Repugnant transactions: The role of agency and extreme consequences*

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Abstract

People can have a preference to restrict transactions that other people want to engage in, e.g., the sale of human organs and prostitution. It is not well understood what causes such judgments of repugnance. We study two potential reasons: lack of agency of the parties and extreme consequences. Using a lab experiment, we ask spectators whether they want to prohibit the transaction or not. We find that transactions with extreme outcomes (listening to a painful tone) are more frequently prohibited than those with mild outcomes (waiting in the lab) and more often when agency is limited than with full agency.

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1 Introduction

Transactions between agents are not only governed by self-interest but also by moral considerations, fairness principles, and social norms. Such motives are evident when people sacrifice their own utility in favor of the welfare of others. However, fairness views and social norms can also matter for judgments about transactions that only involve others. People feel uncomfortable when observing an exchange between two parties that they perceive as unfair or violating the principles of human dignity. Such transactions may be considered inappropriate, distasteful, or even repugnant.

Markets only function well if they are accepted by people. Thus, the tastes and moral convictions of people vis-à-vis transactions of others have to be considered. Repugnance limits which transactions are acceptable, and can determine whether certain markets exist or not. However, repugnance is hard to predict (Roth, 2007). A better understanding of what makes a transaction objectionable is essential for market design, since it can help to structure exchanges in a way that alleviates such concerns.

A number of reasons have been put forward to explain why certain exchanges are considered objectionable, (ob)noxious, toxic, or repugnant. The main objections can be subsumed under two properties of such exchanges. (1) Transactions are likely to be objected to if outcomes are *extreme*, such as when human dignity is at stake, when selling body parts, or when the foundations of democracy are challenged (Kanbur, 2004; Satz, 2008). This property relates to the consequences of a transaction. (2) Transactions can be repugnant when at least one of the parties involved *lacks agency* (Kanbur, 2004; Roth, 2007). Limited agency or outright coercion can be caused by poverty when a person is forced to engage in trades that she would otherwise not accept, or when another person makes the decision on behalf of the person affected.[1] Furthermore, agency can also be weak when the decision maker lacks information about the consequences of the transaction, e.g., about the health consequences of losing a kidney. Relatedly, social pressure can be coercive—for example, when the permission of a certain transaction raises expectations that individuals engage in

[1]For example, in southern India most people who sold their kidney—mainly to repay household debt—were women, see Goyal et al. (2002). This observation together with the prevailing gender inequality raises doubts about the voluntary nature of the transactions.

it, especially if others have accepted the transaction before (Satz, 2008). The inability of persons involved in the transaction to make autonomous decisions is often referred to when justifying the prohibition of drugs and gambling, child pornography, indentured servitude, the sale of organs from living donors, prostitution, and forced marriage.

With the help of a laboratory experiment, we disentangle the causes of repugnance. An experiment is useful since many repugnant transactions—such as indentured servitude, prostitution, surrogacy, and the sale of organs—can be objectionable for multiple reasons. In addition to the outcomes being extreme and the lack of agency of the parties involved, the transactions can exert negative externalities, e.g., prostitution increasing neighborhood crime (Roth, 2007). In general, exchanges that are deemed repugnant have multiple features that are potentially problematic. Thus, without a controlled experiment, it cannot be observed which of the features are relevant and whether they reinforce each other.

We take an empirical approach to studying what makes a transaction repugnant, and investigate the role of limited agency, extreme consequences, and the interaction between the parties. While a lack of agency may be acceptable when a transaction has only minor consequences, we expect that the demands regarding the freedom of choice of the affected party increase with the importance of the transaction for the person's livelihood. Regarding lack of agency, we consider situations where one party cannot decide freely because (i) she is not able to reject the transaction offered, (ii) she has incomplete information about the transaction, (iii) a third person who profits from the transaction takes the decision on behalf of her, or (iv) she is forced to proceed with the transaction due to social pressure exercised by other parties agreeing to a similar transaction.

Each of the four situations regarding limited agency is studied both for an extreme outcome and a neutral outcome. For the extreme outcome, subjects had to listen to a high-pitched tone with a headset. In the instructions, the tone is described as creating a sensation of pain, especially when exposed to it for some time. Participants experienced the tone briefly before the transaction took place. Depending on the outcome of the transaction, subjects had to listen to the tone for 20 minutes, 10 minutes, or not at all. The alternative neutral outcome is waiting in the laboratory for the same amount of time. Depending on the treatment,

subjects were able to trade the painful tone or the waiting time, possibly with no or little say of one of the parties.

Two sets of treatments were conducted. In the buyer-seller treatments, two players were each endowed with 10 euros and the obligation to listen to the painful tone for 10 minutes (or wait in the laboratory for 10 minutes). One of the players (the seller) could offer any sum of money between 0 and 10 euros together with the 10 minutes of the tone. Depending on the treatment, the offer was decided upon by the other player (the buyer), by a third party (also endowed with 10 euros and 10 minutes of tone), or was implemented automatically. In the second set of treatments, called peer pressure treatments, both players were not assigned the painful tone but could agree to listen to it for 10 minutes in return for 5 euros paid by the experimenter. In the baseline of the peer pressure treatments, the players' decisions were independent from each other, whereas in the peer pressure treatment, if one of the two players agreed to listen to the tone in return for the money, the other player was forced to accept the transaction, as well.

We find that spectators are overall more likely to prohibit transactions involving the tone than the waiting time. This provides support for the hypothesis that extreme outcomes can generate repugnance. Moreover, we observe that limiting the agency of the parties increases prohibition rates when the outcome is extreme. In particular, the rate of spectators prohibiting the transaction involving the tone increases significantly from 40% in the treatment with full agency to more than 60% when the buyer cannot reject the offer and to about 70% when a third party decides on behalf of the buyer and profits from the transaction. In contrast, limited information for the buyer has no significant effect on the prohibition rate. Spectators are also more likely to prohibit a transaction with peer pressure than without it. The same pattern of treatment differences is observed for the treatments with waiting time but the prohibition rates are much lower and the differences between the treatments varying the agency are mostly insignificant.

To understand why spectators prohibit certain transactions, we elicited the beliefs about a number of properties of the transaction. We find that the perceived painfulness of the tone increases the likelihood that the transaction is prohibited across all treatments. Moreover,

we observe that the higher the belief about the sum of money offered, the less likely the spectators are to prohibit the transaction in the case of full agency when the outcome is extreme. An expected high monetary offer also lowers the prohibition rate when the outcome is harmless and there is no agency. At the same time, there is no such relationship when agency is limited and outcomes are extreme. Thus, spectators who prohibit transactions with extreme outcomes and limited agency are not willing to engage in tradeoffs with monetary incentives.

While we are not aware of any empirical evidence regarding the role of extreme outcomes and limited agency for repugnance, other determinants of repugnance have been studied before. Offering large sums of money can make an exchange repugnant. Paying a lot for the participation in a medical trial decreases the likelihood of approval of the trial by a subgroup of subjects, as found in a vignette study (Ambuehl et al., 2015). Using an incentivized field experiment, Stüber (2020) documents this preference for a subset of participants and shows that it is due to concerns that subjects with high opportunity costs are swayed by large rewards. Providing general information about the efficiency of markets does not increase the approval of repugnant markets (Elias et al., 2015). However, explaining the benefits of organ markets for society increases their approval. Moreover, people are willing to make tradeoffs in the sense that they accept monetary rewards for kidney donors if this produces a sufficiently large additional number of transplants (Elias et al., 2019). Finally, Roth and Wang (2020) document that the repugnance of transactions such as surrogacy and prostitution is not correlated with the legal rules of a country, based on a representative survey in four countries.

The spectator design for eliciting moral decisions is from Konow (2000). Ambuehl et al. (2021) have applied this design to decisions concerning other people's choice sets in the context of time preferences. They observe that spectators make paternalistic decisions that are consistent with projections of their own aspirations onto others' choices. To our knowledge, we are the first to use the spectator design to study the repugnance of transactions.

2 Experimental design and hypotheses

2.1 General setup of the experiment

We investigate how lack of agency and extreme consequences affect how spectators evaluate a transaction. Spectators are asked whether they would like to prohibit a transaction that takes place between experimental subjects in another session. The spectators can prohibit or allow transactions involving two different negative experiences. In Situation 1, the negative experience is listening to a painful tone (85dB and 2083 Hz) with a headset, and in Situation 2, the negative experience is waiting in the laboratory.[2] Spectators make their decisions for the two negative experiences simultaneously.

We check the validity of the assumption that listening to the tone is perceived as a negative experience and that it is worse than waiting in the lab. We use the Becker-DeGroot-Marschak method to elicit the spectator's willingness to accept the two experiences for one minute. Moreover, we collect an unincentivized self-reported measure of how painful the tone and annoying the waiting time is.

If a spectator prohibits the transaction, the experimental subjects keep their initial endowments. If a spectator allows the transaction, the experimental subjects proceed with the transaction. The spectators' decisions are implemented with a probability of .1. Thus, for every 10 spectators we conducted one stakeholder session for which the spectators made the decisions. The stakeholder session was conducted after the spectator sessions. The reason for limiting the number of stakeholders is that our study focuses on the decisions of spectators, not on the behavior of stakeholders.

2.2 Treatments

Buyer-seller treatments. We conducted a set of experiments where subjects were buyers and sellers. In the baseline treatment, called Full Agency, players A and B are each endowed with 10 minutes of the negative experience and 10 euros. We chose equal initial

[2]The experience of waiting in the laboratory can be thought of as listening to a 0 dB tone. Hence Situation 1 and 2 are similar except for the extremity of the experience (listening to a 0 dB tone versus listening to a 85 dB tone).

endowments for all players to ensure that transactions cannot restore equality between the players, which may have created a focal point. Both players go through the negative experience for one minute to be able to imagine what 10 minutes of the experience entails. Player A offers a monetary amount between 1 and 10 euros in exchange for his 10 minutes of the negative experience to player B. If player B accepts the offer, she gets the amount of money player A offers to her and goes through the negative experience for an extra 10 minutes, making it 20 minutes of the experience. If she rejects, both players end up with their initial endowment of 10 euros and the 10 minutes of the negative experience.[3]

In the No Agency treatment, we investigate a situation where player B is forced to accept the transaction. Thus, the only difference compared to the Full Agency treatment is that player B cannot reject player A's offer. This captures situations where a person cannot reject an offer, e.g., she has to sell her kidney due to extreme poverty.

In the No Info treatment, we study a situation where player B is not informed about the nature of the negative experience, i.e., subjects in the role of player B do not go through the one-minute experience before accepting or rejecting A's offer. This is known by subjects in the role of player A. Otherwise the treatment is identical to the Full Agency treatment. This treatment is inspired by situations where people are not fully aware, for example, of the health risks of donating a kidney.

In the Third Party treatment, we investigate a situation where a third party can accept or reject player A's offer or not on behalf of player B. There are three players, player A, player B, and a third player C who will make the decision on behalf of player B. Players A, B, and C are endowed with 10 minutes of the negative experience and 10 euros each. All players go through the negative experience for 1 minute to understand the nature of it. Player A makes a monetary offer to allocate his 10 minutes of negative experience to player B. If player C accepts the offer on behalf of player B, players B and C share the money that player B has offered, and player B goes through the negative experience for an extra 10 minutes. If player C rejects, all participants end up with their initial endowments. The third

[3]We determined the maximum amount of money of 10 euros that player A can allocate to player B based on the elicited valuation of listening to 10 minutes of the tone. As reported in Erkut (2018), the subjects' willingness to accept listening to 10 minutes of a similar tone is on average 4.75 euros.

party C could be a family member who forces a person to sell her kidney to earn money for the household.

Peer pressure treatments. In this set of experiments, we investigate situations where the transaction of one person may result in negative externalities for others. In particular, we examine a loss of agency that is due to other people accepting a trade. In the Peer Pressure treatment, there are two players, player A and player B. Both players are endowed with 10 euros each, and they can earn an additional 5 euros each by accepting to be exposed to a negative experience for 10 minutes (either waiting in the lab or listening to the painful tone). Both players go through the negative experience for 1 minute. If at least one of the players accepts to be exposed to the negative experience for 5 euros, then the other player is forced to be exposed to the negative experience in exchange for 5 euros as well, independent of her own decision. In the control treatment called No Peer Pressure, the only difference is that the players can make choices independent of each other. Thus, a player is not forced to accept a transaction by the decision of the other player.

At the end of the buyer-seller treatments, we elicit the spectators' beliefs about how much money player A will offer to player B (and to player C in the Third Party treatment). We also ask spectators whether they believe the offer will be accepted in all treatments except the No Agency treatment. Similarly in the peer pressure treatments, we elicit the spectators' beliefs about whether players will accept the offer by the experimenter.

The experiment was programmed in z-Tree (Fischbacher, 2007) and was conducted at the TU-WZB Experimental Laboratory at Technical University Berlin with students recruited through ORSEE (Greiner, 2015). Subjects signed a consent form before participating in the experiment. The instructions and the consent form can be found in Appendix A.4. At the end of the experiment, subjects were asked to answer a post-experimental questionnaire which included the moral foundations questionnaire (Graham et al., 2011). In total, 315 subjects participated in 12 experimental sessions. We collected 70 observations for the Full Agency treatment, 59 for the No Agency treatment, 59 for the No Info treatment, 38 for the Third Party treatment, 45 for the Peer Pressure treatment, and 44 for the No Peer Pressure treatment.

2.3 Hypotheses

The hypotheses are based on the literature that discusses repugnance and its determinants—see Kanbur (2004), Roth (2007), and Satz (2008). We formulate

Hypothesis 1 (Extreme outcomes)**.**
Spectators are more likely to prohibit transactions with extreme outcomes (listening to the painful tone) compared to transactions with mild consequences (waiting).

One potential reason for the repugnance of transactions is that one or more of the transacting parties cannot decide freely. Lack of agency is expected to be problematic, especially when the outcome of the transaction is extreme. Hence, we formulate

Hypothesis 2 (Agency)**.**
Spectators are more likely to prohibit transactions with limited agency than with full agency. Treatment differences are stronger for transactions regarding extreme outcomes (listening to the painful tone) than for transactions with mild consequences (waiting).

3 Results

We first present the findings on the treatment effects of extreme outcomes and limited agency using non-parametric tests. Then, we proceed to the role of beliefs, and present regression analyses. All results are significant at the 5% level unless otherwise indicated.

Our hypotheses and the interpretation of our results rest on the assumptions that listening to the tone is a worse experience than waiting in the laboratory, and that the tone is perceived as painful. Our incentivized and non-incentivized measures confirm that subjects perceive the tone as painful and that they find listening to the tone more discomforting than waiting. See Appendix A.1 for the analyses.

3.1 The role of extreme outcomes and agency for repugnance

Our main outcome of interest is whether the spectators prohibit or allow the transactions. Each spectator makes this decision both for the negative experience of listening to a painful tone, and for the negative experience of waiting in the laboratory.

In line with Hypothesis 1, we find

Result 1 (Extreme outcomes)**.**
Spectators are more likely to prohibit transactions involving the tone compared to transactions involving the waiting time.

SUPPORT: Figure 1 shows the likelihood to prohibit transactions involving the tone and the waiting time across treatments. In the buyer-seller treatments, people are significantly more likely to prohibit the transaction involving the tone than that transaction involving the waiting time (one-sided Fisher's exact test, $p < 0.001$ for all treatments).

In the peer-pressure treatments, we make a number of similar observations: spectators are more likely to prohibit transactions involving the tone compared to those involving the waiting time in the Peer Pressure treatment (Fisher's exact test, $p = 0.004$). However, there is no significant effect in the No Peer Pressure treatment ($p = 0.128$) where prohibitions are rare both for transactions involving the tone and the waiting time. Note that these comparisons are based on observations within subjects. Thus, they could be driven by experimenter demand. This is not the case for the effect of limited agency that is measured between subjects and that we consider next.

Result 2 (Agency)**.**
*Spectators are more likely to prohibit transactions in the treatments with a lack of agency (*No Agency*,* Third Party*, and* Peer Pressure*) than in the treatments with agency (*Full Agency *and* No Peer Pressure*). Treatment differences are more pronounced for decisions involving the tone than the waiting time. Prohibition rates*

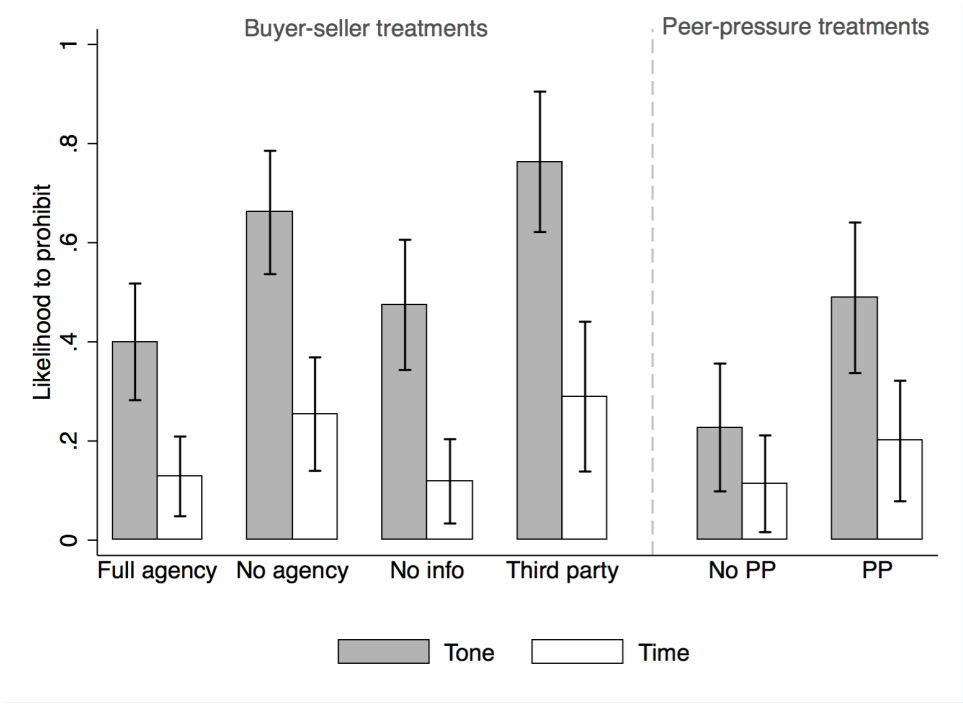

Figure 1: Likelihood to prohibit transactions with tone and time

Notes: The bars represent the proportions of spectators prohibiting the transaction. The vertical lines display the 95% confidence intervals. NoPP and PP stand for No Peer Pressure and Peer Pressure respectively.

*with weak agency due to a lack of information (*No Info*) do not differ from* Full Agency*.*

SUPPORT: Table 1 reports the p-values of one-sided Fisher's exact tests regarding the null hypothesis that the prohibition frequencies are smaller or equal in the baseline treatments (i.e., the Full Agency and the No Peer Pressure treatments) than in the respective lack-of-agency treatments, for both transactions. In the buyer-seller treatments, the likelihood that spectators prohibit a transaction with the tone is significantly different between the Full Agency and No Agency as well as the Third Party treatments at the 1% level (one-sided Fisher's exact test). The likelihood to prohibit is not significantly different between the Full Agency and No Info treatments.

	No Agency	No Info	Third Party	Peer Pressure
Tone	**0.003**	0.250	**0.000**	**0.009**
Time	0.055	0.541	**0.038**	0.204

Table 1: Significance of the prohibition of transactions with tone and time

Notes: The table reports the p-values of one-sided Fisher's exact tests regarding the null hypothesis that the prohibition frequencies are smaller or equal in the baseline treatment (Full Agency and No Peer Pressure, respectively, than in the corresponding lack-of-agency treatment, for both transactions. The test results that are significant at the 5% level are indicated in bold.

For the decisions involving waiting time, the same pattern of treatment effects emerges than for the tone, albeit with much smaller differences: the likelihood to prohibit is marginally different between the Full Agency and No Agency treatments and significantly different between the Full Agency and Third Party treatments. Again, the likelihood to prohibit is not significantly different between the Full Agency and No Info treatments.

Regarding limited agency due to peer pressure, we find that the likelihood to prohibit the transaction involving the tone is significantly greater in the Peer Pressure treatment than in the No Peer Pressure treatment. However, there is no significant difference for the two treatments with waiting time. Hence, the treatment differences with respect to prohibiting the transaction are again stronger for the tone than for the waiting time.

3.2 The role of beliefs

A spectator's likelihood to prohibit a transaction may be mediated by factors other than the treatment conditions. This includes the belief about how much money player A will offer player B, and whether player B will accept the offer or not. The spectator's likelihood to prohibit may also be affected by how uncomfortable she finds the negative experience. To control for these potential factors, we elicited the respective beliefs and include them in the regressions. The linear regression results for the transactions with the tone in the buyer-seller treatments are provided in Table 2.[4]

Model 1 in Table 2 replicates the findings from the non-parametric tests regarding treatment effects: spectators are more likely to prohibit a transaction with the tone in the No Agency

[4]Logistic regressions yield qualitatively similar results, see Appendix A.2.

Table 2: Determinants of likelihood to prohibit transactions with tone in buyer-seller treatments

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
No Agency	0.261***	0.318***		0.316***	0.315***			-0.113	
	(0.086)	(0.111)		(0.112)	(0.104)			(0.181)	
No Info	0.075	0.116	0.131	0.115	0.131	0.128	0.144	-0.310	-0.271
	(0.088)	(0.098)	(0.095)	(0.099)	(0.093)	(0.096)	(0.091)	(0.201)	(0.277)
Third Party	0.363***	0.412***	0.481***	0.411***	0.459***	0.477***	0.521***	-0.038	-0.079
	(0.091)	(0.1)	(0.097)	(0.1)	(0.093)	(0.097)	(0.091)	(0.190)	(0.320)
Money		0.014	0.014	0.013	0.002	0.013	0.004	-0.073***	-0.053*
		(0.014)	(0.016)	(0.015)	(0.015)	(0.017)	(0.017)	(0.026)	(0.029)
Accept			-0.112**			-0.108**	-0.109**		-0.123
			(0.044)			(0.045)	(0.042)		(0.076)
WTA				0.012		0.028			
				(0.054)		(0.062)			
Painself					0.101***		0.091***	0.1***	0.087***
					(0.021)		(0.022)	(0.02)	(0.022)
No Agency ×Money								0.094***	
								(0.036)	
No Info ×Money								0.091**	0.071*
								(0.039)	(0.041)
Third Party ×Money								0.106***	0.088**
								(0.033)	(0.036)
No Info ×Accept									0.029
									(0.097)
Third Party ×Accept									0.067
									(0.114)
Constant	0.400***	0.295***	0.559***	0.283**	-0.167	0.522***	0.137	0.212	0.463**
	(0.059)	(0.105)	(0.154)	(0.113)	(0.129)	(0.173)	(0.174)	(0.172)	(0.213)
Observations	226	179	144	179	179	144	144	179	144
Adjusted R^2	0.066	0.076	0.114	0.071	0.175	0.109	0.197	0.198	0.207

Notes: The table reports the coefficient estimates from linear regressions where the dependent variable is the binary variable specifying whether the decision maker prohibits the transaction with the tone. The $NoAgency$, $NoInfo$, and $ThirdParty$ variables are treatment dummies, where $FullAgency$ is the baseline treatment. $Money$ specifies the spectator's belief about the amount of money offered by player A, and $Accept$ specifies the spectator's belief as to whether the offer will be accepted. WTA is the spectator's incentivized willingness to accept listening to one minute of the tone. $Painself$ is the self-reported painfulness of the tone for oneself. Model 1 has the greatest number of observations since $Money$ and $Accept$ were not elicited from all the subjects. Models 3, 6, 7 and 9 have fewer observations compared to the other models because treatment No Agency is excluded. Robust standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

and THIRD PARTY treatments than in the FULL AGENCY treatment. Model 2 includes the spectator's (non-incentivized) belief regarding how much money player A will offer to player B together with the tone ($Money$). This belief is not significantly correlated with the likelihood to prohibit the transaction across treatments. When controlling for the spectator's (non-incentivized) belief regarding how likely it is that player B will accept player A's offer (*Accept* in model 3), we find that as the spectator's belief in player B accepting the offer increases, the likelihood to prohibit a transaction decreases.[5] The treatment difference between FULL AGENCY and THIRD PARTY remains significant after including these controls.

Next, we examine how the spectator's perception and evaluation of the painful tone influence the likelihood to prohibit (models 4 and 5)using two different variables in separate regressions. WTA is the spectator's incentivized willingness to accept the bad experience for one minute, elicited with the Becker-DeGroot-Marschak method. The variable $painself$ captures the reported measure of how painful the tone is (non-incentivized).[6] The results suggest that the WTA does not significantly influence the likelihood to prohibit whereas $Painself$ increases the likelihood to prohibit. The likelihood to prohibit decreases with the belief that player B accepts the offer (*Accept*) and increases with the perceived painfulness of the tone ($Painself$), but the treatment effects remain almost unchanged.[7]

Finally, we investigate whether there are treatment differences with respect to the role of beliefs about the amount of money offered, and about the acceptance of the offer (models 8 and 9). The insignificant aggregate effect of the variable $Money$ in model 2 masks important treatment differences, see model 8. In the FULL AGENCY treatment, the likelihood to prohibit the transaction is lower the higher the amount of money offered. Thus, spectators are reluctant to prohibit transactions where the agent accepting the painful tone is compensated with a considerable sum of money. This does not hold true for the three treatments with limited agency. As indicated by the significant interaction terms, the effect of the amount

[5]For model 3, we exclude the data from the NO AGENCY treatment where B does not make a decision.

[6]We also asked subjects how painful they think the tone is for others. The variable $Painother$ has the same directional effect as $Painself$ but is mostly insignificant. The regressions are available from the authors upon request.

[7]Since $Painself$ and not WTA is the significant predictor of the likelihood to prohibit, we use $Painself$ as the control variable for the perception of the tone in models 8 and 9.

offered in the three treatments with limited agency is significantly different than in the baseline treatment. In fact, the correlation between the amount offered and the likelihood to prohibit is not significant for all three treatments with limited agency.[8] Thus, if agency is limited, a higher amount of money offered does not compensate for the extreme outcome in the eyes of spectators.

There are no significant treatment differences of the belief that B accepts the offer, as shown by model 9. In the baseline treatment, the relationship between the belief that B accepts and the likelihood to prohibit is insignificant. Moreover, Wald tests suggest that the effect of the amount offered on the likelihood to prohibit is not statistically significant for the No info ($p = 0.128$) and Third party ($p = 0.499$) treatments.

The observed treatment effects remain significant after including the variables for the beliefs and the interaction dummies. In model 8, the average marginal effect of the treatment variation (compared to the baseline treatment) on the likelihood to prohibit stays significant for the No agency ($p = 0.003$) and Third Party ($p < 0.001$) treatments. In model 9, the average marginal effect of the treatment variation remains significant for the Third Party treatment ($p < 0.001$).

Analogous regressions to those in Table 2 for the buyer-seller treatments with waiting time reveal that none of the treatment dummies are significantly different from zero. The results are summarized in Table 4 and discussed in Appendix A.2. The only significant finding is a negative coefficient for the belief regarding the amount offered on the likelihood to prohibit in the No Agency treatment (Wald test, $p = 0.003$).

For the peer pressure treatments, Table 3 presents the results from the regressions controlling for the elicited beliefs. The analogous regressions for the waiting time can be found in Appendix A.2. The results suggest that the difference between the treatments with and without peer pressure for transactions with the painful tone is robust to controlling for the beliefs. At the same time, the beliefs have some explanatory power: the belief that a player

[8] Wald tests suggest that the positive effect of the belief regarding the amount offered on the likelihood to prohibit is not significant for the No Agency ($p = 0.402$), No Info ($p = 0.436$), and Third Party ($p = 0.119$) treatments.

will accept 5 euros to listen to the tone (*Accept*) is correlated with spectators not prohibiting the transaction. No significant treatment effects nor significant effects of the beliefs are found for the treatments with the waiting time.

We also investigated whether subjects' scores on the Moral Foundations Questionnaire are predictive of their likelihood to prohibit a transaction. Detailed descriptions and the results are provided in Appendix A.3. The main takeaway from these analyses is that there are no robust relationships between any of the moral foundations and the likelihood to prohibit transactions.[9]

[9]In particular, the people who find it more morally wrong to harm someone are less likely to prohibit the transaction with the tone in the buyer-seller treatments but the same does not hold true for those with the waiting time. In contrast, they are more likely to prohibit the transaction in the peer pressure treatments with the waiting time but not with the tone.

Table 3: Determinants of the likelihood to prohibit transactions with tone in peer pressure treatments

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Peer Pressure	0.262***	0.239**	0.237**	0.274***	0.220**	0.253***	0.388
	(0.099)	(0.095)	(0.102)	(0.095)	(0.100)	(0.094)	(0.298)
Accept		-0.177***			-0.171***	-0.133**	-0.111
		(0.053)			(0.054)	(0.064)	(0.0805)
WTA			0.109		0.092		
			(0.069)		(0.067)		
Painself				0.095***		0.063*	0.0617*
				(0.029)		(0.036)	(0.036)
Peer Pressure ×Accept							-0.053
							(0.101)
Constant	0.227***	0.695***	0.109	-0.218	0.580***	0.285	0.230
	(0.064)	(0.166)	(0.084)	(0.142)	(0.184)	(0.317)	(0.348)
Observations	89	89	89	89	89	89	89
Adjusted R^2	0.064	0.156	0.078	0.138	0.164	0.177	0.169

Notes: The table reports the coefficient estimates from linear regressions where the dependent variable is the binary variable specifying whether the spectator prohibits the transaction with the tone. *PeerPressure* is the treatment dummy for the Peer Pressure treatment, where treatment No Peer Pressure is the baseline. *Accept* specifies the spectator's belief as to whether the offer will be accepted. WTA is the spectator's incentivized willingness to accept listening to one minute of the tone. $Painself$ is the self-reported painfulness of the tone for oneself. Robust standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Overall, the treatment differences regarding transactions with the tone stated in results 1 and 2 remain significant once we add the control variables. We summarize the main findings regarding the role of the beliefs:

(i) *In the buyer-seller treatments with the tone, the likelihood to prohibit decreases the higher the expected amount of money offered in the* Full Agency *treatment but there is no such relationship in the treatments with limited agency. The belief that player B accepts the transaction is negatively correlated with the likelihood to prohibit when aggregating over all treatments.*

(ii) *In the peer pressure treatments with the tone, the belief that players will accept listening to the tone is negatively correlated with spectators prohibiting the transaction.*

For the treatments with waiting time, the regressions yield no significant treatment effects, see Table 4 in the Appendix.

4 Conclusions

Our results confirm that extreme outcomes and agency are important determinants of repugnance. Spectators prohibit transactions involving an extreme outcome (listening to a painful tone) more often than transactions involving a relatively mild outcome (waiting in the laboratory). Moreover, spectators are more likely to prohibit the transaction when a participant cannot reject an offer, or when a third party decides on her behalf, compared to situations where the participant can reject the transaction. Similarly, the likelihood to prohibit is greater when a transacting party's action forces another person to accept the transaction. On the other hand, limited agency due to incomplete information about the transaction does not result in a greater likelihood to prohibit compared to full information. One potential reason for this is that even though the vulnerable party has limited information, she can actively decide to accept the transaction or not. Moreover, the vulnerable party has some information about the extreme outcome, since she knows that the tone is 85 dB and that it will not harm her (as stated in the consent form). This may limit the external validity of the treatment, since, for example, in kidney sales, sellers may have very little information about the potential health effects. Hence, it is possible that the role of limited information on the likelihood to prohibit is underestimated by the No Info treatment.

Transactions are more frequently prohibited when the outcome of the transaction is extreme (tone) than when it is neutral (waiting time). This result cannot be explained by the desire to protect the vulnerable party from the greater overall utility loss resulting from the extreme outcome. If this were the case, then the prohibition rates should be negatively correlated with the belief about the amount of money offered. Yet, we do not observe such a tradeoff for the transactions with the extreme outcome. Hence, the spectators do not think that a transaction with limited agency and extreme consequences becomes more acceptable when more money is offered. In contrast, spectators consider the amount of money offered as relevant for the neutral outcome with limited agency.

A significant number of people prohibit transactions with extreme outcomes even if the transacting parties have full agency. This suggests that limited agency is not the only reason why people find such transactions repugnant. While the prohibition rates in our two baseline treatments differ—40% in the Full Agency treatment and 20% in the No Peer Pressure treatment, a comparison is not meaningful since the treatments differ along many dimensions. While both treatments deal with transactions regarding 10 minutes of the painful tone, in the Full Agency treatment the exchange leads to highly unequal outcomes regarding the negative experience (20 minutes of the tone versus 0 minutes). In contrast, in the No Peer Pressure treatment, subjects end up with either 0 or 10 minutes of the tone. Moreover, the proposal is made by a participant in the Full Agency treatment while it is made by the experimenter in the No Peer Pressure treatment, another potentially relevant difference.

Finally, note that equality of outcomes is guaranteed in the Peer Pressure treatment. The prohibition rate in this treatment indicates that limited agency trumps equality concerns in our setup. Nevertheless, inequality of outcomes could be an additional cause of repugnance and deserves closer scrutiny in future research.

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A Online appendix

A.1 Evaluations of tone and time

In this section, we examine the spectators' perception and evaluation of the tone and waiting time. We utilize both incentivized and non-incentivized measures for the valuations. WTA is the spectators' incentivized willingness to accept the bad experience, elicited by using the Becker-DeGroot-Marschak method. Variables $painself$ and $annoyself$ are non-incentivized, self-reported measures of how painful the tone is and how annoying the waiting time is, respectively. Moreover, *painother* and *annoyother* are non-incentivized, self-reported measures of the spectators' beliefs on how painful others find the tone and how annoying they find the waiting time.

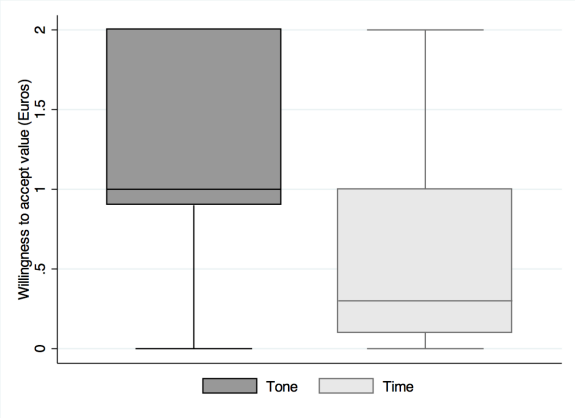

Figure 2: WTA values of tone and waiting time

Notes: Figure 2 shows the distributions of the incentivized willingness to accept (WTA) values for listening to one minute of the tone (boxplot on the left) and for waiting one minute in the laboratory (boxplot on the right). The boxes cover the first to third quartile (the interquartile range or IQR). The horizontal lines inside the boxes show the median, and the whiskers below and above the boxes span $1.5 * IQR$ each.

Figure 2 shows the distributions of the incentivized WTA values for listening to one minute of the tone and for waiting one minute in the laboratory. The figure shows that people assign greater values to the tone than to the waiting time. People ask for on average 1.21 Euros ($SD = 0.04$) for listening to one minute of tone whereas they ask for 0.53 Euros ($SD = 0.03$) for waiting one minute. A Wilcoxon rank-sum test shows that this difference is significant at the 1% level ($p < 0.001$).

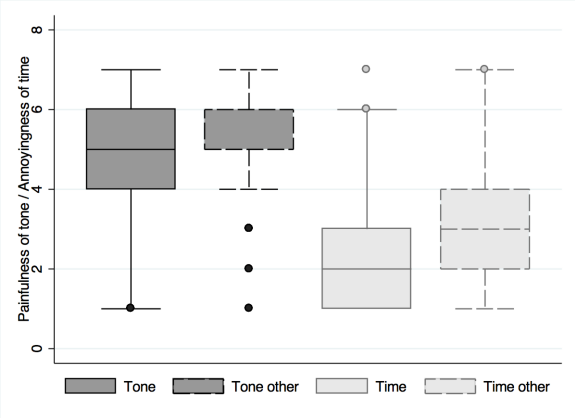

Figure 3: Self-reports regarding how painful the tone and how annoying the wait are

Notes: Figure 3 shows the distributions of the subjects' self-reports regarding how painful the tone and how annoying the waiting are, and their beliefs about how painful/annoying others think the tone/waiting is. All four measures are elicited using Likert scales ranging from 1 to 7. The boxes cover the first to the third quartile (the interquartile range or IQR). The horizontal lines inside the boxes show the median, and the whiskers below and above the boxes span $1.5 * IQR$ each. The dots represent outliers.

Figure 3 displays the distributions of the variables $painself$, $painother$, $annoyself$, and $annoyother$. The distributions show that people find listening to the tone more uncomfortable than waiting (comparing the first and third boxplot), and expect other people to evaluate it in the same way (comparing the second and fourth boxplot). In particular, on a scale from one to seven, people on average evaluate the painfulness of the tone as 4.76 ($SD = 0.09$), and they believe others evaluate it as 5.16 ($SD = 0.07$). In contrast, on a scale from one to seven, people on average evaluate the waiting time as annoying with a value of 2.45 ($SD = 0.08$), and they believe others evaluate it with 2.84 ($SD = 0.07$). Wilcoxon rank-sum tests suggest that people find listening to the tone significantly more discomforting than waiting ($p < 0.001$), and they also believe that others find listening to the tone significantly more discomforting than waiting ($p < 0.001$).

Figure 3 also suggests that people tend to believe that the tone is more painful for others than for themselves (comparing the first and second boxplot), and that the waiting time is more annoying for others than for themselves (comparing the third and fourth boxplot). Wilcoxon signed-rank tests confirm that people evaluate the tone as more painful for others

than for themselves ($p < 0.001$), and that people evaluate the waiting time as more annoying for others than for themselves ($p < 0.001$).

Summing up, we find that both listening to the tone and waiting in the laboratory are seen as negative experiences, since the subjects are willing to pay money to avoid them, and that listening to the tone is seen as more discomforting than waiting. Moreover, the subjects evaluate the tone as painful, with an average perceived painfulness of the tone of 4.76 on scale from one to seven. These results show that it is appropriate to use listening to the tone as the extreme outcome and waiting as the neutral outcome in our experiments.

A.2 Additional regression results

A.2.1 Treatments with waiting time

Table 4 presents the regression results for the spectators' decisions to prohibit the transaction with the waiting time. According to the baseline regression without controls (model 1), spectators are more likely to prohibit a transaction in the No Agency and Third Party treatments than in the Full Agency treatment, but these differences are insignificant ($p<0.10$). In model 2, where we control for the spectator's belief regarding how much money player A will send to player B (*Money*), these treatment differences are further reduced. Also, the effect of the amount offered is not significant for the baseline treatment, and there is no significant difference between treatments with respect to this effect (see model 8).

A Wald test suggests that there is a significant negative effect of the belief regarding the amount offered on the likelihood to prohibit in the No Agency treatment ($p = 0.003$). Further Wald tests show that the effect of the belief regarding the amount offered is not significantly different from zero for the No Info ($p = 0.687$) and Third party ($p = 0.779$) treatments. In model 3, once we add the spectator's belief regarding the likelihood that player B will accept player A's offer (*Accept*) as an explanatory variable, the likelihood to prohibit is greater in the Third Party treatment than in Full Agency treatment but only at a 10% level of significance. This treatment difference disappears once the interaction effects are controlled for in model 9. Finally, the variables WTA and $Annoyself$ do not significantly influence the likelihood to prohibit.[10],[11]

In Table 5, we document that the treatment effects are insignificant in the peer pressure treatments with waiting time, also when controlling for the beliefs.

[10]We also asked subjects for how annoying they think the waiting time is for others. The variable *Annoyother* has the same directional effect as $Annoyself$ and is insignificant. The regressions are available from the authors upon request.

[11]The variables *Money*, *Accept*, and WTA are elicited separately for transactions with tone and time although they hold the same name in the regression tables for the transactions.

Table 4: Determinants of likelihood to prohibit transactions with waiting time in buyer-seller treatments

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
No Agency	0.126*	0.123		0.114	0.128			0.183	
	(0.070)	(0.092)		(0.094)	(0.091)			(0.144)	
No Info	-0.01	-0.036	-0.023	-0.04	-0.029	-0.028	-0.0217	-0.042	-0.112
	(0.059)	(0.068)	(0.067)	(0.067)	(0.068)	(0.067)	(0.068)	(0.133)	(0.278)
Third Party	0.161*	0.131	0.152*	0.127	0.140	0.147	0.154*	0.127	-0.159
	(0.085)	(0.092)	(0.091)	(0.092)	(0.093)	(0.092)	(0.0913)	(0.148)	(0.289)
Money		-0.0195	-0.008	-0.026	-0.023	-0.013	-0.009	-0.018	-0.006
		(0.015)	(0.02)	(0.017)	(0.016)	(0.02)	(0.02)	(0.038)	(0.037)
Accept			-0.042			-0.035	-0.041		-0.089
			(0.034)			(0.034)	(0.034)		(0.062)
WTA				0.067		0.075			
				(0.059)		(0.065)			
Annoyself					0.026		0.007	0.026	0.004
					(0.023)		(0.024)	(0.023)	(0.024)
No Agency ×Money								-0.031	
								(0.0405)	
No Info ×Money								0.007	-0.002
								(0.047)	(0.048)
Third Party ×Money								0.008	-0.002
								(0.052)	(0.051)
No Info ×Accept									0.037
									(0.08)
Third Party ×Accept									0.112
									(0.089)
Constant	0.129***	0.196***	0.278**	0.180***	0.132	0.237*	0.260*	0.124	0.387*
	(0.04)	(0.065)	(0.126)	(0.063)	(0.084)	(0.123)	(0.142)	(0.114)	(0.207)
Observations	226	179	144	179	179	144	144	179	144
Adjusted R^2	0.021	0.022	0.021	0.026	0.026	0.025	0.015	0.013	0.000

Notes: The table reports the coefficient estimates from linear regressions with the dependent binary variable specifying whether the decision maker prohibits the transaction with waiting time. The $NoAgency$, $NoInfo$, and $ThirdParty$ variables are treatment dummies, where Full Agency is the baseline category. $Money$ specifies the spectator's belief about the amount of money offered by player A, and *Accept* specifies the spectator's belief as to whether the offer will be accepted. WTA is the spectator's incentivized willingness to accept for waiting for one minute. $Annoyself$ is the self-reported measure of how annoying the waiting time is for oneself. Model 1 has the greatest number of observations since $Money$ and *Accept* were not elicited from all subjects. Models 3, 6, 7, and 9 have fewer observations compared to the other models because treatment No Agency is excluded. Robust standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 5: Determinants of the likelihood to prohibit transactions with waiting time in peer pressure treatments

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Peer Pressure	0.0864	0.0834	0.0792	0.0622	0.0764	0.0626	-0.234
	(0.0773)	(0.0793)	(0.0778)	(0.0775)	(0.0795)	(0.0783)	(0.416)
Accept		-0.0198			-0.0190	0.00835	-0.0336
		(0.0511)			(0.0527)	(0.0591)	(0.0734)
WTA			0.0906		0.0903		
			(0.0733)		(0.0743)		
Annoyself				0.0391		0.0404	0.0411
				(0.0284)		(0.0319)	(0.0318)
Peer Pressure ×Accept							0.0825
							(0.109)
Constant	0.114**	0.186	0.0651	0.0291	0.135	-0.00411	0.148
	(0.0484)	(0.203)	(0.0510)	(0.0719)	(0.217)	(0.268)	(0.311)
Observations	89	89	89	89	89	89	89
Adjusted R^2	0.003	-0.007	0.014	0.019	0.004	0.008	0.003

Notes: The table reports the coefficient estimates from linear regressions where the dependent variable is the binary variable specifying whether the decision maker prohibits the transaction with the time. $PeerPressure$ is the treatment dummy for the Peer Pressure treatment, where $NoPeerPressure$ is the baseline treatment dummy. *Accept* specifies the spectator's belief as to whether the offer will be accepted. WTA is the spectator's incentivized willingness to accept waiting for 1 minute. $Annoyself$ is the self-reported annoyingness of the waiting time. Robust standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

A.2.2 Logistic Models

Table 6: Determinants of the likelihood to prohibit transactions with tone: Marginal effects

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
No Agency	0.261***	0.318***		0.317***	0.306***			0.273***	
	(0.085)	(0.109)		(0.109)	(0.099)			(0.094)	
No Info	0.075	0.116	0.128	0.115	0.126	0.124	0.142*	0.072	0.126
	(0.088)	(0.096)	(0.091)	(0.097)	(0.089)	(0.092)	(0.086)	(0.086)	(0.087)
Third Party	0.363***	0.411***	0.466***	0.411***	0.456***	0.462***	0.498***	0.417***	0.491***
	(0.091)	(0.098)	(0.089)	(0.098)	(0.089)	(0.089)	(0.083)	(0.083)	(0.082)
Money		0.014	0.014	0.013	0.002	0.013	0.003	-0.002	0.001
		(0.014)	(0.016)	(0.015)	(0.015)	(0.017)	(0.017)	(0.014)	(0.016)
Accept			-0.112***			-0.108**	-0.104**		-0.084**
			(0.042)			(0.043)	(0.041)		(0.037)
WTA				0.011		0.027			
				(0.053)		(0.062)			
Painself					0.103***		0.091***	0.101***	0.088***
					(0.021)		(0.021)	(0.021)	(0.021)
Observations	226	179	144	179	179	144	144	179	144

Notes: The table reports the marginal effects from logistic regressions where the dependent variable is the binary variable specifying whether the decision maker prohibits the transaction with the tone. The $NoAgency$, $NoInfo$, and $ThirdParty$ variables are treatment dummies, where Full Agency is the baseline category. $Money$ specifies the spectator's belief about the amount of money offered by player A, and *Accept* specifies the spectator's belief as to whether the offer will be accepted. WTA is the spectator's incentivized willingness to accept listening to 1 minute of the tone. $Painself$ is the self-reported painfulness of the tone. Model 1 has the greatest number of observations since $Money$ and *Accept* were not elicited from all the subjects. Models 3, 6, 7, and 9 have fewer observations compared to the other models due to not including the No Agency treatment. Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 7: Determinants of the likelihood to prohibit transactions with waiting time: Marginal effects

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
No Agency	0.126*	0.119		0.110	0.124			0.079	
	(0.070)	(0.091)		(0.092)	(0.088)			(0.081)	
No Info	-0.010	-0.035	-0.024	-0.040	-0.030	-0.029	-0.022	-0.030	-0.013
	(0.058)	(0.069)	(0.065)	(0.069)	(0.068)	(0.065)	(0.065)	(0.068)	(0.064)
Third Party	0.161*	0.129	0.153*	0.125	0.139	0.146	0.156*	0.144	0.150*
	(0.084)	(0.092)	(0.091)	(0.093)	(0.092)	(0.092)	(0.091)	(0.093)	(0.088)
Money		-0.021	-0.008	-0.027	-0.025	-0.013	-0.009	-0.051	-0.006
		(0.019)	(0.020)	(0.020)	(0.020)	(0.020)	(0.020)	(0.034)	(0.021)
Accept			-0.039			-0.031	-0.038		-0.041
			(0.031)			(0.031)	(0.031)		(0.030)
WTA				0.064		0.068			
				(0.053)		(0.057)			
Annoyself					0.026		0.007	0.027	0.003
					(0.020)		(0.022)	(0.020)	(0.022)
Observations	226	179	144	179	179	144	144	179	144

Notes: The table reports the marginal effects from logistic regressions where the dependent variable is the binary variable specifying whether the decision maker prohibits the transaction with the time. The $NoAgency$, $NoInfo$, and $ThirdParty$ variables are treatment dummies, where FULL AGENCY is the baseline category. $Money$ specifies the spectator's belief about the amount of money offered by player A, and *Accept* specifies the spectator's belief as to whether the offer will be accepted. WTA is the spectator's incentivized willingness to accept waiting for 1 minute. $Annoyself$ is the self-reported measure of how annoying the waiting time is. Model 1 has the greatest number of observations since $Money$ and *Accept* were not elicited from all the subjects. Models 3, 6, 7, and 9 have fewer observations compared to the other models due to not including the NO INFO treatment. Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 8: Determinants of the likelihood to prohibit transactions with tone in peer pressure treatments: Marginal effects

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Peer Pressure	0.262***	0.243***	0.237**	0.272***	0.224**	0.253***	0.253***
	(0.098)	(0.093)	(0.101)	(0.093)	(0.097)	(0.092)	(0.092)
Accept		-0.176***			-0.167***	-0.133**	-0.133**
		(0.048)			(0.048)	(0.061)	(0.060)
WTA			0.110		0.092		
			(0.068)		(0.066)		
Painself				0.097***		0.064*	0.064*
				(0.030)		(0.037)	(0.037)
Observations	89	89	89	89	89	89	89

Notes: The table reports the marginal effects from logistic regressions where the dependent variable is the binary variable specifying whether the decision maker prohibits the transaction with the tone. $PeerPressure$ is the treatment dummy for the Peer Pressure treatment, where $NoPeerPressure$ is the baseline treatment dummy. *Accept* specifies the spectator's belief as to whether the offer will be accepted. WTA is the spectator's incentivized willingness to accept listening to 1 minute of the tone. $Painself$ is the self-reported painfulness of the tone. Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 9: Determinants of the likelihood to prohibit transactions with waiting time in peer pressure treatments: Marginal effects

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Peer pressure	0.086	0.084	0.079	0.063	0.077	0.063	0.063
	(0.077)	(0.078)	(0.077)	(0.078)	(0.078)	(0.078)	(0.078)
Accept		-0.019			-0.018	0.008	0.014
		(0.045)			(0.047)	(0.053)	(0.056)
WTA			0.079		0.079		
			(0.058)		(0.059)		
Annoyself				0.034		0.035	0.035
				(0.023)		(0.026)	(0.025)
Observations	89	89	89	89	89	89	89

Notes: The table reports the marginal effects from logistic regressions where the dependent variable is the binary variable specifying whether the decision maker prohibits the transaction with the time. $Peerpressure$ is the treatment dummy for the Peer Pressure treatment, where $NoPeerPressure$ is the baseline treatment dummy. *Accept* specifies the spectator's belief as to whether the offer will be accepted. WTA is the spectator's incentivized willingness to accept waiting for 1 minute. $Annoyself$ is the self-reported annoyingness of the waiting time. Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

A.3 Moral foundations questionnaire

In order to measure the moral convictions of our subjects and investigate possible correlations with their choices, we employ the moral foundations questionnare (MFQ). It measures five basic foundations of human morality. Care/harm measures how morally wrong a person thinks it is to harm someone; fairness/cheating measures how morally wrong the person thinks it is to be unfair to someone; loyalty/betrayal measures how morally wrong the person thinks it is to act in a disloyal manner; authority/subversion measures how morally wrong a person thinks it is to disrespect authority; purity/degradation measures how morally wrong a person thinks it is to act in a degrading manner.

Our subjects' mean scores are 21.1 for the harm foundation, 21.7 for the fairness foundation, 15.1 for the loyalty foundation, 13.6 for the authority foundation, and 13.0 for the purity foundation.

Table 10 presents the average MFQ scores of subjects who allow or prohibit the transaction with the tone, and it provides the p-values of the Wilcoxon rank sum tests comparing the two groups. None of the five foundation scores is significantly different for people who prohibit or allow a transaction.

Table 10: MFQ scores of subjects allowing or prohibiting the transaction with the tone

	Allow	Prohibit	Rank-sum (p)
Harm	20.27	21.59	0.06
	(5.35)	*(4.31)*	
Fairness	21.04	22.24	0.16
	(5.39)	*(4.14)*	
Loyalty	15.03	15.39	0.27
	(5.02)	*(4.69)*	
Authority	13.72	13.78	0.79
	(5.12)	*(4.99)*	
Purity	13.08	12.55	0.37
	(5.59)	*(5.06)*	

Notes: The table reports the mean scores of the MFQ foundations for the subjects who allowed or prohibited transactions with tone and waiting time. The last column reports the p-values from the Wilcoxon rank-sum tests of the significance of the differences between the MFQ scores of the subjects who allowed and prohibited a transaction. Standard deviations are in parentheses.

Table 11 reports the linear regression results for the transaction with the tone in the buyer-seller treatments controlling for the MFQ scores. Only the harm and purity scores correlate with the likelihood to prohibit transactions with the tone. In particular, people who find it more morally wrong to harm someone are more likely to prohibit the transaction with the tone. On the other hand, people who find it more morally wrong to behave in a degrading manner are less likely to prohibit the transaction with the tone. Table 12 reports similar regressions for the transaction with the waiting time in the peer pressure treatments where the MFQ harm scores are positively correlated with the likelihood to prohibit. However, the regression results for the transactions with waiting time in the buyer-seller treatments and for the transactions with tone in the peer pressure treatments show no correlation of the MFQ scores with the likelihood to prohibit. Thus, the harm score has some explanatory power but the evidence is not robust across treatments.

Table 11: Moral foundations and the likelihood to prohibit transactions with tone in the buyer-seller treatments

	(1)	(2)	(3)	(4)	(5)	(6)
No agency	0.272***	0.314***			-0.078	
	(0.084)	(0.108)			(0.188)	
No info	0.074	0.105	0.124	0.141	-0.315	-0.237
	(0.085)	(0.094)	(0.090)	(0.087)	(0.197)	(0.270)
Third party	0.367***	0.407***	0.477***	0.509***	-0.027	-0.087
	(0.091)	(0.099)	(0.098)	(0.092)	(0.199)	(0.375)
MFQharm	0.015*	0.019**	0.023**	0.022**	0.015*	0.020**
	(0.008)	(0.009)	(0.010)	(0.009)	(0.008)	(0.009)
MFQfairness	0.009	0.010	0.005	-0.003	0.004	-0.001
	(0.008)	(0.009)	(0.011)	(0.011)	(0.009)	(0.011)
MFQloyalty	0.004	-0.003	0.004	0.010	0.002	0.009
	(0.009)	(0.010)	(0.012)	(0.012)	(0.010)	(0.012)
MFQauthority	0.008	0.010	0.011	0.007	0.006	0.007
	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)
MFQpurity	-0.023***	-0.020**	-0.023**	-0.020*	-0.019**	-0.021**
	(0.008)	(0.009)	(0.010)	(0.010)	(0.008)	(0.010)
Money		0.006	0.009	0.000	-0.073***	-0.049
		(0.014)	(0.016)	(0.016)	(0.026)	(0.030)
Accept			-0.118***	-0.114***		
			(0.044)	(0.043)		
Painself				0.078***	0.086***	0.074***
				(0.023)	(0.022)	(0.024)
Constant	0.012	-0.079	0.088	-0.158	0.020	0.184
	(0.164)	(0.186)	(0.216)	(0.215)	(0.214)	(0.267)
Treatment × Money	No	No	No	No	Yes	Yes
Treatment × Accept	No	No	No	No	No	Yes
Observations	226	179	144	144	179	144
Adjusted R^2	0.120	0.131	0.182	0.238	0.220	0.243

Notes: The table reports the coefficient estimates from linear regressions where the dependent variable is the binary variable specifying whether the decision maker prohibits the transaction with the tone. The $NoAgency$, $NoInfo$ and $ThirdParty$ variables are treatment dummies, where $FullAgency$ is the baseline treatment. $MFQharm$, $MFQfairness$, $MFQloyalty$, $MFQauthority$, and $MFQpurity$ are scores for the foundations of the Moral Foundations Questionnaire. $Money$ specifies the spectator's belief about the amount of money offered by player A, and *Accept* specifies the spectator's belief as to whether the offer will be accepted. $Painself$ is the self-reported painfulness of the tone. Model 1 has the greatest number of observations since $Money$ and *Accept* were not elicited from all the subjects. Models 3, 4, and 6 have fewer observations compared to the other models because treatment No Agency is excluded. Models 5 and 6 control for the interaction of the treatment and $Money$, and Model 6 controls for the interaction of the treatment and *Accept*. Robust standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 12: Moral foundations and the likelihood to prohibit transactions with time in the peer pressure treatments

	(1)	(2)	(3)	(4)
Peer pressure	0.081	0.079	0.060	-0.302
	(0.077)	(0.078)	(0.077)	(0.414)
MFQharm	0.023**	0.023**	0.025**	0.026***
	(0.010)	(0.010)	(0.010)	(0.010)
MFQfair	-0.016	-0.016	-0.015	-0.016
	(0.010)	(0.011)	(0.010)	(0.010)
MFQingroup	0.009	0.009	0.008	0.009
	(0.012)	(0.012)	(0.011)	(0.011)
MFQauthority	0.005	0.005	0.006	0.006
	(0.010)	(0.010)	(0.010)	(0.010)
MFQpure	0.000	0.000	-0.002	-0.003
	(0.010)	(0.010)	(0.009)	(0.009)
Accept		-0.007	0.019	
		(0.054)	(0.061)	
Annoyself			0.043	0.045
			(0.029)	(0.029)
Peer pressure × Accept				0.068
				(0.092)
No peer pressure × Accept				-0.033
				(0.074)
Constant	-0.230	-0.205	-0.436	-0.243
	(0.259)	(0.274)	(0.294)	(0.345)
Observations	89	89	89	89
Adjusted R^2	0.022	0.010	0.029	0.026

Notes: The table reports the coefficient estimates from linear regressions where the dependent variable is the binary variable specifying whether the decision maker prohibits the transaction with the waiting time. $PeerPressure$ is the treatment dummy for the Peer Pressure treatment, where $NoPeerPressure$ is the baseline treatment dummy. $MFQharm$, $MFQfairness$, $MFQloyalty$, $MFQauthority$, and $MFQpurity$ are scores for the foundations of the Moral Foundations Questionnaire. *Accept* specifies the spectator's belief as to whether the offer will be accepted. $Annoyself$ is the self-reported annoyingness of the waiting time. Robust standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

A.4 Instructions

Spectators' instructions for the main part of the experiment consist of three parts: introduction, situations, and your decision. Introduction explains general rules, situations explain the games that will be played between other people, and your decision explains the consequences of their decision. The instructions for the main part of the experiment, for the elicitation of the WTA values, and the consent form are given below.

Introduction (same for all treatments):

Welcome to our decision-making experiment. During the experiment you are not allowed to use electronic devices or to communicate with other participants. Please use only the programs and functions intended for the experiment. Please do not talk to the other participants. If you have a question, please raise your hand. We will then come to you and answer your question in silence. Please do not ask your questions out loud. If the question is relevant for all participants, we will repeat it loudly and answer it. If you violate these rules, we must exclude you from the experiment and the payout.

For your participation, you will be paid a show-up fee of 5 Euros and a participation fee of 7 Euros. In addition, you may receive some additional money based on your choices during the experiment. At the end of the experiment, you will be paid your earnings in cash privately. There are several parts in this experiment. In each part of the experiment you may be asked to make one or more decisions. Decisions that are made in one part of the experiment cannot affect earnings in the other part of the experiment. Please note that your identity will not be revealed to anyone during or after the experiment. Thus, your decisions will be anonymous.

In this part of the experiment, you will read the description of two different experimental situations. After you have read the description, **you will be asked for each of the two situations whether you would like to prohibit a certain transaction. Please note that you will not take part in these situations. The experimental sessions involving these situations will not be held today. Your task will only be to decide**

whether you prohibit the transaction or not in each situation, as explained in more detail below.

Situations

Full agency

There are two different roles in the experiment: Individual A and Individual X. People attending the experiment are randomly assigned to their roles, and they are randomly matched with one other person to form a group of two, where each person has a different role.

Both Individual A and Individual X are endowed with 10 minutes of a negative experience each. In Situation 1, the negative experience is listening to a painful tone (85dB and 2083 Hz) and in Situation 2, the negative experience is waiting in the laboratory. In addition, in both situations, Individual A and Individual X are endowed with 10 Euros each.

Individual A can offer Individual X an amount of money m together with the 10 minutes of the negative experience that he/she is endowed with. Individual A can offer any amount of money m between 1 Euro and 10 Euros (from his/her endowment). After observing the offer of A, Individual X can either accept or reject the offer. If he/she accepts the offer, the transaction takes place and the money and the negative experience are transferred to Individual X. If Individual X rejects the offer, both individuals keep their initial endowments.

Before making their decisions, individuals A and X will be exposed to the negative experience for 1 minute in order to familiarize them with the nature of the negative experience.

If Individual A decides to offer a certain amount m Euros to Individual X together with the negative experience, and if Individual X accepts the offer, the resulting outcome will be the following: Individual A will not be exposed to the experience, and will be endowed with the amount of money of 10-m Euros, Individual X will be exposed to the experience for 20 minutes and will be endowed with the amount of money of m+10 Euros.

If Individual A decides to offer a certain amount m Euros to Individual X together with the negative experience, and if Individual X rejects the offer, the resulting outcome will be the

following: Individual A will be exposed the experience for 10 minutes, and will be endowed with the amount of money of 10 Euros, Individual X will be exposed to the experience for 10 minutes and will be endowed with the amount of money of 10 Euros.

Individuals A and X are not allowed to participate in any activities during the negative experience, e.g., talk, read, sleep, use smartphones, stand up, use the computer, listen to music etc.

No agency

There are two different roles in the experiment: Individual A, and Individual X. People attending the experiment are randomly assigned to their roles, and they are randomly matched with one other person to form a group of two, where each person has a different role.

Both Individual A and Individual X are endowed with 10 minutes of a negative experience each. In Situation 1, the negative experience is listening to a painful tone (85dB and 2083 Hz) and in Situation 2, the negative experience is waiting in the laboratory. In addition, in both situations, Individual A and Individual X are endowed with 10 Euros each.

Individual A can allocate Individual X an amount of money m together with the 10 minutes of the negative experience that he/she is endowed with. Individual A can allocate any amount of money m between 1 Euro and 10 Euros (from his/her endowment).

Before Individual A makes his/her allocation decision, both individuals will be exposed to the negative experience for 1 minute in order to familiarize them with the nature of the experience.

If Individual A decides to allocate a certain amount m Euros to Individual X together with the negative experience, the resulting outcome will be the following: Individual A will not be exposed to the experience, and will be endowed with the amount of money of 10-m Euros, Individual X will be exposed to the experience for 20 minutes and will be endowed with the amount of money of m+10 Euros. Note that Individual X cannot reject Individual A's allocation.

Individuals A and X are not allowed to participate in any activities during the negative experience, e.g., talk, read, sleep, use smartphones, stand up, use the computer, listen to music etc.

No info

There are two different roles in the experiment: Individual A and Individual X. People attending the experiment are randomly assigned to their roles, and they are randomly matched with one other person to form a group of two, where each person has a different role.

Both Individual A and Individual X are endowed with 10 minutes of a negative experience each. In Situation 1, the negative experience is listening to a painful tone (85dB and 2083 Hz) and in Situation 2, the negative experience is waiting in the laboratory. In addition, in both situations, Individual A and Individual X are endowed with 10 Euros each.

Individual A can offer Individual X an amount of money m together with the 10 minutes of the negative experience that he/she is endowed with. Individual A can offer any amount of money m between 1 Euro and 10 Euros (from his/her endowment). After observing the offer of A, Individual X can either accept or reject the offer. If he/she accepts the offer, the transaction takes place and the money and the negative experience are transferred to Individual X. If Individual X rejects the offer, both individuals keep their initial endowments.

Before making his/her decision, individual A will be exposed to the negative experience for 1 minute in order to familiarize himself/herself with the nature of the negative experience. However, individual X will not be exposed to the negative experience for 1 minute before giving his/her decision to accept the offer or not. So, individual X will not know how painful the tone is and how annoying waiting in the laboratory is before giving his/her decision.

If Individual A decides to offer a certain amount m Euros to Individual X together with the negative experience, and if Individual X accepts the offer, the resulting outcome will be the following: Individual A will not be exposed to the experience, and will be endowed

with 10-m Euros, Individual X will be exposed to the experience for 20 minutes and will be endowed with m+10 Euros.

If Individual A decides to offer a certain amount m Euros to Individual X together with the negative experience, and if Individual X rejects the offer, the resulting outcome will be the following: Individual A will be exposed to the experience for 10 minutes, and will be endowed with 10 Euros, Individual X will be exposed to the experience for 10 minutes and will be endowed with 10 Euros.

Individuals A and X are not allowed to participate in any activities during the negative experience, e.g., talk, read, sleep, use smartphones, stand up, use the computer, listen to music etc.

Third Party

There are three different roles in the experiment: Individual A, Individual X and Individual Z. People attending the experiment are randomly assigned to their roles, and they are randomly matched with two other people to form a group of three, where each person has a different role.

Individual A, Individual X and Individual Z are endowed with 10 minutes of a negative experience each. In Situation 1, the negative experience is listening to a painful tone (85dB and 2083 Hz) and in Situation 2, the negative experience is waiting in the laboratory. In addition, in both situations, Individual A, Individual X and Individual Z are endowed with 10 Euros each.

Individual A can offer Individual X an amount of money m together with the 10 minutes of the negative experience that he/she is endowed with. Individual A can offer any amount of money m between 1 Euro and 10 Euros (from his/her endowment). After observing the offer of A, Individual Z can either accept or reject the offer. If Individual Z accepts the offer, the negative experience is transferred to Individual X, and individuals X and Z will share the amount of money offered by Individual A. If Individual Z rejects the offer, everybody keeps his or her initial endowments.

Before making their decisions, individuals A, X and Z will be exposed to the negative experience for 1 minute in order to familiarize them with the nature of the negative experience.

If Individual A decides to offer a certain amount m Euros to Individual X together with the negative experience, and if Individual Z accepts the offer, the resulting outcome will be the following: Individual A will not be exposed to the experience, and will be endowed with 10-m Euros, Individual X will be exposed to the experience for 20 minutes and will be endowed with half of the sum offered by Individual A plus the 10 Euros, that is, (m/2)+10 Euros. Finally, Individual Z will be exposed to the experience for 10 minutes and will be endowed with half of the sum offered by Individual A plus the 10 Euros, that is, (m/2)+10 Euros.

If Individual A decides to offer a certain amount m Euros to Individual X together with the negative experience, and if Individual Z rejects the offer, the resulting outcome will be the following: Individual A will be exposed the experience for 10 minutes, and will be endowed with 10 Euros, Individual X will be exposed to the experience for 10 minutes and will be endowed with 10 Euros, and Individual Z will be exposed to the experience for 10 minutes and will be endowed with 10 Euros.

Individuals A, X, and Z are not allowed to participate in any activities during the negative experience, e.g., talk, read, sleep, use smartphones, stand up, use the computer, listen to music etc.

No peer pressure

There are two different roles in the experiment: Individual A and Individual B. People attending the experiment are randomly assigned to their roles, and they are randomly matched with one other person to form a group of two.

Both Individual A and Individual B are endowed with 10 Euros each. Individuals A and B can earn an additional 5 Euros each by accepting to be exposed to a negative experience for

10 minutes. In Situation 1, the negative experience is listening to a painful tone (85dB and 2083 Hz) and in Situation 2, the negative experience is waiting in the laboratory.

Before making their decisions, individuals A and B will be exposed to the negative experience for 1 minute in order to familiarize them with the nature of the negative experience.

If an individual accepts to go through to the negative experience, he/she will be exposed to it and will be endowed with 15 Euros. If an individual rejects to go through the negative experience, he/she will not be exposed to it and will be endowed with 10 Euros.

Individuals A and B are not allowed to participate in any activities during the negative experience, e.g., talk, read, sleep, use smartphones, stand up, use the computer, listen to music etc.

Peer pressure

There are two different roles in the experiment: Individual A and Individual B. People attending the experiment are randomly assigned to their roles, and they are randomly matched with one other person to form a group of two.

Both Individual A and Individual B are endowed with 10 Euros each. Individuals A and B can earn an additional 5 Euros each by accepting to be exposed to a negative experience for 10 minutes. In Situation 1, the negative experience is listening to a painful tone (85dB and 2083 Hz) and in Situation 2, the negative experience is waiting in the laboratory. If at least one of the individuals accepts to be exposed to the negative experience for money in a given situation, then the other person is forced to be exposed to the negative experience in exchange for 5 Euros independent of choosing otherwise.

Before making their decisions, individuals A and B will be exposed to the negative experience for 1 minute in order to familiarize them with the nature of the negative experience.

If both Individual A and B accept to go through the negative experience, the resulting outcome will be the following: Both individuals will be exposed to the negative experience

for 10 minutes each and both will be endowed with 15 Euros each. If both Individual A and B reject to go through the negative experience, the resulting outcome will be the following: Individuals will not be exposed to the negative experience and both will be endowed with 10 Euros each.

If Individual A accepts and Individual B rejects to be exposed to the negative experience (or similarly, if individual A rejects and individual B accepts), the resulting outcome will be the following: Both individuals will be exposed to the negative experience for 10 minutes each and both will be endowed with 15 Euros each.

Individuals A and B are not allowed to participate in any activities during the negative experience, e.g., talk, read, sleep, use smartphones, stand up, use the computer, listen to music etc.

Your decision (similar for all treatments)

Your task is to decide whether you would like to prohibit the transaction between individuals A and X for each of the two situations. You do not know what the offer of Individual A is when you make your decision. Remember that in Situation 1, individuals A and X are endowed with the painful tone whereas in Situation 2, individuals A and X are endowed with the waiting time. If you choose to prohibit the transaction, it will not be implemented independent of whether Individual X accepted the offer or not, and all individuals will keep their initial endowments.[12]

You can either choose to prohibit the transaction for both situations, or choose to prohibit the transaction for one situation, and not for the other one, or choose not to prohibit the transaction for both situations. Your decision will be implemented in the experimental situations described above with a probability of 10%, that is, in one out of 10 cases.

Before you make your choices, we would like you to answer some questions about the two experimental situations described above. The questions serve to make sure that you understand the experiment well. You cannot proceed to the experiment without answering these

[12]For the third party treatment, this paragraph also talks about individual Z.

questions correctly. After answering the questions, we would like you to listen to the painful tone for one minute and wait for one minute. This will help you to better understand the situations described above.

Please put on your headphones and do not take them off during the experiment. The tone will start playing once everybody has finished answering the questions and has pressed CONTINUE. After the tone, you will experience one minute of waiting time. After experiencing the tone and the waiting time, you will proceed to the screen where you will choose the rules.

WTA value elicitation

Please answer the question below. You can earn money in this task and the exact amount depends on your answer.

Please state the amount of money (in multiples of 50 cents) for which you would be willing to listen to the painful tone for one minute.[13] The amount you state should be between 0 and 2 euros.

As you will see, your best strategy is to determine the minimum amount of money you would be willing to accept in order to listen to the painful tone for one minute and offer that amount. It will not be to your advantage to ask for less than this minimum, and it will not be to your advantage to ask for more. Simply determine the minimum you would be willing to accept and make that amount your bid.

Your bid will be compared to a fixed amount. The fixed amount will be completely unrelated to your bid and to the bids of all other persons in the room.

If your bid is less than or the same as the fixed amount, then you will listen to the painful tone for one minute. But, here?s the interesting part. You do not get the amount you asked for. Instead, you get the fixed amount, that is, an amount equal to or more than your bid.

[13]For the waiting time value elicitation, we confirm the amount of money for which they would be willing to wait for one minute in the laboratory.

Please note that you are not allowed to participate in any activities during the listening period e.g. talk, read, sleep, use smartphones, stand up, use the computer, listen to music etc.

Consent form

You are invited to participate in a study that investigates preferences. In this study, you will be exposed to a 85dB/2083Hz tone during some parts of the experiment. The maximum amount of time you will possibly be exposed to this tone during the experiment is by far within legal bounds for sound exposure in German workplaces. However, to be eligible to take part in this study, you must not be diagnosed with tinnitus or hyperacusis. Moreover, for today, you should not be involved in other activities that would lead to a situation that your total exposure to sounds above 85dB exceeds two hours.

Note that you have the right to leave the experiment at any time if you feel uncomfortable. However, if you decide to leave before the experiment ends, you will only get 5 euros show-up fee.

I have read the foregoing information. I have had the opportunity to ask questions about it and any questions that I have asked have been answered to my satisfaction. I do not suffer from tinnitus or hyperacusis and I consent voluntarily to participate in this research.