





Moral preferences in ultimatum and impunity games

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ARTICLE INFO

JEL classification:

C91
D03
D60
D81

Keywords:

Ultimatum game
Impunity game
Moral preferences
Moral foundations theory
Individualizing dimensions
Binding dimensions
Moral suasion

ABSTRACT

We report on two experiments (total N = 2572) testing the role of moral preferences in one-shot, anonymous ultimatum and impunity games, which vary the veto power of responders. In the impunity game, if an offer is lower than the responder's minimum acceptable offer, the proposer still receives his share, while the responder gets nothing. Study 1 is correlational and explores how moral preferences, as measured using the Moral Foundations Questionnaire, explain behaviour in the two games. Study 2 is causal and investigates the effect of moral suasion on behaviour. Regarding proposers, both studies provide evidence that moral preferences affect offers more in the impunity game than in the ultimatum game. For responders, Study 1 shows that moral preferences explain behaviour similarly in both games, while Study 2 demonstrates that moral suasion influences behaviour more strongly in the impunity game. Exploratory analyses of the binding and individualizing dimensions help reconcile these results. Our findings shed light on the complex relationship between moral preferences and behaviour in ultimatum and impunity games.

1. Introduction

"I am gonna make him an offer he cannot refuse".

[The Godfather, 1972.]

In this article, we study the role of morality in the ultimatum game (Güth et al., 1982) and the impunity game (Bolton & Zwick, 1995).

In our version of the ultimatum game, the proposer makes an offer about how to divide a sum of money between himself and the responder, who is asked to determine her minimum acceptable offer (MAO). If the proposer's offer is higher than or equal to the responder's MAO, then the money is divided according to the proposer's offer; otherwise, no one gets any money. The impunity game is similar to the ultimatum game, but with one key difference: if the proposer's offer is lower than the responder's MAO, the proposer still gets his share, while the responder gets nothing. The ultimatum and the impunity games therefore differ in the veto power of the responder. While the responder has full veto power in the ultimatum game, her choice is only self-damaging in the impunity game. Indeed, the responder's decision is not communicated to the proposer, thus the responder cannot punish the proposer, not even symbolically. Yet responders can

express their disagreement with an offer by rejecting it. In other words, the impunity game is obtained from the ultimatum game by removing all the strategic components.

Despite the difference in the veto power of responders, the equilibrium analyses are very simple and lead to the same prediction in both games, at least if one assumes that both the proposer and the responder are motivated by material self-interest, and that this is common knowledge. A materially self-interested responder would accept any non-zero offer. Anticipating this behaviour, a materially self-interested proposer will offer the smallest positive amount possible.

Yet, these predictions are blatantly violated in laboratory experiments. In the ultimatum game, MAOs are typically higher than 25% of the total sum of money, and the vast majority of offers lie between 30% and 50% (Camerer, 2011; Camerer & Thaler, 1995; Fehr & Fischbacher, 2003; Fehr & Schmidt, 1999; Güth & Kocher, 2014; Güth et al., 1982; Henrich et al., 2001). In the impunity game, offers and MAOs are typically lower than those in the ultimatum game, but still well above the equilibrium predictions (Casal et al., 2012; Doñate-Buendía et al., 2023; Güth & Huck, 1997; Yamagishi et al., 2009).

Generations of social scientists have sought to understand these deviations from material self-interest in the ultimatum and impunity games. In this article, we add to this line of work by studying whether

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behaviour in these games can partly be explained by moral preferences for following one's own personal norms.

Personal norms are internal standards about what is right or wrong in a given situation (Schwartz, 1977). The idea corresponds to personal normative beliefs in Bicchieri (2005). The current work builds on the growing body of literature suggesting that moral preferences play a role in dictator games, deception games, trust games, and social dilemmas such as the prisoner's dilemma and the public goods game (see Capraro and Perc (2021) and Capraro et al. (2024) for two recent reviews). Yet, little is known about whether moral preferences play any specific role in ultimatum and impunity games. The closest papers we are aware of are by Eriksson et al. (2017) and Casal et al. (2019). Eriksson et al. (2017) found that moral labels affect the behaviour of responders in the ultimatum game and their judgments about what is morally right. They interpret these findings as evidence that personal norms influence the decisions of ultimatum game responders. Casal et al. (2019) reported an experiment where ultimatum game proposers can increase their size of the pie at the expense of an NGO before making their offer. The authors find that responders are more willing to reject unfair offers if informed that proposers took money from the NGO. Casal et al. (2019) interpret this finding as evidence that responders are not willing to engage in immoral transactions.

Understanding the role of moral preferences in ultimatum and impunity games is important for at least two reasons. First, the ultimatum and impunity games may be fundamentally different from the games that have been studied in previous literature on moral preferences. In fact, Peysakhovich et al. (2014) and Chapman et al. (2023) find that responders' MAOs in the ultimatum game do not correlate strongly with prosocial decisions in the dictator game, trust game, and social dilemmas. Second, there are reasons to believe that moral preferences play a role in bargaining games (Casal et al., 2019; Eriksson et al., 2017; Juan-Bartrolí & Karagözoğlu, 2024). By comparing the ultimatum and impunity games we can assess how removing strategic components influences behaviour. This is particularly relevant because the games capture distinct power dynamics that can be identified in real bargaining situations; e.g., labor negotiations often resemble the impunity game, where employers retain control regardless of employees' rejection, while collective bargaining or legal disputes align more closely with the ultimatum game.

In the next subsections, we review previous works aimed at explaining the behaviour of proposers and responders in ultimatum and impunity games, and we use them to derive our pre-registered hypotheses.

1.1. Explaining proposers' behaviour in ultimatum and impunity games

The fact that offers in the ultimatum game tend to be higher than offers in the impunity game suggests that material self-interest does play a role in determining the behaviour of proposers in the ultimatum game: if proposers believe that low offers will be rejected, then it is in their material self-interest to make high offers. However, offers are often higher than those that would maximize the material payoff, even when accounting for expected minimum acceptable offers (Henrich et al., 2001; Lin & Sunder, 2002). This indicates that motivations beyond material self-interest must also be influencing decisions. Thus, proposers' behaviour in the ultimatum game could be explained by a combination of material self-interest and preferences beyond material self-interest.

In our impunity game, strategic motivations for making high offers are ruled out because rejections do not materially or emotionally harm the proposer, as rejections are never communicated to the proposer. Consequently, the proposer's decision in the impunity game is strategically equivalent to the dictator's decision in the dictator game, where one player (the dictator) decides how to divide a sum of money between himself and a second player (the receiver), which has no active role. Given that the receiver has no influence over the outcome, a materially

self-interested dictator would give nothing; hence, any positive giving must be driven by preferences beyond material self-interest. Therefore, like in the dictator game, offers in the impunity game are driven *solely* by preferences beyond material self-interest. This suggests a greater role for these preferences in the impunity game compared to the ultimatum game.

In general, preferences beyond self-interest are not only influenced by personal norms. For example, Bašić and Verrina (2020) highlight that injunctive norms, beliefs about what others approve or disapprove of, play a role beyond personal norms and self-interest in some economic games, including the dictator game. However, since in the impunity game the responder cannot affect the proposer, it seems likely that the share of preferences beyond self-interest explained by personal norms in the impunity game is greater than in the ultimatum game, where the proposer can be punished and thus may be more concerned about the approval or disapproval of others, particularly the responder. This consideration leads to our first, pre-registered, hypothesis.

H1. *Moral preferences for following one's own personal norms explain the behaviour of proposers (i.e., offers) in the impunity game to a greater extent than in the ultimatum game.*

1.2. Explaining responders' behaviour in ultimatum and impunity games

To determine whether moral preferences may influence the behaviour of responders and whether this influence is more pronounced in one game over the other, we note that in the ultimatum game, responders may reject low offers based on moral motivations, such as equity considerations. However, there are also other reasons to reject unfair offers. Specifically, experimental studies have identified a subset of subjects who reject unfair offers in the ultimatum game out of spite – a desire to be better off than the proposer (Brañas-Garza et al., 2014; Espín et al., 2015; Rotemberg, 2008; Yamagishi et al., 2012, 2017). Spitefulness has been linked to aggression, a lack of guilt, and dark personality traits (Marcus et al., 2014). This suggests that the presence of spiteful subjects may diminish the overall role of moral preferences in influencing MAOs in the ultimatum game.

In contrast, in the impunity game, responders have no means to affect the proposer, not even symbolically; hence, a materially self-interested (or spiteful) responder would accept any non-zero offer. This indicates that moral preferences might play a more significant role in shaping responders' behaviour in the impunity game compared to the ultimatum game.

H2. *Moral preferences for following one's own personal norms explain the behaviour of responders (i.e., MAOs) in the impunity game to a greater extent than in the ultimatum game.*

1.3. Our contribution

In this paper we test hypotheses H1 and H2 through two studies. The first study examines the correlation between choices in the impunity and ultimatum game and two measures of moral preferences. The second study extends beyond simple correlations by examining whether moral suasion impacts decisions in the ultimatum and impunity games.

2. Study 1

2.1. Method

2.1.1. Participants

We aim to collect a total of $N = 1600$ participants. Recruitment takes place online via Amazon's Mechanical Turk (AMT). Eligibility is limited to those located in the USA with a HIT Approval Rate greater than 90%. The hypotheses, design, sampling, analysis and exclusion criteria are pre-registered at: <https://aspredicted.org/blind.php?x=ac39nu>.

2.1.2. Ultimatum and impunity games

In each of these games, a participant in the role of the proposer starts with 10 cents and decides how much to offer to another participant, the responder, who sets the minimum acceptable offer (MAO). If the MAO is less than or equal to the proposer's offer, the money is split accordingly. The ultimatum and impunity games differ when the proposer's offer falls below the MAO: in the ultimatum game (UG), neither participant receives anything, while in the impunity game (IG), the proposer retains the unoffered portion, and the responder receives nothing.

We focus on the private impunity game, where the responder's MAO is not disclosed to the proposer. This eliminates strategic motivations: the responder cannot materially or emotionally punish the proposer. The use of the strategy method further reduces the role of emotions, which can explain rejections (Aina et al., 2020).

2.1.3. Measures of moral preferences

Our experimental design incorporates two measures of moral preferences: the Moral Foundations Questionnaire (MFQ) in Graham et al. (2009) and the Trade-Off Game (TOG) in Capraro and Rand (2018).

The MFQ is a self-reported questionnaire with two sections. The first part asks participants to rate how relevant various considerations are in their moral judgments on a scale from 0 (not at all relevant) to 5 (extremely relevant), e.g., "Whether or not someone cared for someone weak or vulnerable", "Whether or not someone did something to betray his or her group"... The second part requires participants to express their agreement with moral statements on a scale from 0 (strongly disagree) to 5 (strongly agree), e.g., "People should not do things that are disgusting, even if no one is harmed", "People should be loyal to their family members, even when they have done something wrong"... The questionnaire allows us to decompose participants' moral preferences into five 'foundations':

- Care: Linked to empathy and compassion.
- Fairness: Associated with justice and reciprocal behaviours.
- Ingroup: Tied to group loyalty and self-sacrifice.
- Authority: Connected to obedience and leadership.
- Purity: Concerned with chastity and control of desires.

Therefore, this questionnaire does not specifically measure personal norms related to the decision-making context (i.e., personal normative beliefs for different actions in the ultimatum and impunity games); instead, by explicitly asking participants about their personal normative beliefs in different situations, it captures their personal norms in various morally-relevant topics that cover a broad range of moral attitudes (Atari et al., 2023; Graham et al., 2009). This approach enables us to understand how personal norms in these broader topics can explain behaviour in both the ultimatum and impunity games. We use the term "personal norms" because the MFQ directly taps into individual beliefs about the right or wrong course of action, which aligns with the concept of "personal norms" (Schwartz, 1977). We acknowledge that personal norms may be linked to social norms. However, it is not the aim of this project to disentangle personal norms from social norms.

As pre-registered, we use the overall MFQ score as a general measure of the strength of moral preferences. We then separate the five dimensions for detailed explanatory analysis. As an additional exploratory analysis, we examine the role of the individualizing dimensions (care and fairness) and the binding dimensions (ingroup, authority, and purity), following research linking these dimensions to consequentialist and deontological moral judgments (Piazza & Sousa, 2014; Russell & Giner-Sorolla, 2011; Wheeler & Laham, 2016). Consequentialism posits that the morality of an action is determined by its consequences (Bentham, 1970; Mill, 2016), while deontology argues that the morality of an action is determined by whether it adheres to established rules, principles, or moral norms (Kant, 1873). This exploration helps us understand which structure of moral reasoning

– consequentialist or deontological – better explains the behaviour observed in the ultimatum and impunity games.

Our second pre-registered measure for moral preferences is the TOG. In this game, participants are matched with other two participants and choose (as dictators) between two options. The "equal" option allocates \$13 cents to each participant, while the "efficient" option gives \$23 cents to one participant (not the dictator) and \$13 cents to the other two. The TOG is presented in one of two frames:

- **TOG Generous frame.** The efficient choice is labelled "be generous", while the equal choice is labelled "be ungenerous".
- **TOG Fair frame.** The equal choice is labelled "be fair", while the efficient choice is labelled "be unfair".

Economically, the TOG Generous frame is equivalent to the TOG Fair frame. However, the framing significantly influences participants' moral judgments and behaviour. The framing in the TOG is designed to elicit an experimenter demand effect, providing "cues about what constitutes appropriate behaviour" (Zizzo, 2010). These cues impact perceptions of the morally correct action and behaviour. Specifically, studies have shown that most people perceive the efficient choice in the TOG Generous frame and the equal choice in the TOG Fair frame as the morally right options (Capraro & Rand, 2018) and behave accordingly (Capraro et al., 2020; Huang et al., 2019; Tappin & Capraro, 2018). This suggests that the choice aligning with the frame can serve as an individual measure of moral preferences.

A potential critique of this measure is that it might conflate personal norms with social desirability: participants may choose the option congruent with the frame simply to appear morally upright. However, one study indicates that framing effects in the TOG remain consistent regardless of whether choices are public or private, suggesting that these effects reflect internalized preferences rather than social desirability concerns (Capraro et al., 2021).

Given this potential criticism, our primary focus will be on the MFQ. For completeness, the TOG analysis is detailed in Online Appendix C. Importantly, the findings from the TOG qualitatively align with those from the MFQ. We find that, among proposers, TOG moral choices correlate with offers in the impunity game, but not in the ultimatum game. Conversely, among responders, TOG moral choices correlate with MAOs in both games to a similar extent.

2.1.4. Demographics and risk-aversion

At the conclusion of the experiment, we collect demographic information (age and gender), and we elicit risk aversion using a hypothetical scenario adapted from (Gneezy & Potters, 1997). Participants are asked to imagine they have \$10 to invest in a risky asset. The amount invested (x) either yields a return of $7x$ or is lost, depending on the outcome of a die roll -the investment is successful if number 1 is obtained after rolling the die; i.e., there is a probability $1/6$ of success. Given the positive expected value of the investment, risk-neutral or risk-loving participants should invest the entire \$10, while risk-averse individuals are likely to invest less. The amount not invested serves as an indicator of risk aversion. These variables (age, gender, and risk aversion) are used as controls in our econometric analysis.

2.1.5. Procedures

Participants are randomly assigned to one of eight conditions, based on the type of bargaining game (UG/IG), the frame of the TOG (Generous/Fair), and the order of decisions in the bargaining game (whether they play first as proposers or responders). Hence, participants in the condition denoted $X_j - Y - X_k$ first play one of the bargaining games $X \in \{UG, IG\}$ in the role of proposer ($j = 1$) or responder ($j = 2$). Subsequently, they participate in the TOG in the $Y \in \{\text{Generous frame, Fair frame}\}$. Finally, they return to the same bargaining game $X \in \{UG, IG\}$, but switch roles ($k \in \{1, 2\}, k \neq j$). At the beginning of each game, participants are informed that they are paired with brand new

Table 1
Summary of the behaviour in the ultimatum and the impunity games.

	Proposer (Offer)		Responder (MAO)	
	Ultimatum	Impunity	Ultimatum	Impunity
Average offer/MAO	4.82	3.81	3.96	3.08
Standard deviation	0.99	2.04	1.51	2.01
Min/Max offer/MAO	0/10	0/10	0/10	0/10
Frequency of equal offer/MAO	0.84	0.61	0.49	0.32
<i>N</i>	819	723	819	723

participants, different from those with whom they were paired in the previous games. In all cases, the MFQ is administrated at the end of the session so as to prevent that responses in the questionnaire influence behaviour in the bargaining games (Krupka & Weber, 2009). Detailed experimental instructions can be found in Online Appendix A.

2.1.6. Comprehension and payments

Upon reading the instructions, participants answer three comprehension questions designed to ensure their understanding of the bargaining game $X \in \{UG, IG\}$. Only those who correctly answer all comprehension questions are awarded the participation fee of \$0.50 and permitted to proceed in the experiment. This procedure helps ensure high data quality on AMT (Chmielewski & Kucker, 2020), making it comparable to data from laboratory settings (Arechar et al., 2018; Brañas-Garza et al., 2018; Paolacci et al., 2010).

At the end of the experiment, participants receive a completion code to submit their responses to AMT. Each participant earns an additional bonus based on their decisions in either the bargaining game or the TOG, with the specific game used for bonus determination being randomly selected. When receiving their bonus payment, participants are informed only of their earnings, not of the decision selected for payment or the decision made by the other players.

The experiment lasted around 7 min and participants earned roughly 65 cents. This translates to an hourly wage of roughly \$5.60, which is above the mean hourly wage per worker on AMT (Hara et al., 2019).

2.2. Results

Following our preregistered protocol, we exclude from the analysis participants who did not answer all the comprehension questions correctly as well as duplicate responses according to participants' IP address and unique Mechanical Turk ID. This leaves us with a total of $N = 1542$ participants, with $N = 819$ participating in the ultimatum game and $N = 723$ participating in the impunity game.

2.2.1. Order effects

Participants played both as proposers and responders in each game, in random order. Following our pre-registered analysis plan, we begin by testing for order effects using an OLS model. However, we find little and inconsistent evidence of order effects (see Online Appendix B). Consequently, in the subsequent analysis, we pooled the data together.

2.2.2. Summary of data

We summarize the behaviour of proposers and responders in Table 1. This presents the average offer of proposers and the average MAO of responders in each game, along with the frequency of equal offers and equal MAOs, indicating participants offering or demanding half of the endowment.

In our versions of the ultimatum and the impunity games the money to be divided is assigned to the proposer rather than being "on the table". While this framing could potentially lead to lower offers – e.g., if proposers feel more entitled to keep their initial endowment – we find that the overall distribution of offers is very similar to what has been observed in previous literature (Güth & Kocher, 2014). As

expected, proposers offer significantly more in the ultimatum than in the impunity game (two-sample Wilcoxon rank-sum: $z = 10.62, p < 0.001$). Similarly, responders demand more in the ultimatum than in the impunity game ($z = 9.27, p < 0.001$). These findings are consistent with previous research comparing behaviour in ultimatum and impunity games, which has shown similar patterns (Güth & Huck, 1997; Yamagishi et al., 2009). A within-subject analysis using the Wilcoxon signed-rank test also reveals that participants offer more as proposers compared to their demands as responders in both the ultimatum ($z = 15.89, p < 0.001$) and the impunity game ($z = 8.04, p < 0.001$).

Our main focus is to assess the correlation between moral preferences and behaviour in the ultimatum and the impunity games. In the following subsections, we concentrate on examining the predictive power of MFQ scores on proposers' offers and responders' MAOs in each game.

2.2.3. Econometric analysis for proposers

Following our pre-registered analysis plan, we investigate the role of moral preferences on proposers' offers using OLS models. The dependent variable in our analysis is the amount that proposers offer to responders. We initially examine a basic model predicting proposers' behaviour as a function of the overall MFQ score (see Table 2). Subsequently, we conduct a more detailed explanatory analysis, where the MFQ score is disaggregated into its five dimensions (see Table 3). Finally, our estimates in Table 4 correspond to our non pre-registered analysis of the individualizing and binding dimensions. Each table includes column (a) presenting results with interactions between the moral variables and a dummy variable for the ultimatum game. We then remove the interaction terms and test for the effects of moral variables separately in the ultimatum game and the impunity game in columns (b) and (c). In Online Appendix D, we provide the analysis with added controls on gender, age, and risk, which we pre-registered as robustness checks. All results presented in this section remain robust to the inclusion of these controls.

Our estimates in Table 2 indicate that the MFQ score is positively associated with proposers' offers in the impunity game ($b = 0.449, p < 0.001$; see column (c)), whereas we find no evidence that the MFQ score is associated with offers in the ultimatum game ($b = 0.019, p = 0.730$; see column (b)). The negative and significant interaction term MFQ Score * UG is negative in column (a) suggests that, consistent with hypothesis H1, moral preferences explain proposers' offers in the impunity game to a greater extent than they do in the ultimatum game. In fact, testing the null hypothesis that the MFQ score has the same effect in the ultimatum and the impunity game leads to rejection at any common significance level ($F = 12.02, p < 0.001$).

Table 3 examines which moral foundations explain the behaviour of proposers. The care dimension is positively associated with offers in the impunity game ($b = 0.429, p < 0.001$; see column (c)), but not in the ultimatum game ($b = 0.028, p = 0.595$; see column (b)). The significant interaction term Care * UG ($b = -0.401, p = 0.001$; see in column (a)) indicates that the role of the care dimension differs between the ultimatum and the impunity games. The authority dimension appears to be relevant in the ultimatum game ($b = -0.189, p < 0.003$; see column (b)), but not in the impunity game ($b = -0.130, p = 0.328$; see column (c)). However, the non-significant interaction term Authority * UG ($b = -0.060, p = 0.673$; see in column (a)), suggests that the role of the authority dimension is similar across both games.

Our estimates in Table 4 reveal that both the individualizing and (to a lesser extent) the binding dimensions significantly predict offers in the impunity game (in column (a), the individualizing: $b = 0.422, p < 0.001$; binding: $b = 0.152, p = 0.014$; in column (c) the individualizing: $b = 0.422, p < 0.001$; binding: $b = 0.152, p = 0.057$). However, when examining their effects on the ultimatum game, we do not find evidence that these dimensions are statistically significant (in column (a), individualizing: $b = 0.091, p = 0.218$; binding: $b = -0.028, p = 0.648$; in column (b) individualizing: $b = 0.091, p = 0.053$; binding:

Table 2
Behaviour of proposers: offers and MFQ score.

	MFQ Score		
	(a) Pooled	(b) UG	(c) IG
Constant	2.076*** (0.345)	4.752*** (0.217)	2.076*** (0.446)
Ultimatum Game (UG)	2.675*** (0.485)		
MFQ Score	0.449*** (0.088)	0.019 (0.055)	0.449*** (0.114)
MFQ Score * UG	-0.430*** (0.124)		
Observations	1,542	819	723
R-squared	0.109	0.000	0.021

Standard errors in parentheses
*** p<0.001, ** p<0.01, * p<0.05

Table 3
Behaviour of proposers: offers and the five dimensions of the MFQ.

	MFQ Five Dimensions		
	(a) Pooled	(b) UG	(c) IG
Constant	1.781*** (0.423)	4.639*** (0.258)	1.781*** (0.548)
Ultimatum Game (UG)	2.857*** (0.587)		
Care	0.429*** (0.085)	0.028 (0.052)	0.429*** (0.110)
Fairness	-0.060 (0.096)	0.059 (0.056)	-0.060 (0.125)
In-group	0.214* (0.088)	0.094 (0.055)	0.214 (0.114)
Authority	-0.130 (0.102)	-0.189** (0.063)	-0.130 (0.133)
Purity	0.042 (0.067)	0.050 (0.039)	0.042 (0.087)
Care * UG	-0.401*** (0.118)		
Fairness * UG	0.119 (0.131)		
In-group * UG	-0.120 (0.123)		
Authority * UG	-0.060 (0.142)		
Purity * UG	0.008 (0.091)		
Observations	1,542	819	723
R-squared	0.127	0.016	0.043

Standard errors in parentheses
*** p<0.001, ** p<0.01, * p<0.05

$b = -0.028, p = 0.473$). The significant interaction terms in column (a) Individualizing * UG ($b = -0.331, p = 0.002$) and Binding * UG ($b = -0.179, p = 0.038$) indicate that the roles of individualizing and binding dimensions in determining proposers' behaviour differ between the ultimatum and the impunity game.

2.2.4. Econometric analysis for responders

In accordance with our pre-registered analysis plan, we report estimates from OLS models that predict MAOs.

Table 5 shows that MFQ scores are positively associated with MAOs in both the impunity game ($b = 0.236, p = 0.036$; column (c)) and the ultimatum game ($b = 0.200, p = 0.018$; column (b)). However, the non-significant interaction term, MFQ score * UG ($b = -0.037, p = 0.791$; column (a)), indicates that we cannot reject the hypothesis that moral preferences similarly influence responders' MAOs in both games. Consequently, these results do not fully support Hypothesis H2, which proposed that moral preferences have a more pronounced effect

in the impunity game than in the ultimatum game. Rather, the findings suggest that moral preferences consistently affect MAOs across both games.

To gain a more detailed understanding of how moral preferences influence MAOs, we disaggregate the MFQ score into its five dimensions, as shown in Table 6. This analysis reveals that no specific dimension of morality, except for the ingroup dimension, significantly drives the effect of moral preferences on MAOs. The ingroup dimension is statistically significant in the impunity game ($b = 0.236, p = 0.036$; column (c)), but not in the ultimatum game ($b = 0.123, p = 0.141$; column (b)). However, the non-significant interaction term, Ingroup * UG ($b = -0.113, p = 0.414$; column (a)), indicates that we cannot reject the hypothesis that the influence of the ingroup dimension is similar across both games.

Lastly, we explore the role of the individualizing and binding dimensions in influencing responders' MAOs. Table 7 shows that these dimensions are associated with MAOs in fundamentally different ways.

Table 4
Behaviour of proposers: offers and individualizing/binding dimension.

	MFQ Individualizing - Binding		
	(a) Pooled	(b) UG	(c) IG
Constant	1.368*** (0.394)	4.496*** (0.251)	1.368*** (0.510)
Ultimatum Game (UG)	3.129*** (0.557)		
Individualizing	0.422*** (0.075)	0.091 (0.047)	0.422*** (0.097)
Binding	0.152* (0.062)	-0.028 (0.038)	0.152 (0.080)
Individualizing * UG	-0.331** (0.105)		
Binding * UG	-0.179* (0.086)		
Observations	1,542	819	723
R-squared	0.118	0.005	0.032

Standard errors in parentheses
*** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$

Table 5
Behaviour of responders: MAOs and MFQ score.

	MFQ Score		
	(a) Pooled	(b) UG	(c) IG
Constant	2.168*** (0.387)	3.188*** (0.328)	2.168*** (0.442)
Ultimatum Game (UG)	1.020 (0.545)		
MFQ Score	0.236** (0.099)	0.200* (0.084)	0.236* (0.113)
MFQ Score * UG	-0.037 (0.139)		
Observations	1,542	819	723
R-squared	0.064	0.007	0.006

Standard errors in parentheses
*** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$

On one hand, the individualizing dimensions are negatively associated with MAOs but interact positively with the UG dummy ($b = 0.280$, $p = 0.018$; column (a)), resulting in these dimensions being negatively associated with MAOs in the impunity game ($b = -0.221$, $p < 0.001$; column (c)) but not in the ultimatum game ($b = 0.059$, $p = 0.409$; column (b)). On the other hand, the binding dimensions are associated with MAOs both in the impunity ($b = 0.295$, $p < 0.001$; column (c)) and in the ultimatum game ($b = 0.129$, $p = 0.027$; column (b)). We therefore conclude that both the individualizing and binding dimensions are relevant in the impunity game (though in opposite directions), while the binding dimensions are more relevant in the ultimatum game. All our findings remain robust when adding controls on gender, age, and risk (see the Online Appendix D).

3. Study 2

Study 1 explored the correlations between moral preferences and behaviour in both the impunity and ultimatum games. Study 2 aims to investigate the causal relationship between morality and behaviour in these games.

3.1. Experimental design and procedures

We recruit a total of $N = 1200$ participants via Prolific (Palan & Schitter, 2018), which provides better data quality than other online platforms (Douglas et al., 2023; Eyal et al., 2021). As in our Study 1,

participants are located in the US and have an approval rate greater than 80%. They receive a fee of £0.50 to engage in a 3 min experiment. Only those who correctly answered all comprehension questions are permitted to advance to the actual experiment, where they make a decision regarding the allocation of £0.10.

We employed a 2 (Baseline, Moral) \times 2 (UG, IG) between-subjects design. The instructions are presented in Appendix E. In the Baseline conditions, participants play one of the two games (UG or IG) both as proposers and responders, in random order. In the Moral treatments, participants are instructed to “please decide according to what you think is morally right”. This type of moral suasion is commonly used in experimental economics (Bilancini et al., 2020; Kuang & Bicchieri, 2024). We opted to target the personal norm specific to the decision at hand, rather than broader personal norms as in Study 1, because targeting broader personal norms would have required at least five experimental conditions, one for each of the moral foundations. Although in future work it could be interesting to target specific moral foundations, we believe that our research question – whether personal norms causally influence behaviour in the ultimatum and impunity games – can be adequately addressed with this simpler design.

The experiment lasted less than 3 min and participants received an hourly wage of roughly £11.25, which is above the fair wage per worker on Prolific. Following our hypotheses, we anticipate that moral suasion increases proposers’ offers and responders’ MAOs in the impunity game to a greater extent than in the ultimatum game.

Table 6
Behaviour of responders: MAOs and the five dimensions of the MFQ.

	MFQ Five Dimensions		
	(a) Pooled	(b) UG	(c) IG
Constant	3.137*** (0.477)	3.373*** (0.394)	3.137*** (0.543)
Ultimatum Game (UG)	0.236 (0.661)		
Care	-0.093 (0.096)	0.047 (0.079)	-0.093 (0.109)
Fairness	-0.140 (0.109)	0.004 (0.086)	-0.140 (0.124)
In-group	0.236** (0.099)	0.123 (0.084)	0.236** (0.113)
Authority	0.007 (0.115)	-0.085 (0.095)	0.007 (0.131)
Purity	0.067 (0.076)	0.078 (0.059)	0.067 (0.086)
Care * UG	0.140 (0.133)		
Fairness * UG	0.144 (0.148)		
In-group * UG	-0.113 (0.139)		
Authority * UG	-0.092 (0.160)		
Purity * UG	0.011 (0.102)		
Observations	1,542	819	723
R-squared	0.077	0.009	0.027

Standard errors in parentheses
*** p<0.001, ** p<0.01, * p<0.05

Table 7
Behaviour of responders: MAOs and individualizing-binding dimensions.

	MFQ Individualizing - Binding		
	(a) Pooled	(b) UG	(c) IG
Constant	3.088*** (0.442)	3.251*** (0.381)	3.088*** (0.503)
Ultimatum Game (UG)	0.163 (0.625)		
Individualizing	-0.221** (0.084)	0.059 (0.072)	-0.221* (0.096)
Binding	0.295*** (0.069)	0.129* (0.058)	0.295*** (0.079)
Individualizing * UG	0.280* (0.118)		
Binding * UG	-0.165 (0.097)		
Observations	1,542	819	723
R-squared	0.075	0.007	0.025

Standard errors in parentheses
*** p<0.001, ** p<0.01, * p<0.05

3.2. Results

3.2.1. Summary of data

Table 8 provide a summary of the behaviour of proposers and responders in each treatment. In the Baseline treatments, as observed in Study 1, proposers (responders) offer (demand) significantly more in the ultimatum game than in the impunity game (Offers: $z = 3.44, p < 0.001$, MAOs: $z = 3.77, p = 0.002$). However, this pattern does not extend to the Moral treatments, where offers and MAOs in the ultimatum game are not significantly different from those in the impunity game (Offers: $z = 0.16, p = 0.875$, MAOs: $z = 1.38, p = 0.167$).

3.2.2. Test of hypothesis H1 and H2

Our pre-registered hypotheses posit that moral preferences have a greater impact on the behaviour of proposers (H1) and responders (H2) in the impunity game than in the ultimatum game. To test these hypotheses, we use OLS models. Table 9 presents the estimates from these models, where the dependent variable is either the amount proposers offer to responders or MAO of responders. Our initial model (a) includes a dummy variable for the impunity game (IG), a dummy for moral suasion, and their interaction. Subsequently, in columns (b) and (c), we assess the effects of moral suasion specifically within the ultimatum and impunity games, respectively.

Table 8
Summary of the behaviour in the ultimatum and the impunity games.

	Baseline treatments		Moral treatments	
	Ultimatum	Impunity	Ultimatum	Impunity
(a) Behaviour of proposers				
Average offer	4.79	4.32	4.95	4.92
Standard deviation	1.20	1.72	0.93	1.54
Min/Max offer	0/10	0/10	0/10	0/10
Frequency of equal offer	0.81	0.66	0.89	0.78
(b) Behaviour of responders				
Average MAO	4.04	3.39	3.97	4.23
Standard deviation	1.80	1.72	1.57	1.87
Min/Max MAO	0/10	0/8	0/10	0/10
Frequency of equal MAO	0.47	0.37	0.50	0.56
N	259	254	262	255

Critically, the interaction term IG \times Moral is positive and statistically significant for both proposers and responders (see columns (a)), indicating a more pronounced effect in the impunity game. Correspondingly, the coefficient of the dummy variable for the Moral treatment is positive and significant in the impunity game (see columns (c)), while it is not significant in the ultimatum game (see columns (b)). Instructing participants to decide according to what they think is morally right increases offers and MAOs in the impunity game (Offers: $p < 0.001$, MAOs: $p < 0.001$), but it does not affect behaviour in the ultimatum game (Offers: $p = 0.092$, MAOs: $p = 0.604$). These results are consistent with Hypothesis H1 and H2.

4. Discussion

We conducted two experiments to examine the role of moral preferences in ultimatum and impunity games.

Regarding proposers, in Study 1, we found that moral preferences, as measured by the Moral Foundations Questionnaire (MFQ), have a more substantial impact in the impunity game than in the ultimatum game, aligning with our preregistered hypothesis H1 (see Table 2). Study 2 corroborated this finding by showing that moral suasion significantly boosts offers in the impunity game more than in the ultimatum game (see Table 9). This evidence suggests that morality can explain the behaviour of proposers in the ultimatum and impunity games, but to a different extent.

Additional analyses indicated a positive correlation between offers in the impunity game and both the individualizing and (to a lesser extent) binding dimensions of the MFQ (see Table 4). This suggests that proposers' decisions in the impunity game are primarily influenced by consequentialist moral considerations, although deontological considerations also play a role. Conversely, the binding dimensions do not predict proposers' behaviour in the ultimatum game, resulting in deontological moral considerations playing a more significant role among proposers in the impunity game than in the ultimatum game.

Regarding responders, Study 1 found that moral preferences explain MAOs in both the ultimatum and the impunity game (see Table 5). This result only partially aligns with our preregistered hypothesis H2, which anticipated a stronger effect in the impunity game. However, Study 2 was fully in line with hypothesis H2, demonstrating that moral suasion increases MAOs more significantly in the impunity game than in the ultimatum game (see Table 9).

The exploratory analysis using the binding and individualizing dimensions helps to reconcile these differing results. We found that while only the binding dimensions explain MAOs in the ultimatum game, both the individualizing and the binding dimensions explain MAOs in the impunity game (see Table 7). Importantly, they do so in opposite directions: the individualizing dimensions are negatively associated with MAOs, whereas the association between the binding dimensions and MAOs is positive. This suggests that consequentialist

moral judgments may contribute to lower MAOs in the impunity game. This relationship might stem from the realization among people scoring high in the individualizing dimensions that rejecting low offers in the impunity game has no consequences on the proposer; i.e., thus, setting high MAOs may seem pointless to these responders. In any case, people higher in the individualizing dimensions who stated lower MAOs in the impunity game might have counterbalanced more spiteful people who declared higher MAOs in the ultimatum game (Brañas-Garza et al., 2014; Espín et al., 2015; Rotemberg, 2008; Yamagishi et al., 2012, 2017), leading to the overall lack of a significant difference in the associations between moral preferences and MAOs across games. In addition, it is worth noting that Study 1 provides a stronger evidence in support of hypothesis H2 if we restrict our attention to the binding dimensions, as the association between the binding dimensions and MAOs is marginally significantly greater in the impunity game than in the ultimatum game (see Table 7). Therefore, we can reconcile the results of Study 1 and Study 2 by assuming that moral suasion primarily taps onto the binding dimensions.

The use of the MFQ allows us to dissect morality into five distinct dimensions. In this regard, our findings suggest an association between the care dimension and offers in the impunity game, the authority dimension with offers in the ultimatum game, and the ingroup dimension with MAOs in the impunity game (see Tables 3 and 6). These results indicate that the relationship between specific moral values and behaviour may be complex and thus deserving further work.

Our results contribute to the emerging literature exploring the role of moral preferences in economic games. Previous work have reported that preferences for following one's own personal norms play a role in various settings, including the dictator game (Bašić & Verrina, 2020; Capraro et al., 2019; Capraro & Rand, 2018; Schier et al., 2016; Tappin & Capraro, 2018), the trade-off game (Capraro et al., 2021; Capraro & Rand, 2018; Huang et al., 2019; Tappin & Capraro, 2018), the trust game (Bonowski & Minnameier, 2022; Clark et al., 2017), and social dilemmas such as the prisoner's dilemma and the public goods game (Catola et al., 2021; Mieth et al., 2021; Biziou-van Pol et al., 2015), while finding minimal impact in the stag-hunt game (Capraro et al., 2020). However, the specific roles of moral preferences in the ultimatum and impunity games had been less explored until now. This represents a clear limitation given that not all behaviour can be explained solely by outcome-based preferences (Capraro et al., 2024) and morality play an important role in bargaining settings (Casal et al., 2019; Eriksson et al., 2017; Juan-Bartroli & Karagözoğlu, 2024).

Like all experimental research, our study has limitations. One concerns the relatively small stakes used. Several experimental works have shown that stakes have little effect on economic games similar to the ones studied in this paper: a recent meta-analysis by Larney et al. (2019) found no stake effects in the ultimatum game and only a small effect in the dictator game. However, we acknowledge this limitation, especially in Study 1, which had a longer duration and resulted in lower average payments compared to Study 2. Another limitation is related to the measure of moral preferences employed in Study 1. Our main measure was the MFQ, which is one of the most used measures of moral preferences in the literature. In the Online Appendix C we have also shown that our results remain qualitatively similar if we use the Trade-Off Game as a measure of moral preferences. But, arguably, these are not the only ones. In particular, in the last years a new framework, named morality-as-cooperation theory, has emerged (Curry et al., 2019). Future work could test how ultimatum and impunity game decisions load on the seven dimensions of the morality-as-cooperation framework. A third limitation concerns the choice of the games. We focused on ultimatum and impunity games. However, there are other games that vary the veto power of responders (Casal et al., 2012; Fellner & Güth, 2003; Güth & Huck, 1997; Rodríguez-Lara, 2016). There are also variants of bargaining games that allow for communication (Zultan, 2012) or commitment (Bolton & Karagözoğlu, 2016).

Table 9
The effect of moral preferences on offers and MAOs.

	Proposers (Offers)			Responders (MAOs)		
	(a) Pooled	(b) UG	(c) IG	(a) Pooled	(b) UG	(c) IG
Constant	4.792*** (0.074)	4.792*** (0.074)	4.319*** (0.108)	4.042*** (0.112)	4.042*** (0.112)	3.390*** (0.108)
Impunity Game (IG)	-0.473*** (0.134)			-0.653*** (0.155)		
Moral treatment	0.159 (0.094)	0.159 (0.094)	0.603*** (0.157)	-0.077 (0.145)	-0.077 (0.148)	0.842*** (0.160)
IG x Moral treatment	0.445* (0.173)			0.918** (0.218)		
Observations	1,030	521	509	1,030	521	509
R-squared	0.033	0.005	0.033	0.031	0.001	0.052

Robust standard errors in parentheses *** p<0.001, ** p<0.01, * p<0.05.

We believe that another promising avenue for future research would be to examine the role of moral preferences in these settings.

Notwithstanding these limitations, our findings suggest that moral preferences can influence behaviour in impunity and ultimatum games. The details of this influence are complex and warrant further scrutiny to be fully understood.

CRedit authorship contribution statement

Valerio Capraro: Writing – review & editing, Writing – original draft, Methodology, Investigation, Funding acquisition, Formal analysis, Data curation, Conceptualization. **Ismael Rodríguez-Lara:** Writing – review & editing, Writing – original draft, Visualization, Validation, Supervision, Software, Methodology, Investigation, Funding acquisition, Formal analysis, Data curation, Conceptualization.

Acknowledgements

This project was financed by the Spanish Ministry of Science, Innovation and Universities under the research projects PGC2018-097875-A-I00, and Grant PID2022-142943NB-I00, funded by MICIU/AEI/ 10.13039/501100011033 and, ERDF/EU. Ismael Rodríguez-Lara acknowledges financial support from Junta de Andalucía under the research projects B-SEJ-206-UGR20 (Proyectos de Investigación UGR-FEDER) and P20_00069 (Junta de Andalucía PAIDI). Funding for open access charge: Universidad de Malaga / CBUA.

Supplementary data

Supplementary material related to this article can be found online at <https://doi.org/10.1016/j.soccc.2025.102371>.

Data availability

Data will be made available on request.

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