge the tension between individual self-interest and the functional prerequisites of society (Durkheim 1997[1897]; Parsons 1937; Dahrendorf 1958). The rational choice literature studies conditions under which individuals will overcome their self-interest in order to contribute to cooperation norms in society (Taylor 1976; Ullmann-Margalit 1977; Bicchieri 1990;

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Coleman 1990; Voss 2001). Interestingly, the emphasis of the arguments in both traditions is on the positive 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:xvi)

In our view, however, social norms do not only promote cohesion, they can also undermine it. In this article, we develop a theory of normative conflict that analyzes the conditions under which social norms are likely to create transaction failures. The main problem here is not to overcome self-interest but to agree on the norm that should be followed. It is remarkable how little attention has been devoted to normative conflict, although there are numerous examples of persistent, severe and harmful cases of normative conflict, all of which are relevant to sociology of science, organizations and economics.

For example, while most academic disciplines agree on what makes a "good" publication, two norms coexist in sociology: publishing in books and publishing in peer-reviewed journals (Clemens et al. 1995). Publications have an enormous influence when it comes to reputation, grant acquisitions or getting a job. Especially in mixed genre departments, however, finding the right metric of merit may lead to conflicts and prolonged faculty meetings due to conflicting opinions.

Similarly, multiple norms for signaling and receiving credit for authorship coexist between and within different academic fields (Hudson 1996; Tscharntke et al. 2007), e.g., alphabetic ordering, bracketing (with the main contributor as the first author and the supervisor at the end), ordering based on merit (in a decreasing order based on relative contributions), or even multiple first authors (with a footnote identifying all authors who contributed equally to the work). If norms clash and authors cannot agree, fruitful collaborations may not occur and manuscripts may remain unpublished.

These examples demonstrate the disintegrative character of social norms, providing the underlying intuition of our theory of normative conflict. The novelty of our contribution is threefold: First, we analyze how norms, each of which may be perfectly fine, may cause problems if they conflict. Second, we show how experimental data can be used to classify people according to their norms. In particular, we introduce a new experimental design yielding fine-grained measures of different normative types in the population and develop statistical methods for extracting and disentangling these types. Third, we identify two elements of norms, i.e., content (the basic rule to follow) and commitment (the balance between self-interest and norm), and investigate which of them is more responsible for conflicts.

Our analysis further contributes to the discussion of the micro-macro links in sociology (Raub et al. 2011) by providing an in-depth understanding of the emergence of normative conflict from cooperative intentions. This is done by developing a game theoretical model of conflicting distribution norms for which we assume heterogeneous populations regarding actors' normative expectations. Here, *normative conflict* is understood as transaction failure resulting from different expectations.

A Perspective of Normative Conflict

To specify the concept of normative conflict, we can distinguish two elements that constitute the structure of social norms. We define a *social norm* as a commonly

held expectation of how an actor ought to behave, which is enforced by sanctions in case of violations.[1] Within a social norm, two elements specify the factors that generate behavioral expectations: the kind of action that should be done, on the one hand, and the intensity of the action, on the other. We term the first element *normative content*, which may be defined as the kind of behavior that is prescribed or proscribed in a given situation. It provides information about which of the situation's characteristics should be evaluated when choosing an action. We term the second element *level of normative commitment*, indicating that social norms usually require an actor to restrict self-interest in favor of another person's or group's well-being. Consequently, we define this element as the extent to which an actor should sacrifice self-interest to comply with the norm. The level of normative commitment is not fixed. While some norms may require strong restrictions, others are less demanding.

The level of normative commitment and the normative content are triggered by normative cues. These serve as context-specific signals, specifying which of the many possible norms should be applied and to what extent. However, there are sometimes many and ambiguous cues. Hence, choosing the right cues is important.

Paradoxically, actors may adhere to social norms, believe they behave correctly and, nevertheless, experience conflict. Consequently, we can define *normative conflict* as the transaction failure resulting from actors holding partially(at least) exclusive normative expectations. The distinction between content and commitment of a norm enables us to classify two different types of normative conflict.

The first source of normative conflict could be that each of a number of actors regards a different commitment as appropriate. It may also be that people share a norm but some of them act, to some extent, as free riders. A robust finding states that the gradual decline of cooperation is driven by the fact that there are some people who do not want to contribute their fair share, even if they accept the need to provide the good (Yamagishi 1986; Ostrom et al. 1992). Fischbacher and Gächter (2010) study this dynamic, showing that only minor undercutting leads conditional cooperators to reduce their efforts. Thus, few shirkers can lead to a global emergence of conflict on the macro-level.

The second source of normative conflict may be 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 military merits or the fact that someone was married and had children should be considered important for an early demobilization after World War II (Stouffer 1949). Thus, attributes of working conditions, family status or having children may serve as cues which determine the allocation of scarce goods (such as money or demobilization).

Conflict may also emerge if some people do not accept certain cues recognized as valid by other groups. Think of a group of employees in a firm calling for equal pay in contrast to a second group demanding a payment scheme based solely on added value.

Bargaining Norms as an Exemplification of Normative Conflict

We further elaborate our concept of normative conflict by exemplifying it in the framework of distributive justice norms.

In these contexts, social norms can be thought of as a function mapping individuals' characteristics to expected outcomes. However, it is often not clear (1. which of these characteristics serve as a valid cue, (2. whether there is consensus about the validity of the respective characteristics, and (3. what is the implied degree of normative commitment.

Conditional and Unconditional Bargaining Norms

The greatest emphasis in the literature has been placed on identifying which individual characteristics are considered valid in a certain context. In a seminal work, Eckhoff (1974) identifies fundamental norms, or rules, that can be roughly distinguished as to whether they do or do not take individual characteristics, such as a person's needs, efforts or status, into account.

Some norms, *equality norms*, can be considered *unconditional* as they do not rely on individual characteristics and treat people as equal (Jasso and Opp 1997). The demand for these norms often increases when harmony in a group is paramount (Leventhal et al. 1980) and when people interact over a long period of time. As long as the persons involved are not too different with respect to need, status or investments in a project, equality norms are the method of choice. Equality norms are cognitively undemanding, exemplified by the fact that young children often apply them, while older children are capable of using more sophisticated rules.

Other norms allocate resources *conditional* on individual characteristics. They prescribe, for example, allocations as a function of status or the centrality in networks.[2] Wages are often influenced by these rules such as seniority-based salaries (Stainback et al. 2010). The status of the owner can also affect the perceived value of a good. At auctions, golf clubs owned by John F. Kennedy sell for much higher prices than "ordinary" golf clubs (Thye 2000; Thye et al. 2005). Under different circumstances, need has been found to be the only valid criterion; nevertheless, efforts and merits are relevant in other contexts. The allocation of organs for transplant is an important application of this norm (Elster 1989). There is a lively debate about who should receive an organ if demand exceeds supply. Should the chances of survival, the time on the waiting list, or the responsibility for taking care of own children count as valid cues? The acceptance of cues also depends on the selector's characteristics (Ubel et al. 2001), and the need may be perceived as more important among close friends rather than strangers (Lamm and Schwinger 1980).

Among the conditional norms, the merit-based *equity norm* is the most relevant for our study. Equity norms assert that the individual input is the only valid criterion in determining output. Those who invest more effort will 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

valuable 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.

Normative Conflict Over Commitments

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 to what extent this cue should bind the decision maker. If two persons agree that an equality norm should be applied, they may still run into conflict if one of them tries to take advantage and claims a bigger share (see Figure 1a). The same kind of conflict may emerge if both agree on an equity norm, but one of them discounts the other person's effort and offers a smaller share. The conflict over commitments arises over balancing the norm with individual self-interest, and it may be present even if all actors agree on the same norm.

Normative Conflict Over Contents

In the framework of bargaining norms, equity and equality norms can solve a cooperation problem. Moreover, both norms have the same implications if effort is equal: outcomes should be split equally. But if inputs are different, both norms imply different allocations (see Figure 1c). A low contributor claiming equal shares would not agree on getting only his input share. However, someone with an equity norm who contributed larger amounts would not agree on handing over more than the other's input share. In this case, cooperative intentions are not enough to reach a cooperative solution. Thus, a population has to coordinate on one principle to avoid conflict. Normative conflict over contents results from the balancing between two distinct and at least partially exclusive norms. This kind of conflict may exist even if all actors fully comply with their respective norms in the absence of any self-interested reasoning.

Derivation of Hypotheses on Normative Conflict

A General Model of Normative Behavior and Its Application to the Ultimatum Game

We derive the existence of normative conflict from a simple and tractable model that has become prominent in the experimental literature on social norms. We prove two propositions, namely that (1. normative agreement is always possible if subjects agree on the same normative cue, and that (2. conflict may be unavoidable if there is disagreement about the underlying cue. To sketch the proof of proposition 2, think of someone who made a major contribution to a common project and believes he or she should be compensated accordingly. The less willing he is to accept an equal split, the stronger his commitment to the equity principle. The interaction may result in conflict if his interaction partner contributed only a little but strongly claims an equal allocation. We prove the existence of a threshold as a function of individual contributions

and the commitment to the norm. Conflict is likely to emerge if the differences in contributions go beyond this threshold.

To investigate these questions, we apply general theories of normative behavior and analyze conditions under which alternative norms are in conflict with each other. Unlike other models of normative behavior,[3] Christina Bicchieri's (2006) model is flexible with respect to normative content, allowing for analysis of conflict between normative contents.[4]

The workhorse of our theoretical as well as experimental investigation of normative conflict is a variant of the *ultimatum game* experiment (Güth et al. 1982). This classical

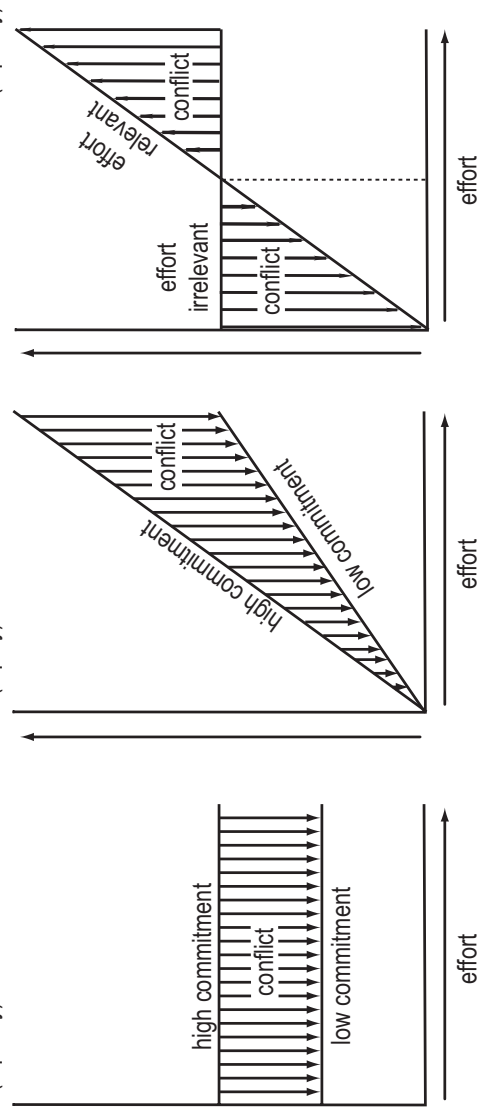


Figure 1. Illustration of Normative Conflict Resulting from the Adherence to Different Normative Commitments (a and b) or Different Normative Contents (c)

Note: In (a), the normative conflict arises between one person adhering strongly to the unconditional equality norm and another adhering only weakly to that norm. The same applies in (b) for the equity norm, which is conditional on relative contributions to a "project." In (c), the conflict is caused by the different requirements of the unconditional (equality norm) and the conditional equity norm.

game is regarded as a parsimonious measure for distributive justice and fairness norms: a proposer and a responder bargain over a given amount of money π, called the *pie*. The proposer offers a share of the pie to the responder. If the responder accepts the offer, he or she receives the share and the proposer may keep the rest of the pie. If the responder rejects the offer, the pie 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 may 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 pie are rare, and close-to-equal splits are the most frequent outcome (Roth 1995). This matches our definition of social norms that there is: (1. a commonly known behavioral expectation (2. among the responder and the proposer, (3. which is enforced by sanctions in case of norm violations (here: rejection of the offer).

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; production of the pie. Thus, the proposer and the responder may build claims with respect to their efforts.

For the simplicity of the argument, assume that the utility of player $i \in [p = \text{proposer}, r = \text{responder}]$ of a share of the pie $x \in [0,\pi]$ can be evaluated as a function of the material outcome x, the content N_i of his/her norm, and the commitment $k_i \geq 0$ to that norm.[5] The general formulation of normative behavior allows us to include different normative contents N_i for the proposer and the responder, facilitating the analysis of normative conflict. Norm N_i denotes the amount a player thinks he or she should receive under his/her norm. To define the content of N_i, we 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). It implicitly attributes egalitarian norms to the subject's utility function which regards

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

as the normative solution (which reduces to 50:50 in the case of $n = 2$ players).

However, other players may have internalized the equity norm instead.[6] In this case, a player takes the relative effort into account when evaluating the material outcome in the light of his or her normative expectation. The previously introduced equity norm is thus given by the respective relative effort

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

For the following discussion we normalize the size of the pie to 1 such that we can denote the proposer's effort by e_p and the responder's effort by $1 - e_p$.

Furthermore, players can be committed to "their" norm to a different extent. 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 large k_i social norms have profound behavioral implications. For the following analysis we assume *common knowledge* of the players' efforts, their norms N_i, and their normative commitments k_i.[7]

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

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

If the responder accepts an offer x,

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

is the proposer's utility, and

$$U_{r,accept}(x, N_r, k_r) = x - k_r max[N_r - x, 0] \quad (4)$$

is the responder's utility.

However, in the case of full commitment ($k_i \rightarrow \infty$), 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 equations 3 and 4.[8] Consequently, a responder accepts an offer x if his or her related utility is at least 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 $U(x) = x$. Then, the acceptance threshold is given by standard game theory with $t^* = 0$. The proposer anticipates 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 (equations 3 and 4), 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, Equation 3 becomes

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

while for the responder who holds an equity norm, Equation 4 becomes

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

For the case of an equality norm, the proposer's utility is given by

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

and the responder's utility 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

$$t^* = \frac{k_r N_r}{1 + k_r}. \quad (5)$$

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

Application of the Model to Study Normative Conflict

We can now 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

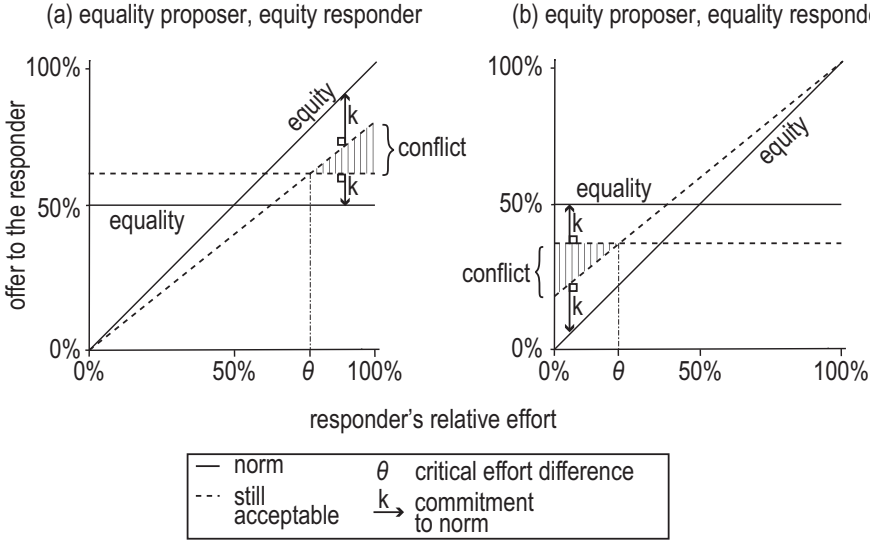
If proposers and responders share the same norm, that is, if $N_p = N_r = 1/2$ or if $N_p = e_p$ and $N_r = (1 - e_p)$, and if the normative adherence (as given by N_p, N_r, N_p, N_r) is common knowledge, there is no normative conflict, i.e., there exists an offer $x \geq t^*$, which will be presented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

Proof (See Online Appendix A.1)

On the other hand, proposers and responders may adhere to different norms, which can cause normative conflict. Intuitively speaking, an equity proposer with a high level of effort will not agree to offer the equal split to an equality responder because he or she has contributed too little. Conversely, an equality proposer who has contributed only a little will not agree to offer only his or her effort level. Figure 2 is meant to illustrate the argument in an intuitive way.

Normative conflict between holders of different norms occurs if the differences in 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 3 and 4 from the other side: as we already know the acceptance threshold for the responder, we are interested to see for which differences in efforts the proposer's 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 relative effort. If an equity proposer contributed more than the threshold ($e_p > U$) or an equality proposer less than the threshold ($e_p > U$), both parties receive a higher utility from a rejected rather than an accepted offer.

Figure 2. Illustration of Normative Conflict Due to Different Normative Contents



Note: The θ denotes the threshold of relative effort 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, though 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%.

Proposition 2

Let θ *be the critical threshold of the proposer's relative effort given by*

$$\theta = \begin{cases} \dfrac{k_p k_r - k_p - 2}{2k_r + 2k_p k_r} > \dfrac{1}{2} & \text{if} \quad N_r = (1 - e_p), N_p = \dfrac{1}{2}, \\ & \qquad k_p > 1, \text{and } k_r > \dfrac{2}{(k_p - 1)}, \\ \dfrac{k_p k_r + 2k_p + k_r + 2}{2k_p + 2k_p k_r} < \dfrac{1}{2} & \text{if} \quad N_r = \dfrac{1}{2}, N_p = e_p, \\ & \qquad k_p > 1, \text{and } k_r > \dfrac{2}{(k_p - 1)}, \\ 1 & \text{otherwise}. \end{cases} \tag{6}$$

or if N_p= *and*

If $N_p = e_p$, $N_r = 1/2$, and $e_p > U$, rejection is a subgame perfect equilibrium for certain values of k_p and k_r. If $N_p = 1/2$, $N_r = (1 - e_p)$, and $(1 - e_p) > U$, rejection is a subgame perfect equilibrium for certain values of k_p and k_r.

Proof (See Online Appendix A.2)

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

Hypotheses

Propositions 1 and 2 demonstrate that normative conflict does not occur if proposer and responder adhere to the same norm and have common knowledge about their normative types. This holds for all effort levels and normative commitments. If proposer and responder hold different norms, however, normative conflict is inevitable if their differences regarding efforts and normative commitments are too large. The conclusion from both theoretical analyses, both with common knowledge and without, is the following:

> *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 arise. In contrast, if the differences in their effort levels are large, the likelihood of conflict is high. This conjecture is illustrated in Figure 2, leading us to conclude the following:

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

Method

The Ultimatum Game

In order to test our theory, we conducted a variation of the ultimatum game experiment Güth et al. (1982). 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.

Real Effort Task

Our first variation of the ultimatum game introduced a real effort task by requiring subjects to invest their own time *prior* to the experiment. Thus, each subject could decide to invest spare time in order to earn more money later on. Five days before the experiment, subjects received a seven-page text of a *Wikipedia* entry on Westminster Palace by email.[9] An accompanying letter informed subjects that prior reading of the text would influence earnings in the experiment. We chose a rather specific topic to ensure that everyone had to learn the text and nobody could benefit from his or her respective field of study (such as mathematics or paleontology). At the beginning of the laboratory experiment, subjects had to answer 20 questions about Westminster Palace with five answer categories each. For each correct answer, subjects earned 1 Euro. Thus, the maximum earning was 20 Euro. In the ultimatum bargaining part, the joint earnings of two randomly drawn players were pooled to form the pie. This procedure was designed to induce a feeling of personal effort and inherent monetary earnings.[10]

Strategy Vector Method

Our second variation of the ultimatum game introduced an enhanced method for measuring normative behavior on an individual level, called the *strategy vector method* (Selten 1967; Fischbacher et al. 2001; Falk and Fischbacher 2002). A "conventional" ultimatum game using efforts asks a proposer to offer the responder a certain amount of money. The responder can accept or reject this offer while both players know each other's particular effort levels. This method only allows us to test offers and their acceptance for two particular effort levels. In contrast, our implementation of the strategy vector method allows us to measure the offer and the acceptance for every possible combination of effort levels. For example, from the pool of subjects, two subjects, *i* and *j*, were matched by the computer.[13] Player *i* was informed that he or she earned 10 Euro in the quiz but was not told about player *j*'s effort or role in the experiment. Instead, we asked subject I about all decisions for every possible effort level in both roles. In a first step, he was asked in the role of proposer how much he offered if responder *j* contributed 0 Euro, 1 Euro, 2 Euro, …, 19 Euro, 20 Euro. In a second step, the roles were reversed, and player *i* was asked about the minimal offer she was 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 proposers and 21 decisions as responders. In a third step, the computer determined the joint pie size of players *i* and *j*. Suppose that player *i* contributed 10 and player *j* 15 euros to the pie. The computer then 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 out, if the offer was as high as, or higher than, the responder's acceptance threshold, otherwise the money was lost.

Procedure and Participants

The experiment was conducted using the *z-Tree* software developed by Fischbacher (2007). At the beginning of each session, subjects were randomly assigned to one of the

computer terminals. General instructions regarding the procedure were given on paper. Subjects were informed about the knowledge quiz, and it was once again pointed out that reading the text would have considerable influence on earnings. After completing the quiz subjects received instructions for the ultimatum game. Next, they had to respond to test questions regarding the rules of the game up to three times, to verify that they understood the rules. The experiment started when there were no further questions. Communication was prohibited from that point onward. After completing the ultimatum game, subjects were paid at their seats.

The participants were 92 undergraduate students of the Universität Leipzig from a wide range of academic disciplines. Forty-seven subjects were male and 45 female. The experiment was conducted in two separate computerized laboratories. Proposers and responders were located in separate rooms.

Measures

The content of a player's norm is measured by the degree to which the relative offer determines his or her decision. We discuss the classification for proposers, but classifying responders follows the same criteria. The strategy method elicits every offer for every relation of effort levels between proposer and responder. These response profiles allow us to estimate for each proposer an individual linear function of how his or her relative effort determines each respective offer. This function can be expressed by an individual regression model for each proposer, specifying the relative effort as the explanatory and the offer as the outcome variable. The regression yields two parameters, intercept and slope, whose values are used to classify proposers into those who adhere to the content of the equality or equity norm and those who do not adhere to social norms but to selfish reasoning. More specifically, we can measure:

Content of equity norm: The offer/acceptance function of an equity player is characterized by a steep slope regarding how effort determines offers and acceptance thresholds, respectively.

Content of equality norm: The offer/acceptance function of an equality player is characterized by a flat slope regarding how effort determines offers and acceptance thresholds, respectively. The intercept is relatively high and close to the equal share of 50 percent.

No norm adherence: Egoistic players are characterized by a flat slope and a low intercept.

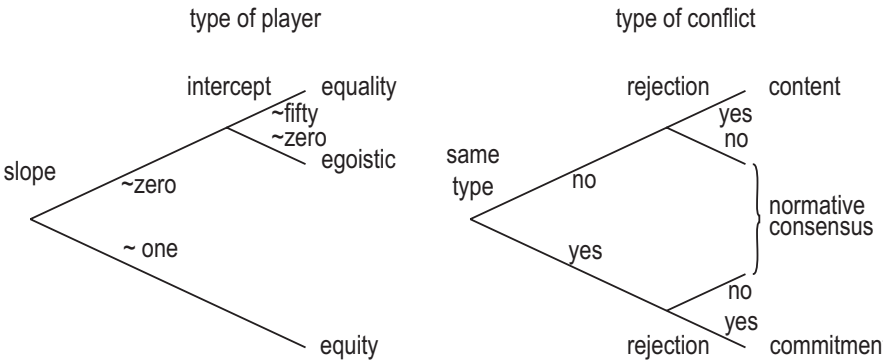
Normative conflict: Our measure of conflict is the rejection of an offer. We measure norm-related conflict over contents by the rejection of an offer made by a responder of a different normative type. In contrast, a rejection of an offer among similar normative types represents norm-related conflict over commitments. See Figure 3.

Results

Macro-level Conditions for Normative Conflict

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

Figure 3. Classification of Proposer and Responder Type (Left) and Type of Conflict (Right)



Note: Subjects Subjects are assigned to types according to specific thresholds. The respective thresholds for slope,intercept, and slope are determined using a kernel density estimation.

conflict becomes feasible. We examine the empirical validity of these conditions by employing multilevel models. These quantify the impact of effort on the proposer's offer and the responder's acceptance threshold and, more importantly, on the variance in the subjects' level of normative commitment in their consideration of effort. 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, multilevel models estimate the average intercept and the standard deviation of this intercept across individuals in the population.[11]

The first condition for measuring normative conflict requires that subjects have to perceive the ultimatum game as a norm-relevant situation. Thus, almost every subject has to believe that almost every other subject has a "normative" expectation and not a selfish one. A selfish expectation would correspond to the game theoretical concept of subgame perfect equilibria, and players with "normative" expectations offer considerable amounts and reject low offers.[12]

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

The empirical results of Table 1 confirm the first condition: subjects understand the game as a norm-relevant situation. 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 0. The intercept of the proposer shows that even when the responder contributes nothing, proposers offer 33 percent of the pie, on average. Furthermore, the responders' positive intercept of 31 percent in the fixed effects part of the model reveals that responders are punishing norm violations at their own cost, supporting that responders perceive the ultimatum game as norm relevant.

Table 1: Linear Multi-level Models for the Impact of the Responder's Efforts on the Proposer's Offers and Responder's Relative Acceptance Thresholds

	Proposer's Relative Offer	Responder's Relative Threshold
Fixed effects		
N=1931 decisions		
Intercept	.33***	.31***
	(.021)	(.025)
Responder's relative effort	.29***	.15***
	(.041)	(.037)
Random effects		
J = 92 subjects		
Standard deviation intercepts	.20***	.24***
	(.015)	(.018)
Standard deviation responder's efforts	.39***	.35***
	(.030)	(.027)
Correlation (responder's efforts/intercepts)	-.84***	-.60***
	(-.090)	(-.065)
Log-Likelihood	2478.7	295.4
Observations	1931	1931

Note: Effort, offers and acceptance thresholds are normalized. This normalization expresses the efforts of responders relative to the efforts of proposers (scaling from 0-1). Further, the offers and acceptance thresholds are expressed in relation to the pie sizes (scaling from 0-1). Standard errors in parentheses.
*p < .05 **p < .01 p*** < .001

The second condition requires that effort have a significant impact on subjects' fairness decisions. This is in contrast to typical ultimatum game experiments, in which endowments are supposed to compensate the efforts of subjects, i.e., the time spent in the lab (for an overview, see Güth 1995). In these scenarios, effort is usually the same for all subjects, so that the straightforward allocation norm is to split the pie equally. In contrast, our method of generating different efforts to obtain the endowment introduces 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 for normative conflict.

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

Result 2 supports the second condition. A substantial fraction of 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 pie, she receives a 29 percent higher offer and has a 15 percent higher acceptance threshold than if the proposer contributed the full pie. The empirical relevance of effort, therefore, provides the precondition for heterogeneity in normative expectations.

A third macro-level condition is that subjects have to differ in their evaluation of effort as a norm-relevant criterion. In more formal terms, 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").

Result 3: *The population is heterogeneous in terms of the effects of subjects' efforts 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 1.

Fourth, normative conflict over commitments requires that some actors believe the norm should strongly restrict the pursuit of self-interest, while others believe in mild restrictions. We suspect that different levels of normative commitment occur in situations in which actors have opposing interests. Such asymmetric situations are given if an actor who is worse off claims that he or she ought to be compensated by someone who is better off. The ultimatum game is an ideal representation of such asymmetric situations. Equity players with a low commitment can be understood as players 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 satisfied with less.

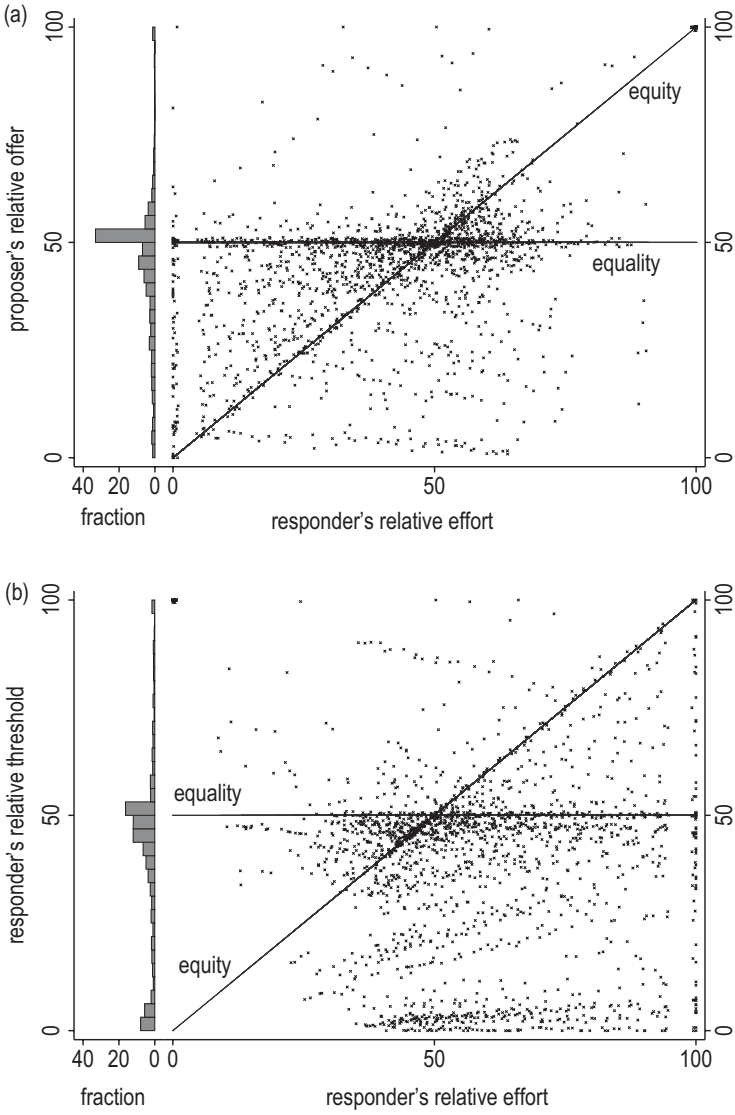
Result 4: *The population is heterogeneous in the subjects' reaction to low effort levels*.

Result 4 is supported by the large and significant standard deviation of the intercept in the random effects part of Table 1. 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 an inversed pattern of low intercepts and high slopes, and *egoistic players* with low intercepts and low slopes. While the first two types can be explained by normative behavior, 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.

Figure 4 illustrates the proposers' offers and responders' acceptance thresholds for given responders' efforts. In the top figure, it can be seen that most offers cluster around lines corresponding to equity and equality norms. There are also a few "hyper-fair" offers. Further, a large portion of offers are located between the equity line and the equality line or even below both lines. Thus, some proposers are biased by self-interest. Although some proposers increase their prospective share by making moderately low offers, few of them play the subgame perfect equilibrium solution and offer the minimum.

Among responders, there are surprisingly many who adhere to the equality norm and are willing to punish offers below 50 percent with rejection. This is an unusual

Figure 4. Proposer's Relative Offers as a Function of Responder's Relative Effort (a) and Responder's Relative Acceptance Thresholds as a Function of the Responder's Relative Effort (b)



Note: 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 (a) and acceptance thresholds (b). 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, although there is considerable noise too. Responders cluster less around equity and equality lines. They show more risk-averse behavior than proposers, indicated by a third cluster of considerably lower acceptance thresholds.

finding, as many previous studies report that offers of 40 percent and above are almost always accepted. In contrast to results for proposers, the "attraction" to pure equity and equality norms is not as pronounced for responders. As a result, the variance in the responders' decisions is much higher. Further, the histogram on the left shows that 20 percent of the acceptance thresholds are below 20 percent. The respective players are willing to accept very low offers, sometimes even if they contributed much more than their proposers.

The Micro-level Roots of Normative Conflict

How can we understand the structures on the macro level by micro-level behavior? Figure 5 depicts four typical proposer profiles and Figure 6, four typical responder profiles. Player 2 represents a pure equality player. In the role of proposer and of responder, player 2 offers and claims always 50 percent, regardless of the differences in effort between proposer and responder. Meanwhile, player 3 shows pure equity, always offering exactly as much as the responder's effort and always demanding at least his or her effort as a responder. A third type of player is one who plays the subgame perfect Nash equilibrium. Player 13 constantly offers and accepts the smallest possible positive amount of 50 cents. Consequently, we call this player type the *egoist*. We even found another type, showing an intriguing hybrid behavior between self-interest and norm compliance. This fourth type plays according to the equity norm as long as he is a relatively high achiever but switches to the equality norm if he is a relatively low achiever. Note player 20 as proposer and player 36 as responder of this type. We call these players *cherry pickers* as they seem to adhere to norms but "pick" the norm which serves their self-interest best.

In order to classify the subjects into normative types, players are categorized according to their reactions to the responders' efforts. We classified the player's proposer and responder behavior separately, looking at the offers (and acceptance thresholds) in the role of proposers (and responders). The abstract idea of classifying individuals into normative types is implemented by using OLS regressions which take effort as a predictor for individual offers and acceptance thresholds. We made sure that the algorithm is not biased by imposing the normative types on the empirical data. In contrast, subjects were assigned to types in a purely data-driven way. More specifically, our approach classifies the individual strategies according to (the respective intercepts and slopes of returned from individual regressions). We categorized players with a low slope and a high intercept as equality, with a low slope and a low intercept as egoist, with a high slope as equity, and with a quadratic slope as cherry picker. (See the online appendix for a discussion of our classification algorithm.)

The insets in figures 5 and 6 describe the resulting distribution of different proposer and responder types. More than half of the proposers adhere to equality norms and about 40 percent to equity norms, while cherry pickers and egoistic proposers are the exception (3% each). Subjects are more risk averse if they are in the role of the responder. While 48 percent adhere to the equality norm, the fraction of equity players is only 25 percent, and the fraction of egoistic responders, 20 percent. The proportion of cherry pickers is small (3%).

Aggregation of Norm Adherence on the Micro-level to Normative Conflict on the Macro Level

Subjects who are either equity or equality types in the role of proposer or responder predominant in our data.[13] This means that any given proposer/responder can be described by his or her norm (equity or equality) and his respective commitment to that norm. We take all possible interactions into account and not just those pairs who were actually matched in the experiment. This procedure does not bias our results

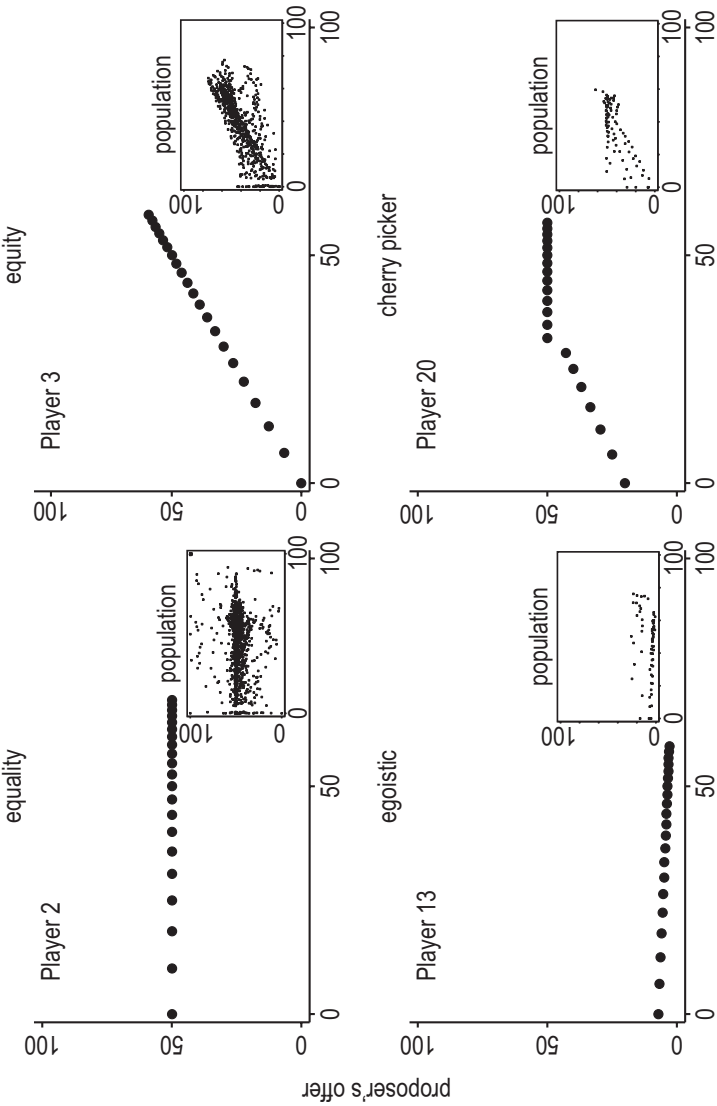


Figure 5. Offers of Selected Players

Note: 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.

because each subject had to respond as proposer and responder *before* they were actually assigned to a role and matched with their opponent, so no learning effects could occur.[14] Thus, we can base our estimation on 4,830 interactions because each of the $n = 70$ subjects can be matched as proposer with each of the other subjects as responder, resulting in $n(n-1)/2 = 2{,}415$ interactions. Conversely, each subject can be matched as responder, resulting in an additional 2,415 interactions. As this procedure implies that each subject made several decisions that are not independent, we correct for inflated standard errors by clustering for subjects. Comparable analyses taking only

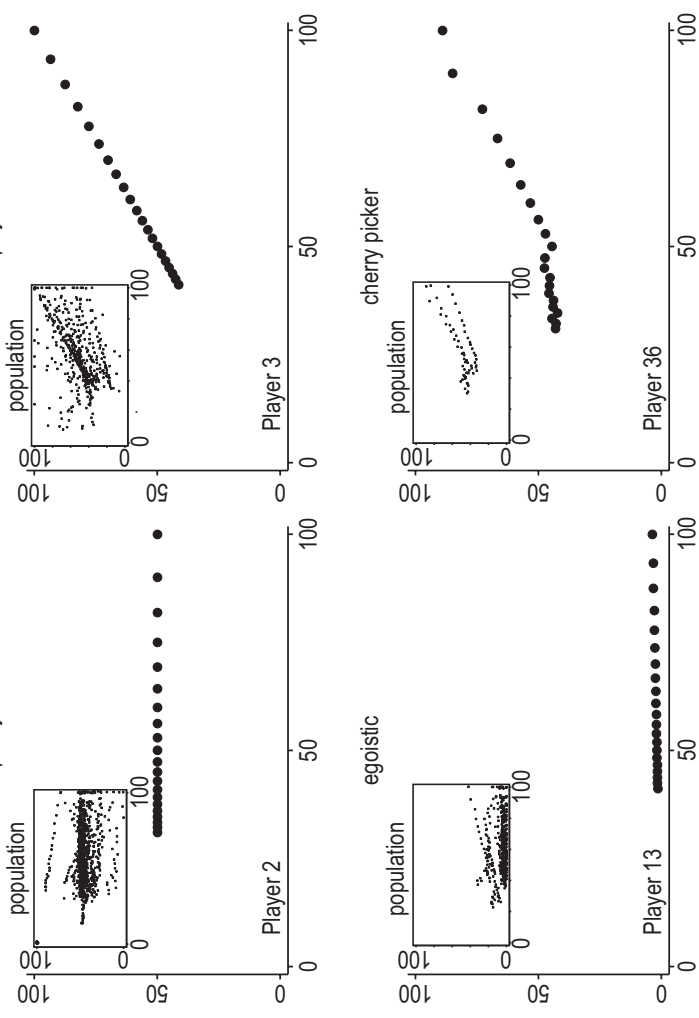


Figure 6. Acceptance Thresholds of Selected Players

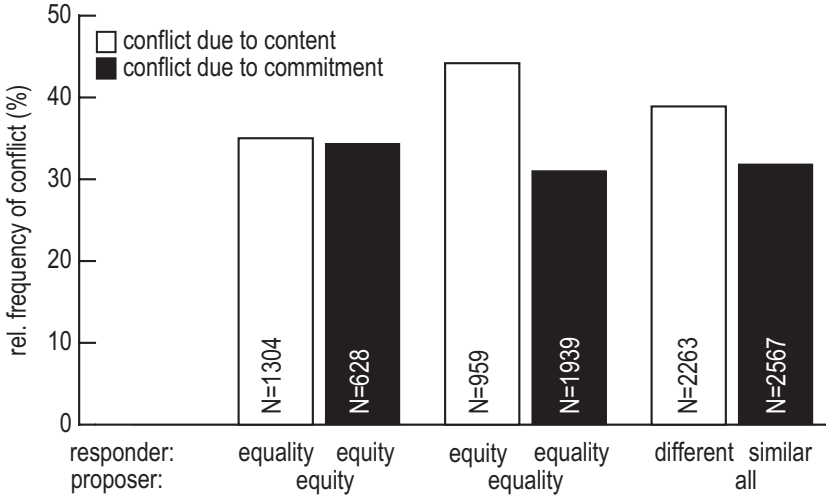
Note: We find 52% (n=48) equality responders (upper left), 25% (n=23) equity responders (upper right), 20% (n=18) egoistic responders (lower left), and 3% (n=3) cherry pickers (lower right). The insets depict the superposition of all individual decisions in the population classified as belonging to the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

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 Result 5, we simulated the interactions of each proposer with each responder using our empirical data. Figure 7 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. From 2,263 interactions among holders of different normative contents, 39 percent (885 cases) end in rejection, while in only 32 percent (822 out of 2,567) of the interactions, conflict emerges among holders of different levels of normative commitments. A logit model confirms the general results from Figure 7, estimating significantly higher probabilities of conflict if actors do not share the same normative content (robust standard errors, $z = 5.14$, $p < .001$).[15] The percentage of content-related conflict is even higher if only equality proposers are considered (44% or 426 out of 959 interactions), whereas the relative frequency of conflict due to commitment between equality proposer and equality responder is significantly lower (31% or 605 out of 1,939 interactions result in conflict, $z = 3.82$, $p < .001$). However, 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 as in the case when the responder adheres to the equality principle (36% or 459 out of 1,304 observations,

Figure 7. Frequency of Conflict in a Situation Where Proposer and Responder Adhere to Different Normative Contents or Commitments



Note: N denotes the absolute frequency of the respective interactions. The y-axis denotes the relative frequency of a conflict occurring, measured by the rejection of the offer.

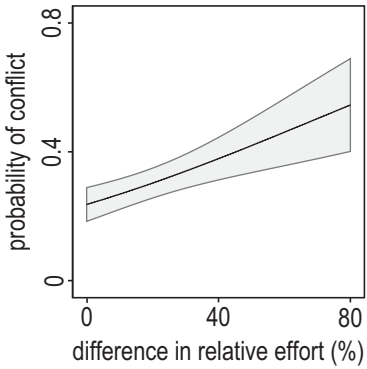
$z = .18$, $p = .861$). Overall, the data supports our claim that conflict due to different normative contents is an important notion to understand the interrelation between social norms, cooperation and conflict. The insignificance of the last result, however, somewhat challenges our general theoretical claim but may well be a result of the strategy method, which is sometimes criticized for its hypothetical character.

Finally, we confirm effort as the underlying source of normative conflict as stated in Hypothesis 2. The differences between the proposer's and responder's effort spark off the conflict over alternative norms, as illustrated in Figure 1.

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 8 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 reveals that 25 percent of the subjects end up in conflict if their efforts are similar, while 55 percent do so when one party contributed almost everything and the other almost nothing.

Figure 8. Logistic Regression Quantifying the Impact of Differential Effort on Conflict



	conflict
Intercept	–1.172***
	(0.148)
Differences in relative effort	0.017***
	(0.005)
Interactions	8190
Clusters by subjects	92
Log-likelihood	–4897.05

Clustered standard errors in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Note: The larger the differences in the relative effort contributed to the common pool, the higher the probability of conflict. The table on the left reports logit estimates and standard errors while 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 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., , 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 proposer and all other subjects in the role of responder. Clustering of subjects in these interactions is taken into account by calculating robust standard errors.

Discussion

This article outlines a new theoretical perspective on social norms in which conflict is considered an inherent component of such norms. The heterogeneity of norms is a potential source of conflict, counteracting the 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 in producing their joint pie.

A substantial fraction of our subjects holds an equality norm and demands an equal share of the pie irrespective of 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 of what they consider to be fair. We explain this 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., they have to commit to a norm to a similar extent. Even though they might agree that, in principle, a specific norm should be followed, "undercutting" is 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 resulting from different normative contents is more prevalent than conflict resulting from different normative commitments.

Our research can be related to the research on group dynamics. Friedkin and Johnsen (1999) propose a dynamic model of emerging consensus or persistent disagreement, in which the opinions of peers in a network can influence each other to a certain extent. Both, opinion dynamics and the content of social norms, can be regarded as a result of a bargaining process. However, there are also some important differences in the two approaches. For one, social norms often go along with material interests, while actors are usually assumed to have shared interests when it comes to opinion dynamics. Furthermore, while Friedkin and Johnsen chose a dynamic approach, our study can be regarded as a static investigation of the final stage of conflict. More research on the dynamic component of normative conflict could help to close this gap and promote a better understanding of the evolution of normative content.

In a more general context, the "cultural diversity" of social norms is remarkably ambivalent. On the one hand, the plurality of social norms can be enriching, refreshing and help society to adjust to different situations and changing conditions. The recognition of alternatives to habits and behavioral standards we take for granted opens our eyes to the arbitrariness of certain norms and our often non-reflective tendency to follow traditional rules. This heterogeneity of normative behavior affects creativity and innovation in society, stimulating the increase of individual and public welfare. On the

other hand, cultural diversity may also endanger cooperation and social order even if all members of society adhere to normative expectations. The coexistence of distinct norms may generate conflict despite cooperative intentions, which may, in turn, lead to an evolutionary process in the emergence of normative content. The constant struggle in society for the power to define the validity of norms is often accompanied with hypocritical rhetoric to convince the disadvantaged to adhere to norms that promise great benefits. In view of the complexity of these social conflicts and cleavages, future research will need to address the relations between material interests, the internalization of norms and selfish behavior. Do actors with higher incomes tend to pursue equity norms, and do actors with more power promote norms that preserve existing power structures? We need laboratory studies to test the theoretical relations on the micro-level and surveys to evaluate the social structure of normative conflict. We believe that our new perspective on normative conflict is a fruitful tool to uncover the double edge of social norms in promoting cooperation on one side but conflict on the other.

Notes

1. For a discussion of different definitions of social norms, see Opp (2001) and Elster (1989); for a current review on social norms, see Rauhut and Krumpal (2008); for literature on the punishment aspect, see Yamagishi (1986) and Heckathorn (1989); and for a microscopic foundation of coordination norms, see Helbing (1992) and also Young (1993).
2. Status value theory (Berger et al. 1972) defines 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 our study investigates people's reactions toward unfairness. Of course, this has consequences for the concept of norms. While status value theory asks "what is normal," we ask how one should be treated compared to an interaction partner.
3. There are a number of models of normative (or fair) behavior, e.g., Fehr and Schmidt (1999); Bolton and Ockenfels (2000); Rabin (1993); Dufwenberg and Kirchsteiger (2004); Falk and Fischbacher (2006); Frohlich et al. (2004).
4. The model is more complex in its general form and accounts for a variety of games. We refer to Chapter 1 of Bicchieri's book for a more general discussion.
5. The way we model utility has been disputed. For a discussion, see Binmore and Shaked (2010); Fehr and Schmidt (2010); Eckel and Gintis (2010).
6. For a related formulation of a utility function, see Frohlich et al. (2004).
7. Relaxing the assumption of common knowledge does not qualitatively change the results.
8. To keep the model tractable, we exclude the case where subjects feel guilt about being better off than their norm prescribes. However, the qualitative results of the analysis do not change when allowing for guilt.
9. Available at: *http://de.wikipedia.org/wiki/PalaceofWestminster.*
10. For example, Rauhut (2009) implemented a general knowledge quiz without the opportunity to prepare for it beforehand.

11. Put more technically, consider the offers and acceptance thresholds as a function of the responder's relative effort

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

Where b_1 is the population intercept, z_{1j} and z_{2j} are idiosyncratic error terms following the distribution $z_{1j} : N(0,C)$, x_{ij} is the relative effort of the responder, and ε_{ij} is an independent measurement error. The fixed-effects part estimates b_1 and b_2, the random effects part estimates C for z_{1j} and z_{2j}. For introductions to multilevel analysis, see Snijders and Bosker (1999) and Rabe-Hesketh and Skrondal (2005).

12. For empirical literature on typical ultimatum game outcomes without the consideration of efforts, see Roth 1995; Cameron 1999; Hoffman et al. 1996; Oosterbeek et al. 2004; Güth et al. 2007.

13. The other types are too rare for an analysis of conflict: we identify 3 proposers and 3 responders as cherry picker types, and 3 proposers and 18 responders as egoistic types.

14. We excluded one case as an influential outlier because this subject contributed zero to the pool and showed extreme behavior by offering everything as proposer and demanding everything as responder.

15. 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 returned qualitatively similar and statistically significant results.

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Supplementary Material

Supplementary material is available at *Social Forces* online, www.sf.oxfordjournals.org.

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Appendix A

A.1 Proof of Proposition 1

Suppose $N_p = N_r = 1/2$ and $x = N_r$, which gives $k_r \max[N_r - x, 0] = 0$ for the responder, meaning that the responder is not discounting her utility. Consequently, her utility is non-negative for any $x \geq 0$ so that she will accept. The reverse is also true for the proposer: $k_p \max[N_p - (1 - x), 0]$ is equal to zero so that her overall utility of offering $x = 1/2$ is non-negative for non-negative pie sizes and greater than the utility of rejection for positive pie sizes.

Assume now $N_p = N_r = 1/2$ and $x > N_r$. Then $k_r \max[N_r - x, 0]$ is equal to zero and $U_r = x - k_r \max[N_r - x, 0]$ is increasing with x and strictly positive for positive pie sizes, which leads to the responder's acceptance. The proposer, however, discounts her utility due to $k_p \max[N_p - (1-x), 0] > 0$ so that the utility is decreasing in x and becomes even lower than the utility of rejection if k_p is large enough. As we have shown, it is not necessary for the proposer to offer $x > 1/2$ as $x = 1/2$ will be accepted and gives greater utility to the proposer than offering $x > 1/2$. Consequently, the proposer will never offer $x > N_r$.

Finally, consider that $N_p = N_r = 1/2$ and $x < N_r$. Then, the responder's discount term $k_r \max[N_r - x, 0] > 0$ can become greater than x for $k_r > 1$ which would lead to rejection as $U_r = x - k_r \max[N_r - x, 0]$ is lower than the utility of 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 $t^* \leq N_r = N_p = 1/2$, 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 $t^* = 1/2$, which will be accepted by the responder.

The same argument holds for the case of equity norms given by $N_p = e_p$, $N_r = (1 - e_p)$.

Thus, if the same 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.

A.2 Proof of Proposition 2

Recall that a proposer offers $x \geq t^*$ if $U_{p,accept} > U_{p,reject} = 0$.

We first analyze the case of a high-contributing equity proposer ($e_p > 1/2$ and $N_p = e_p$ with $k_p > 1$) and a low-contributing equality responder $\left(1 - e_p < 1/2 \text{ and } N_r = 1/2 \text{ with } k_r > 2 / (k_p - 1)\right)$

Case 1: According to his norm, the responder claims at least the threshold $t^* = (k_r / (2 + 2k_r)) \leq 1/2$. The proposer only offers at least this threshold if the

utility of the proposer's share of the pie is higher than her indifference point of a rejected offer, which returns a utility of zero. We can plug the responder's threshold into the proposer's utility function, and by rearranging the formula, we obtain the critical threshold in relative effort U beyond which conflict is inevitable:

$$1 - \frac{k_r}{2 + 2k_r} - k_p\left(e_p - \left(1 - \frac{k_r}{2 + 2k_r}\right)\right) \geq 0$$

$$\frac{1}{k_p} - \frac{k_r}{2k_p + 2k_pk_r} \geq \left(e_p + \frac{k_r}{2 + 2k_r} - 1\right)$$

$$\frac{1}{k_p} - \frac{k_r}{2k_p + 2k_pk_r} + \frac{2k_p + 2k_pk_r}{2k_p + 2k_pk_r} - \frac{k_r}{2 + 2k_r} \geq e_p$$

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

If the proposers effort $e_p > \mathrm{U}$, the utility from offering t^* is below zero (which is the utility of rejection). Hence, it is in these cases a (degenerated) subgame perfect equilibrium to offer any $x < t^*$, leading to rejection.

We now treat the case of a low-contributing equality proposer ($e_p < 1/2$ and $N_p = 1/2$ with $k_p > 1$) and a high-contributing equity responder ($1 - e_p > 1/2$ and $N_r = (1 - e_p)$ with $k_r > 2 / (k_p - 1)$).

Case 2: Now the responder claims at least $k_r(1 - e_p) / 1 + k_r$, which the proposer is willing to offer only if the utility of the proposer's share is higher than zero. Plugging the responder's point of indifference into the proposers utility function yields, in this case, a threshold U of

$$1 - \frac{k_r(1 - e_p)}{1 + k_r} - k_p\left(1 / 2 - (1 - \frac{k_re_p}{1 + k_r})\right) \geq 0$$

$$\frac{2 + 2k_re_p - k_pk_r + k_p + 2k_rk_pe_p}{2(1 + k_r)} \geq 0$$

$$k_pk_r - k_p - 2 \leq e_p(2k_r + 2k_rk_p)$$

$$\frac{k_pk_r - k_p - 2}{2k_r + 2k_pk_r} \leq e_p := \theta$$

If the proposers effort $e_p > U$, the utility from offering t^* is below zero (which is the utility of rejection). Hence, it is in these cases a (degenerated) subgame perfect equilibrium to offer any $x < t^*$, leading to rejection.

Appendix B

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 estimate two ordinary OLS regressions for each subject separately. The first univariate regression estimates the effect of each additional unit of relative effort on the proposer's offer (**slope**) and an intercept which corresponds to the proposer's offer for the case that the responder contributes nothing (**intercept**). A second, bivariate regression estimates the quadratic slope between effort and offer, adding the responders' squared effort as an independent variable (**effort²**). A negative slope for effort² characterizes cherry picker proposers, a positive slope of effort² cherry picker responders. Thus, all players can be categorized by the values of their slope, intercept and effort².

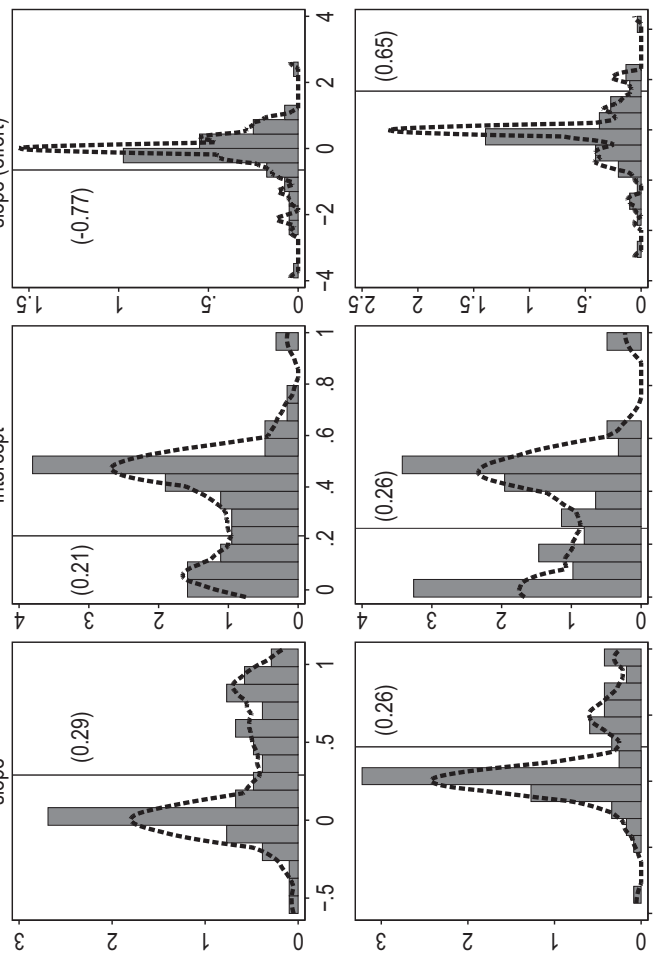

Figure B.1. Kernel Density Estimations and Histograms of the Distribution of the Individual Regression Parameters Defining the Critical Values

Note: 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 is determined using the same OLS regression and adding the squared effort as independent variable. The critical values are given in brackets 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. The vertical lines describe the respective critical values.

In the next step, we define critical values to assign the subjects to distinct types. We estimate Epanechnikov kernel densities for the distribution of slope, intercept and effort^2 among all subjects. 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 shape of the distributions and the critical values are given in figure B.1. 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 for the responder and one standard deviation below zero 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 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".