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# Generosity and Guilt: The Role of Beliefs and Moral Standards of Others

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## Abstract

Why are people generous? One reason may be to avoid feeling guilt - in terms of failing to meet others' expectations or in terms of failing to meet others' moral standards. The present article reports an experiment using the 'dictator game' while manipulating the dictators' beliefs about the receivers' expectations and moral standards. The results indicate that generosity is indeed driven by guilt-aversion: Dictators are more generous when the receiver expects more, and also when the receiver considers that dictators should, morally speaking, give more. If dictators were motivated by pure altruism or equity concerns, the receiver's expectations or moral beliefs should not matter.

*Keywords:* guilt, dictator game, generosity, disapproval, disappointment, behavioral economics

*JEL:* C91, D03, D63, D64

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## 1. Introduction

Although economic theory assumes selfish behaviour, generous behaviour is widespread. For instance, The World Giving Index published by Charities Aid Foundation estimates that approximately a third of the world's population donated money to charity in 2014 (?). Within experimental economics, the dictator game is commonly used to study generous behaviour. The experimental dictator game is a two person game where the 'dictator' dictates how to share a sum of money with an anonymous 'receiver'. Despite decisions being anonymous with no opportunity for the two players to meet and no opportunity for the receiver to retaliate, typical results show that dictators on average share around 30% of the money with the receiver (Engel, 2011).

But why are people generous? One reason may be to avoid feeling guilt; however, guilt may have different sources. Guilt caused by not living up to the expectations of others has been incorporated into the economic model of guilt aversion (Battigalli & Dufwenberg,

2009)<sup>1</sup>. The guilt aversion model is based on psychological game theory (Geanakoplos et al., 1989). Psychological game theory allows the utility to depend on beliefs (and beliefs about beliefs) in addition to actions as in standard game theory. Intuitively, the guilt aversion model assumes that beliefs influence behaviour because people want to avoid letting others down by not living up to their beliefs. Behaving generously, thus, becomes a means to avoid feeling guilty.

The economics literature on guilt aversion has been inspired by a particular branch of psychological literature. Specifically, the literature on guilt aversion in economics (such as Dufwenberg (2002), Charness & Dufwenberg (2006), ‘simple guilt’ in Battigalli & Dufwenberg (2007)<sup>2</sup> and Battigalli & Dufwenberg (2009)) is inspired by the definition and causes of guilt as presented in Tangney (1995) and Baumeister et al. (1994). Baumeister et al. (1994) write: “In general, if people feel guilty for hurting their partners, for neglecting them, and for failing to live up to their expectations, they will alter their behaviour (to avoid guilt) in ways that seem likely to maintain and strengthen the relationship” (p. 247). From this definition, the economics literature on guilt aversion has mainly focused on failing to live up to the expectations of others as the cause of guilt. Also, Battigalli & Dufwenberg (2007) have included a second cause of guilt where they distinguish between ‘simple guilt’ and ‘guilt from blame’. Simple guilt is defined as guilt caused by not living up to the expectations of others. Guilt from blame is defined as guilt caused when person A believes that person B infers that the outcome (which disappoints person B), was intentionally chosen by person A - that is, when A believes that B believes that A is to blame for person B’s disappointment.

There are still other additional causes of guilt worth studying. For instance, later in the same paper, Baumeister et al. (1994) write: “When people described how others made them feel guilty, they frequently referred to differing expectations and to the other’s standards” (p.248). Thus, if people care about what others think about their behaviour, and fear others will disapprove of their behaviour, the moral standards of others may also influence choices regarding how to behave. A theoretical model that incorporates the dislike of being disapproved of by others can be found in López-Pérez & Vorsatz (2010)<sup>3</sup>.

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<sup>1</sup>See also Battigalli & Dufwenberg (2007). Guilt was introduced in the economics literature for the first time by Dufwenberg (2002).

<sup>2</sup>Battigalli & Dufwenberg (2007) distinguish between ‘simple guilt’ and ‘guilt-from-blame’ as described below.

<sup>3</sup>Models of social esteem are somewhat related. Such models assume that people gain utility from what

This paper will examine whether the two possible causes of guilt - the expectations and moral standards of others - affect generous behaviour in a dictator game. We will refer to guilt caused by not living up to the expectations of others as ‘guilt-from-disappointment’<sup>4</sup> and guilt caused by not living up to the moral standards of others as ‘guilt-from-disapproval’<sup>5</sup>. See Appendix A in the Supplementary Material for a simple theoretical model of guilt-from-disappointment and guilt-from-disapproval.

To study whether the expectations and moral standards of others affect generous behaviour, two treatments are introduced in a dictator game experiment. In the belief treatment, dictators decide how to share a sum of money with an anonymous partner based on the beliefs held by their partner about what dictators on average will share. In the moral standard treatment, dictators decide how to share the sum of money based on what their partner has reported that dictators, morally speaking, should allocate to their partners. This design allows us to study whether the size of dictator allocations depends on the beliefs as well as the moral standards held by the receiving partner.

Several empirical studies suggest a relation between feeling guilty and behaving pro-socially. Bracht & Regner (2013) used psychological scales to measure individuals’ proneness to experiencing guilt and found a positive relationship between proneness to experiencing guilt and pro-social behaviour in a trust game. Also, Gummerum et al. (2010) found that children’s understanding of guilt predicts allocations in a dictator game. While these two studies support a relation between feeling guilty and behaving pro-socially, they do not say what causes the guilt feeling.

One strand of literature studies guilt caused by failing to meet the expectations of others by focusing on the relationship between second-order beliefs and pro-social behaviour. Second-order beliefs are the beliefs person A holds about the beliefs person B holds about person A’s behaviour. First-order beliefs are commonly elicited by asking subjects to guess the choices of others while second-order beliefs are elicited by asking subjects to guess what

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others believe about them, see for instance Ellingsen & Johannesson (2008b) for a theoretical model, and Ellingsen & Johannesson (2007) for a more intuitive account.

<sup>4</sup>Guilt-from-disappointment is in line with the definition of guilt in Battigalli & Dufwenberg (2009), Charness & Dufwenberg (2006), Dufwenberg et al. (2011) and simple guilt in Battigalli & Dufwenberg (2007).

<sup>5</sup>Guilt-from-disapproval resembles, but does not coincide with, guilt from blame in Battigalli & Dufwenberg (2007). Guilt-from-disapproval is related to living up to the moral standards of others while guilt from blame is related to that others’ inferences concerning intentions to disappoint others

others believe about their own behaviour. Positive correlations have been found between second-order beliefs and repaying trusting behaviour in the trust game (Bacharach et al., 2007; Bracht & Regner, 2013; Charness & Dufwenberg, 2006; Dufwenberg & Gneezy, 2000; Guerra & Zizzo, 2004)<sup>6</sup>, and between second-order beliefs and cooperative behaviour in public good games (Dufwenberg et al., 2011) and principal agent games (Falk & Kosfeld, 2006).

A second strand of the literature studying guilt has used the direct response method which communicates the elicited belief of a partner to the decision maker. As pointed out by Ellingsen et al. (2010), a positive correlation between second-order beliefs and behaviour need not be evidence of guilt aversion but can be caused by people falsely believing that the perceptions of others are similar to their own, i.e. the false-consensus effect. To test whether correlations between second-order beliefs and behaviour indeed are driven by the false-consensus effect, Ellingsen et al. (2010) elicited first-order beliefs in dictator and trust games. They elicited the amount receivers expect dictators to allocate in the dictator game, and how much senders expected receivers to repay in trust games. The respective partners received the elicited beliefs prior to making their choices which ensured correct second-order beliefs. Ellingsen et al. (2010) found close to zero correlation between beliefs and behaviour both in the dictator game and the trust game and concluded that a false-consensus effect might cause positive correlations between second-order beliefs and pro-social behaviour. Kawagoe & Narita (2014) have replicated this result in a trust game with pre-play communication. While the evidence of both Ellingsen et al. (2010) and Kawagoe & Narita (2014) do not find support for guilt aversion, two other studies which also use the direct response method do find support for guilt aversion. Bellemare et al. (2011) used the direct response method in their X-treatment, and found a positive willingness to pay to avoid guilt. Also, Reuben et al. (2009), using a within-subject comparison, found that receivers in a trust game matched with high-belief (low belief) senders increased (decrease) the amount sent to the receiver in comparison to a previous trust game decision<sup>7</sup>.

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<sup>6</sup>Positive correlations between second-order beliefs and repaying trust behavior was also found in the S-treatment in Bellemare et al. (2011)

<sup>7</sup>Additionally, in a trust game with communication Vanberg (2008) finds no correlation between the second-order beliefs of the receiver and the amount sent back to the sender when the beliefs of the sender are created by a promise made by someone else.

A third way of studying the relationship between beliefs and behaviour is to use a variant of the strategy method where decisions are elicited for many levels of second-order belief. Using this method has provided evidence supporting guilt aversion both in dictator games (Bellemare et al., 2014; Khalmetski et al., 2015) and trust games (Attanasi et al., 2013). The referred evidence concerning the relationship between beliefs and pro-social behaviour is not ambiguously supportive; but summing up, there seems to be more evidence in favour of than against the hypothesis of guilt from disappointment.

The current paper has several contributions to the literature. First, the belief treatment, studying guilt-from-disappointment, replicates a previous study (Ellingsen et al., 2010) in a new subject pool<sup>8</sup>. Also, there are some differences in the experimental design between Ellingsen et al. (2010) and the design used in this study. While Ellingsen et al. (2010) use the direct response method, this study uses the strategy method to elicit dictator choices for different levels of receiver beliefs. Secondly, the current study presents new empirical evidence by studying guilt-from-disapproval in a dictator game. This paper also contributes to the literature by studying both guilt-from-disappointment and guilt-from-disapproval within the same experiment. The current study therefore provides relevant insight for both guilt-from-disappointment and guilt-from-disapproval.

My main finding is that dictators allocate more to their receiver when the receiver expects to receive more, and also when the receiver considers that dictators, morally speaking, should allocate more to receivers. However, the impacts of expectations and moral standards, respectively, are hard to disentangle in the current experiment.

The remainder of the paper is organized as follows: Section 2 presents the experimental design, Section 3 presents the results and Section 4 concludes.

## 2. Design

### 2.1. Baseline Game

The baseline game was a dictator game (Forsythe et al., 1994; Kahneman et al., 1986) where dictators received an endowment of 120 NOK, and could decide how to split this endowment with a receiver.

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<sup>8</sup>The subjects in this study were University students at a Norwegian University while Ellingsen et al. (2010)'s study was conducted among students at a Business School in Sweden

## *2.2. Measuring Beliefs and Moral Standards*

Receivers answered a survey consisting of two questions. The receivers answered these two questions after the general instructions about the dictator game were read, but before learning what role they would have in the dictator game. Receivers were asked to guess how much on average dictators would give to their partners, and how much they considered that dictators, morally speaking, should give to their partners.

For both questions, receivers reported an integer between 0 and 120 NOK. All receivers answered these two questions in the same order: beliefs followed by moral standards. Answering the two questions in the same order could, potentially, result in an order effect for the reported moral standards. However, such a potential order effect is unlikely to influence the outcome variable of the experiment (dictator allocations) for two reasons. First, dictators did not know in which order the receivers reported beliefs and moral standards in, and secondly, as described in detail below, dictator allocations were elicited using the strategy method.

To stay close to the design of Ellingsen et al. (2010), the best guess, i.e. the guess closest to the actual average dictator allocation, was rewarded with 100 NOK. Rewarding the best guess gave receivers an incentive to make an effort in providing their best guess. However, views concerning morally appropriate behaviour in dictator game experiments differs (Cappelen et al., 2007). Therefore, it is not likely that providing an incentive linked to which moral standard receivers reported would induce subjects to reveal their moral standard more truthfully. All receivers were therefore paid 50 NOK for reporting their moral standard. Paying a fixed amount for reporting moral standards hopefully ensured that the receivers gave thought to the question. This fixed payment was also equivalent to the show-up fee received by dictators. A possible concern related to the incentives given to receivers is that reporting moral standards is given a higher incentive in expected terms in comparison to reporting beliefs. As the incentive given for reporting moral standards is unrelated to the question, this incentive should not distort the reported moral standards in any systematic direction. The incentive provided for reporting beliefs, however, does incentivize reporting correct beliefs. It could still be that the incentive given for reporting beliefs was too weak, with the possible caveat that the reported beliefs give a less precise estimate of actual beliefs than would be the case with a higher incentive.

### 2.3. Treatment Manipulations

A structured questionnaire based on the strategy method (Selten, 1967) was used to study whether generosity depends on the expectations and moral standards of the receiver. Conditioning dictator allocations on the receiver's 121 different choice alternatives would be a difficult, time-consuming and, perhaps, boring task. To ensure as truthful and realistic answers as possible, and to avoid answers influenced by boredom, instead only three alternatives were used for the conditional questions.

In the *belief treatment*, each dictator was presented with three decisions, for three levels of first-order beliefs of their receiver.

- “In case your partner has guessed that members of group A, on average, will give nothing, how do you want to share the money between yourself and your partner?”
- “In case your partner has guessed that members of group A, on average, will give something but less than 50%, how do you want to share the money between yourself and your partner?”
- “In case your partner has guessed that members of group A, on average, will give 50%, how do you want to share the money between yourself and your partner?”

In the *moral standard treatment*, each dictator was presented with three decisions, for three levels of the moral standards of their receiver.

- “In case your partner has reported that the morally right thing for a member of group A to give is nothing, how much will you give your partner?”
- “In case your partner has reported that the morally right thing for a member of group A to give is something, but less than 50%, how much will you give your partner?”
- “In case your partner has reported that the morally right thing for a member of group A to give is 50%, how much will you give your partner?”

In both treatments, the three decisions appeared on the same computer screen in random order. Having all three decisions on the same computer screen allowed subjects to go back and forth between the three decisions before proceeding with the experiment. Dictators were

informed that receivers reported their beliefs and moral standards before being assigned the role as receivers in the experiment.

The structured questionnaire divided beliefs and moral standards of receivers into three stepwise intervals; it was, therefore, simpler and more limited than structured questionnaires used in related papers (Attanasi et al., 2013; Bellemare et al., 2014; Khalmetski et al., 2015). The advantage of using so few subsets is that it is simpler for the dictators to make their decisions, as they have to consider fewer alternatives. The disadvantage is that the mapping from beliefs to allocations is less precise. Nevertheless, the three categories represent three stepwise categories of beliefs and moral standards respectively which are increasing in size. Allocations increasing in the three levels of beliefs indicate support for guilt-from-disappointment while allocations increasing in the three levels of moral standards indicate support for guilt-from-disapproval.

A possible concern with the three categories of beliefs that dictator allocations were conditioned on, is that they do not cover beliefs of dictators giving away more than 50% of the endowment. As allocations above 50% are rare in dictator game experiments (Engel, 2011), we did not expect that beliefs concerning average allocations above 50% would occur. To include all possible beliefs about average allocations, the description of the highest category in the instructions should have been “50% *or more*”<sup>9</sup>. Given that allocations above 50% are uncommon, it is less likely that dictators believed that receivers would guess that dictators on average gave away more than half. Secondly, there were no questions raised by participants in the experiment concerning the possible levels of receiver’s beliefs, which at least can indicate that it was not a major problem. Third, dictators were given 60 seconds to make their allocation decisions conditioned on receiver beliefs. Within this short time frame, it is less likely that dictators reflected on beliefs other than those provided. Finally, if dictators nevertheless were affected by this, using the strategy method for eliciting dictator allocations implies that regardless of the dictators’ own second order beliefs, their allocation decisions were made for various possible levels of beliefs held by the receiver. Therefore the comparison of conditional allocations still should be valid as it gives an indication of whether dictator allocations differ according to the receiver’s beliefs.

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<sup>9</sup>The ztree-program did include beliefs above 50% in the highest category, so payments from the experiment were defined for all possible beliefs.

The same concern can be raised regarding the categories of moral standards that dictator allocations were conditioned on. As the strategy method was used also for allocations conditioned on moral standards, also the comparison of allocations conditioned on the different levels of moral standards should give an indication of whether dictator allocations differ according to the receiver’s moral standard.

#### *2.4. Procedure and Sample*

Subjects were recruited among students at the University of Oslo. A total of 100 subjects participated in the experiment, across five sessions. Half of the subjects played the role of dictators and the other half as receivers.

The experiment was conducted in a computer lab and programmed with ztree (Fischbacher, 2007). The complete instructions used in the experiment are provided in Appendix B in the Supplementary Material. All decisions were anonymous with respect to the other participants and the experimenters. Participants were randomly assigned the role of dictator or receiver. Each dictator and each receiver participated in three dictator games: one baseline game, one belief treatment and one moral standard treatment. All dictators participated in the base treatment as the first dictator game, while half of the dictators participated in the belief treatment as the second game and the moral standard treatment as the third game. For the other half of dictators, the order of the two last games was reversed. In each dictator game dictators received an endowment of 120 NOK and were randomly assigned a new receiver for each treatment.

No feedback was given before all decisions were completed. Subjects were paid the sum of the payoff from each of the three dictator games. In the belief treatment, the payoff was determined by the dictator’s choice corresponding to the receiver’s belief. In the moral standard treatment the payoff was determined by the dictator’s choice corresponding to the receiver’s moral standard.

### **3. Results**

In the baseline unconditional dictator allocation decision, dictators on average shared 40.7% of their endowment with their receiver. The distribution of allocations showed the regular two-humped shape around sharing equally and keeping all (Engel, 2011), with 58% of dictators dividing equally (giving away 60 NOK) and 12% keeping all (giving away 0

NOK and keeping 120 NOK). In total 24% gave away positive amounts less than half (4% gave away 20 NOK, 4% gave away 30 NOK, 6% gave away 40 NOK and 10% gave away 50 NOK). The remaining 6% of the dictators gave away more than half of the endowment (2% gave away 70 NOK and 4% gave away 80 NOK). (This is more generous than what has been typically observed in previous dictator games in Western countries (Engel, 2011), but similar to what is observed in previous experiments with similar subjects (Hauge et al., 2015).

Since each dictator makes several allocation decisions, order effects are a possible concern. Tests of order effects have been conducted, but no order effects were found. Test statistics for order effects are provided in Appendix C in the Supplementary Material.

### *3.1. Receiver Beliefs and Moral Standards*

On average, the receivers guessed that dictators would give away 38% of their endowment. Keeping in mind that dictators on average gave away 40.7% of their endowment, receivers were, on average, quite good at estimating dictator allocations. 22% of the receivers guessed that dictators would give away half of the endowment, but otherwise, receivers report a large variation in their beliefs, as can be seen from the cumulative distribution of beliefs presented in Figure 1.

[Insert Figure 1 about here. Caption: Cumulative distribution of receiver beliefs and moral standards from an endowment of 120 NOK]

The receivers agreed more on what dictators, morally speaking, should give to receivers. A total of 76% of the receivers reported a moral standard of sharing equally. On average, receivers reported that dictators should give away 45.5% of the endowment. The cumulative distribution of moral standards is presented in Figure 1. As the figure illustrates, receivers report a larger variation in guesses than in moral standards.

### *3.2. Generosity and Beliefs*

Guilt-from-disappointment postulates that dictators should be more generous when (they believe) receivers expect higher allocations<sup>10</sup>. Both Ellingsen et al. (2010)<sup>11</sup> and Khalmetski et al. (2015)<sup>12</sup> found no correlation between receivers' guesses and dictator actual allocations.

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<sup>10</sup>See Appendix A in the Supplementary Material for a theoretical model of guilt-from-disappointment, predictions and a testable hypothesis.

<sup>11</sup>Pearson correlation coefficient of -0.075,  $p=0.497$ .

<sup>12</sup>Pearson correlation coefficient of -0.017,  $p=0.821$ . They did, however, find both positive and negative correlations in their within-subject analysis.

Table 1: Descriptive statistics of dictator allocations

	mean	median	sd	N	#0	# 60
Low belief	29.74	30	26.06335	50	16	17
Medium belief	39.48	50	22.38826	50	8	17
High belief	46.88	60	21.75151	50	7	33
Low moral standard	23.4	10	26.31132	50	24	13
Medium moral standard	36.4	40	21.73683	50	9	13
High moral standard	48.1	60	20.62518	50	6	33

Note: #0 represents the number of subjects with allocations equal to 0 NOK. #60 is the number of subjects with allocation equal to 60 NOK.

In this experiment the correlation between receivers' guesses and dictators' actually realized allocations also was not significantly different from zero (Pearson correlation coefficient of -0.0318,  $p=0.8265$ ).

In the experiment, however, dictator allocations were made conditional on three levels of the partner's beliefs, allowing for a within-subject analysis. Let *Low beliefs* be a dummy variable equal to one if the dictator's choice is made conditional on the receiver's belief that dictators would give nothing; *Medium beliefs* be a dummy variable equal to one if the dictator's choice is made conditional on the receiver's belief that the dictators would give something, but less than half, and *High beliefs* be a dummy variable equal to one if the dictator's choice is made conditional on the receiver's belief that dictators will share equally.

To support guilt-from-disappointment, allocations conditional on *High beliefs* must be higher than allocations conditional on *Medium beliefs*, and allocations conditional on *Medium beliefs* must be higher than those conditional on *Low beliefs*. Table 1 presents descriptive statistics for the dictator allocation conditional on beliefs. Indeed, dictator allocations on average were higher for the higher levels of receiver beliefs.

An OLS-regression of dictator allocations conditional on beliefs can test whether the allocations were significantly higher for higher levels of beliefs. As each dictator made several allocation choices, the regressions with clustered errors on the individual level, allows for correlations between each dictator's three choices. Dictator allocations are regressed on the allocation in the baseline treatment and the dummy variables for *Medium beliefs* and *High beliefs*.

Table 2 shows that dictator allocations were significantly higher when conditional on *Medium beliefs* and *High beliefs* compared to allocations conditional on *Low beliefs*, as can be

Table 2: Regression of dictator allocations conditional on beliefs

	(1)	(2)
	All choices	First choices
Base allocation	0.706*** (12.89)	0.785*** (14.50)
Medium belief	9.740*** (3.13)	10.00** (2.53)
High belief	17.14*** (4.58)	15.60*** (3.18)
Constant	-4.695 (-1.40)	-6.589* (-1.93)
Cluster		
N	150	75
R2	0.471	0.625

Note:  $t$  statistics in parentheses. \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

seen from the positive and significant coefficients of the dummy variables *Medium beliefs* and *High beliefs*. Also, the coefficients of *Medium beliefs* and *High beliefs* are significantly different from each other (F-test,  $p=.023$ ). Overall, we observe that dictators were more generous when receivers expected to receive more. This result supports guilt-from-disappointment.

It is possible to test whether making multiple dictator decisions is driving the results by concentrating on the first choices made by each dictator in the current experiment. In Table 2, specification (2) considers only allocations conditional on beliefs made as the first conditional choice. By concentrating on this subsample, the sample size drops to half (the other half of the dictators made allocations conditional on moral standards as their first conditional choice). Still, the results hold; dictator allocations are significantly higher for higher receiver beliefs.

As previous studies on guilt aversion inducing second-order beliefs (Ellingsen et al., 2010; Khalmetski et al., 2015), this study thus finds no correlation between realized dictator allocations for actual receiver beliefs. And, like other studies testing guilt aversion using the strategy method (Attanasi et al., 2013; Bellemare et al., 2014), the current study finds that dictator allocation are significantly higher when conditioned on higher receiver beliefs. This finding is in line with Khalmetski et al. (2015) who also found no correlation between the actual belief of the receiver and realized dictator allocations, while they found both positive and negative correlations in within-subject analysis of dictator allocations made conditional on the receiver's potential beliefs.

Table 3: Regression of dictator allocations conditional on moral standards

	(1)	(2)
	All choices	First choices
Base allocation	0.665*** (13.43)	0.627*** (7.19)
Medium moral standard	13.00*** (4.45)	12.80*** (2.91)
High moral standard	24.70*** (6.37)	22.60*** (4.14)
Constant	-9.075*** (-3.15)	-3.341 (-0.64)
Cluster		
N	150	75
R2	0.491	0.460

Note:  $t$  statistics in parentheses. \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

### 3.3. Generosity and Moral Standards

If guilt arises when behaviour fails to meet the moral standards of others and people act generously to avoid feeling guilt, we should expect behaviour to be more generous when the moral standards of others demand more generous behaviour<sup>13</sup>. From the experiment we have observed dictator allocations conditioned on three levels of the receivers' moral standards: conditioned on the receiver reporting a moral standard of giving nothing, conditioned on the receiver reporting a moral standard of giving something but less than half, and conditioned on the receiver reporting a moral standard of giving away half (or more) of the endowment. Let *Low moral standard* be a dummy variable equal to one if the dictator's choice is made conditional on the receiver's moral standard being to give nothing; *Medium moral standard* be a dummy variable equal to one if the dictator's choice is made conditional on the receiver's moral standard being to give a way something but less than half, and *High moral standard* be a dummy variable equal to one if the dictator's choice is made conditional on the receiver's moral standard being to give away half (or more). As can be seen from Table 1, dictator allocations on average were lowest when conditional on *Low moral standards* and highest when conditional on *High moral standards*.

Table 3 reports an OLS regression with clustered errors on the individual level, testing

<sup>13</sup>See Appendix A in the Supplementary Material for a theoretical model of guilt-from-disapproval, predictions and a testable hypothesis.

whether allocations were significantly higher for higher moral standards. The main explanatory variables are dummy variables for Medium moral standards and High moral standard. As reported in Table 3, dictators' allocations were significantly higher when conditioned on both *Medium moral standards* and *High moral standards*, in comparison to *Low moral standards*. Also, the coefficients of *Medium moral standards* and *High moral standards* are significantly different from each other (F-test,  $p < .001$ ). Taken together, we therefore observe that dictators are more generous when confronting a higher moral standard from their receiver. This result supports guilt-from-disapproval, in which people behave generously to avoid feeling guilt in terms of failing to meet others' moral standards.

This result is in line with results from several studies illustrating that people care about being approved of by others and that such approval matters for behaviour. For instance, in a public good game experiment, contributions increased when subjects had to announce their contribution decision in front of the other participants (Rege & Telle, 2004). When others can observe the decision they are in a position where they can approve or disapprove of the decision maker's behaviour. The authors interpret this as evidence that people seek approval by others, and, therefore, behave better (here that means contributing more to the public good) when being observed by others. Also, in dictator games, open-form messages from receivers to dictators increase dictator allocations (Ellingsen & Johannesson, 2008a; Xiao & Hauser, 2009); in a prisoner's dilemma game, messages of approval or disapproval increase cooperation (López-Pérez & Vorsatz, 2010) and introducing disapproval points in the Voluntary Contribution Mechanism increases contributions (Maslet et al., 2003; Nussair & Tucker, 2005). Field experiments in social psychology have shown that the decision makers' belief of what others approve or disapprove of (i.e. injunctive norms) are more important for behaviour than norms describing how people commonly behave (i.e. descriptive norms) (Cialdini et al., 1990; Reno et al., 1993). Finally, in a trust game, Andrighetto et al. (2015) use a clever design to disentangle whether social norm compliance is driven by others' empirical or normative expectations. When there is no possibilities of being sanctioned by others, they find that social norm compliance is driven by normative expectations of others.

## 4. Concluding Discussion

The present paper has presented an experimental study of both guilt-from-disappointment and guilt-from-disapproval in a dictator game. The former arises when the dictator thinks that the receiver feels let down by the dictator's chosen allocation while the latter arises when the dictator believes that his/her chosen allocation is morally inappropriate in the eyes of the receiver.

Guilt-from-disappointment and guilt-from-disapproval have been studied in a dictator game experiment where the dictator's beliefs about the receiver's expectations and moral standards were manipulated. The main results have been as follows: first, dictator allocations were higher for higher receiver expectations. Dictator behaviour was consistent with guilt-from-disappointment as outlined in the guilt aversion model in Battigalli & Dufwenberg (2009). Second, dictator allocations were higher when the receiver perceived it to be morally appropriate for dictators to share a high amount compared to when the receiver perceived it to be morally appropriate for dictators to share a small amount. This behaviour is consistent with disapproval aversion as outlined in Appendix A in the Supplementary Material, as well as in López-Pérez & Vorsatz (2010).

The belief treatments of the current experiment was a replication of Ellingsen et al. (2010). As in Ellingsen et al. (2010), and in Khalmetski et al. (2015)'s replication of Ellingsen et al.'s study, there is no significant correlation between receiver beliefs and actually realized dictator allocations in the current experiment. However, the within-subject analysis of allocations conditioned on beliefs, provides evidence in favour of guilt-from-disappointment as dictator allocations are significantly higher when conditioned on higher receiver beliefs.

Economic models explaining generous behaviour with altruistic concerns (Andreoni, 1990) or equity concerns (Bolton & Ockenfels, 2000; Fehr & Schmidt, 1999) cannot account for the behaviour observed in this experiment. For instance, Fehr & Schmidt (1999)'s model of inequity aversion assumes that agents dislike unequal outcomes. According to the model of inequity aversion, what matters for the dictator in the dictator game is the payoff distribution between the dictator and the receiver, while beliefs about the receiver are irrelevant. The inequity aversion model would, therefore, predict that each dictator would allocate the same amount to the receiver across different beliefs about the receiver's beliefs and across different beliefs about the receiver's moral standards.

Models based on psychological game theory can account for the behaviour observed in the current experiment. As indicated by Battigalli & Dufwenberg (2007), in psychological game theory utility of agents depend on beliefs about choices, as well as states of nature or others' beliefs. The guilt aversion model, as outlined in Battigalli & Dufwenberg (2009), is an example of a model where the utility of agents depends on beliefs about others' beliefs about choices (this corresponds to what has been called guilt-from-disappointment in this paper). If one regards the different moral standards of the receiver as different states of nature, also guilt-from-disapproval can be modelled as a belief-dependent motivation.

Understanding the mechanisms behind the generous behaviour is important for developing better models for predicting behaviour as well as for developing behavioural policy. For instance, the insights from this paper can be relevant for charity organizations wanting to increase donations, and for the design of work incentives related to unenforceable contracts. When individual work effort is unobservable, the work structure has similarities with public goods. A workplace where workers falsely believe that the other coworkers have low moral standards related to shirking could potentially reduce shirking by ascertaining and informing about actual moral standards.

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