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Abstract

We explore how risk preferences affect pro-social behavior in risky environments. We analyze a modified dictator game in which the dictator could, by reducing her own sure payoff, increase the odds that an unknown recipient wins a lottery. We first augment a standard social preferences model with reference-dependent risk attitudes and then test the model's predictions for the dictator's giving behavior using a laboratory experiment. As predicted by the model, giving behavior in the experiment is affected by the baseline risk faced by the recipient, the effectiveness of transfers in reducing baseline risk, and the dictator's degree of loss aversion. (JEL Codes: C91, D81, D91)

Keywords: other-regarding preferences; pro-social behavior; reference-dependent preferences; risk

1 Introduction

Opportunities for pro-social behavior often arise within risky environments. As an example, consider the situation of a teacher choosing whether to expend time and energy to provide extra help to a struggling student. On the one hand, by helping the student, the teacher

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incurs a *certain* cost in terms of her forgone free time. On the other hand, the benefit to the student is uncertain: the teacher is only able to improve the student's *chances* of a successful outcome. Similar situations are common: physicians performing risky operations for patients, parents making risky investments in their children, and charitable donors facing uncertainty over whether their funds will reach their intended recipients. In this paper, we are concerned with how this type of social decision is impacted by the nature of the risk faced by the recipient as well as the decision-maker's risk preferences.

A large body of experimental research studies pro-social behavior in settings without risk. This research has largely concentrated on distinguishing among different motives for behaving pro-socially, and in particular on differentiating between concerns for efficiency versus concerns for equity (Fehr and Schmidt 1999; Bolton and Ockenfels 2000; Andreoni and Miller 2002; Charness and Rabin 2002; Engelmann and Strobel 2004; Bolton and Ockenfels 2006; Fehr, Naef, and Schmidt 2006; Engelmann and Strobel 2006; Fisman, Kariv, and Markovits 2007). These papers have identified considerable heterogeneity in motives for giving across experimental subjects, with varying degrees of support for both types of concerns, and have also shown that giving behavior is generally consistent with utility maximization. However, because the majority of these studies have been conducted in settings without risk, still not much is known about how their conclusions translate to risky environments.

A relatively small but growing literature takes up the issue of pro-social behavior under risk. The majority of studies in this area have concentrated on how concerns for fairness extend to risky settings and, in particular, whether pro-social individuals place more weight on ex-ante (chances) or ex-post (outcomes) notions of fairness.[1] Early research in this area showed that individuals are more willing to accept unfair outcomes brought about by an unbiased random mechanism than another player, suggesting preferences for "procedural fairness" (Bolton, Brandts, and Ockenfels 2005). More recently, studies have tried to disentangle ex-ante and ex-post motives in two types of settings. A few studies have examined situations where one or more players face risk that can be redistributed among them ex-ante (Karni, Salmon, and Sopher 2008; Krawczyk and Le Lec 2010; Brock, Lange, and Ozbay 2013; Freundt and Lange 2017). Another type of study considers settings with opportunities for individual risk-taking followed by ex-post redistribution of payoffs among the players (Cappelen et al. 2013). In general, both types of studies indicate that both ex-ante and ex-post fairness concerns are important for rationalizing the data, though whether this has been

[1] There are a few notable exceptions to this generalization about the literature in which risk plays a somewhat different role. Some research shows how players can use risk to disguise their actions and thereby hide their selfish behavior (Andreoni and Bernheim 2009). Several studies indicate that individuals prefer to take on risk that is due to nature rather than risk due to the actions of another player, suggesting an aversion to betrayal (Bohnet and Zeckhauser 2004; Bohnet, Greig, Herrmann, and Zeckhauser 2008).

demonstrated conclusively remains contested (Krawczyk and Le Lec 2016; Brock, Lange, and Ozbay 2016).

A limitation of the studies above is that they tend to abstract from other potentially important determinants of pro-social behavior under risk. Some of these factors, such as the risk attitudes of the players, may indeed be important for interpreting the results in these studies, a point illustrated by the recent back-and-forth between Krawczyk and Le Lec (2016) and Brock, Lange, and Ozbay (2016) concerning the not-so-straightforward implications of risk aversion in pro-social settings.

Yet, to our knowledge, only four empirical studies have examined the link between individual risk preferences and pro-social behavior. Bolton and Ockenfels (2010) found that individuals are more risk-averse when taking risks on behalf of others, indicating that individuals take into account the risks faced by others in pro-social settings. By contrast, the results from two earlier studies (Brennan, González, Güth, and Levati 2008; Güth, Levati, and Ploner 2008) suggest that while players care about their own risks, they do not appear to respond to risks faced by others. Most recently, in a setting similar to our own, Freundt and Lange (2017) found that risk preferences do appear to matter for giving behavior. Independent of our study, they showed that a giver's risk preferences can help explain differences in giving behavior between deterministic and risky versions of the standard dictator game observed by Brock, Lange, and Ozbay (2013).

Despite the obvious importance of the connection between risk attitudes and pro-social behavior, the limited evidence available remains inconclusive. Moreover, the existing literature is largely silent on the mechanism behind this connection. Our aim in this paper is to help clarify this relationship.

In this paper, we provide an initial characterization of how a decision-maker's risk preferences interact with her other-regarding preferences to affect her pro-social behavior in risky environments. We analyze a modified dictator game in which the giver can forgo part of her sure monetary payoff to increase the chances that an anonymous recipient wins a lottery. We consider situations in which the giver knows the risk faced by the recipient but does not know the recipient's risk preferences. Given this lack of information on preferences, our basic premise is that the giver projects her own risk preferences onto the recipient when deciding how much to give. We evaluate how giving in these situations is affected by the nature of the risk faced by the recipient and the giver's risk attitudes. With regard to risk attitudes, we concentrate on the giver's loss aversion.[2]

[2] A growing literature has documented the importance of reference-dependent preferences for rationalizing experimental anomalies and non-standard behavior across a variety of domains. For an excellent summary of recent work, see Sprenger (2015). We emphasize loss aversion rather than the diminishing marginal utility of wealth because the stakes in our setting are small, and therefore the latter factor should not play a role

Our first contribution is to embed a model of reference-dependent risk attitudes (Kőszegi and Rabin 2007) into a set of standard social preferences models and to derive testable implications for the dictator's giving behavior. In the augmented models, the dictator evaluates both her own payoff and the recipient's risky payoff relative to a reference point. A strength of our approach is its generality. The theoretical results we derive are robust across numerous different motives for giving (extended to situations with risk following Fudenberg and Levine [2012]): inequality aversion (Fehr and Schmidt 1999; Bolton and Ockenfels 2000), efficiency ("utilitarianism," or total surplus maximizing), social-welfare or quasi-maximin (Charness and Rabin 2002), and egocentric altruism (Cox, Friedman, and Gjerstad 2007); in addition, the predictions hold regardless of whether decision-makers evaluate utilities ex-ante, ex-post, or both.[3,4]

Our second contribution is to test the predictions of these augmented social preferences models using data collected from a laboratory experiment. Our primary experimental tasks are a series of modified dictator games in which a dictator can allocate tokens to an anonymous recipient in order to increase the chances that the recipient wins a lottery. The dictator herself faces no risk. This intentionally simple design is intended to enhance the salience of the risks faced by the recipient and lessen the potential for "cognitive crowd-out" to lead givers to ignore risks faced by recipients, as may have occurred in previous work (Brennan, González, Güth, and Levati 2008; Güth, Levati, and Ploner 2008).[5]

(Rabin 2000; Rabin and Thaler 2001; Kőszegi and Rabin 2007). In our theoretical and (to a somewhat lesser extent) empirical work, we also account for the role of non-linear probability weighting, another important component of risk attitudes.

[3]The theoretical predictions (with exceptions discussed in the text) also hold irrespective of which particular reference points the dictator evaluates her and the recipient's payoffs against. This is out of necessity, for in general, we are not able to identify the reference points used by the dictator with our data.

[4]While the focus of our paper is on other-regarding preferences and how these interact with risk preferences to determine giving behavior, the literature has identified other motives for pro-social behavior. Examples include "warm-glow" preferences for giving (Andreoni 1990), social norms, and preferences for not appearing selfish (Dana, Cain, and Dawes 2006; Dana, Weber, and Kuang 2007; Andreoni and Bernheim 2009). In Appendix D, we explore how various alternative types of giving motives might have affected giving in our setting.

[5]In order to highlight the connection between risk, risk preferences, and giving, we take additional steps to remove other confounds. First, we eliminate the possibility that a dictator can exploit "moral wiggle room" (Dana, Weber, and Kuang 2007) or "hide" her selfishness behind risk (Andreoni and Bernheim 2009) by ensuring that a dictator's choices are fully transparent to the recipient. Second, as it has been shown that individuals may use risk as an excuse not to give (Exley 2016), we elicit measures of this tendency and control for them in our empirical analyses. Third, to eliminate the influence of strategy and reciprocity, the recipients in our dictator games are passive players. This differentiates our work from recent experimental studies on the effects of recipients' perceptions of fairness in similar games (Bolton, Brandts, and Ockenfels 2005; Falk, Fehr, and Fischbacher 2008). The absence of strategic interactions also distinguishes our paper from a set of experimental studies that have examined how contributions to public goods are affected by inequality aversion (Teyssier 2012), conditional cooperation (Fischbacher and Gächter 2010), strategic uncertainty (Offerman, Sonnemans, and Schram 1996; Fischbacher and Gächter 2010; Teyssier 2012; Kocher et al. 2015; Cárdenas et al. 2017), and natural risk that impacts the return to the public good (Cárdenas et al. 2017).

We focus exclusively on giving behavior that occurs before the resolution of risk. This differentiates our work from the research on ex-post income redistribution—both the work on fairness concerns (e.g., Cappelen et al. [2013]) and the extensive literature on risk sharing.[6] To our knowledge, only four papers have studied dictator games which incorporate the type of ex-ante redistribution we analyze: Karni, Salmon, and Sopher (2008); Krawczyk and Le Lec (2010); Brock, Lange, and Ozbay (2013); and Freundt and Lange (2017). Our experimental setup is very similar to the design in the latter three papers, which also study two-person games. In contrast to all of these studies, we focus on situations in which behavior is largely unaffected by the giver's precise fairness motive. By abstracting from the distinction between ex-ante and ex-post fairness concerns, we are able to highlight the importance of other determinants of giving.

To examine how the nature of the risk faced by the recipient impacts giving, we vary three features of the decision environment: the baseline risk faced by the recipient, the effectiveness of giving in reducing baseline risk, and the experimental endowment of the recipient. Our use of variation in the first two parameters resembles the approach taken by Andreoni and Miller (2002) and Fisman, Kariv, and Markovits (2007). Those papers analyzed pro-social behavior in a dictator game through the lens of traditional consumer theory and used variation in a dictator's budget set to test the axioms of revealed preference. Despite the similarities, because our setting involves risk, it is not obvious whether or how their conclusions or consistency tests can be extrapolated to our environment.

In our analysis of the experimental data, we exploit two approaches. First, because each dictator faces a series of dictator game tasks, we utilize a within-subjects design to examine how variation in baseline risk and the effectiveness of giving affects the allocation of tokens. We use the observed variation in giving behavior across tasks to empirically test the comparative statics of our augmented social preferences models. Second, to test for the effect of risk attitudes, we combine the experimental data from the dictator tasks with data from an additional suite of tasks that elicit measures of loss aversion, probability weighting, and other-regarding preferences, and use a between-subjects design, comparing giving behavior across dictators who exhibit varying degrees of loss aversion. This approach allows us to more cleanly identify the separate effects of risk preferences and other-regarding preferences on giving behavior than was possible in earlier studies.

Our results are broadly supportive of our augmented social preferences models. Most significantly, we find that a dictator's degree of loss aversion is a significant determinant of giving behavior and, consistent with the predictions of the models, that the effect of

[6]For a theoretical study that tackles the interplay between inequality aversion and risk aversion at the household level in a standard risk sharing problem, see Chambers (2012).

loss aversion is mediated by the degree of inequality aversion. In particular, while loss aversion reduces the probability of giving for more inequality-tolerant dictators, among more inequality-averse dictators, we observe that those who are more loss averse are more likely to give. As noted, this relationship between loss aversion and giving is robust across a broad array of standard models of other-regarding preferences.

Our empirical results also show the importance of incorporating non-linearities into the theoretical framework, as we are able to reject the implications of linear versions of the models without probability weighting and in which the recipient's individual felicity enters a giver's utility function linearly.

Finally, we provide some limited evidence on whether it is possible to experimentally manipulate reference points to affect a dictator's pro-social behavior. We attempted to do this by varying recipients' experimental endowments across experimental conditions. However, we found no differences in giving behavior across these conditions, suggesting that our manipulation did not achieve the desired effect. We return to this point in the conclusion.

The rest of the paper is organized as follows. Section 2 develops the theory and lays out the propositions to be tested empirically. Section 3 describes the experimental design. Section 4 provides an overview of the empirical analyses and discusses the results. A final section concludes. Derivations of all testable implications as well as an array of robustness checks and supplemental analyses are contained in the appendices.

2 Theoretical framework

2.1 The dictator game with risky outcomes

We analyze a dictator game with risky outcomes that builds on some of the dictator games introduced by Brock, Lange, and Ozbay (2013) (see the description of their Tasks 2 and 3, p. 422). The dictator is endowed with 20,000 Colombian pesos (COP). The recipient is endowed with either 0 COP or 20,000 COP. In addition, there is a pool of twenty tokens that the dictator can divide between herself and the recipient. The dictator decides how many tokens $x \in [0, 20]$ to give to the recipient and takes the remaining tokens for herself. Every token the dictator takes for herself is worth 500 COP. By contrast, the recipient faces a lottery; the tokens allocated to the recipient represent *lottery tickets*. If the recipient is endowed with 20,000 COP, she keeps her endowment if she wins the lottery and loses her endowment (i.e., ends up with 0 COP) if she fails to win. If, instead, the recipient is endowed with 0 COP, she receives 20,000 COP if she wins the lottery and does not receive anything if she fails to win.

The recipient starts the game with p out of one hundred available lottery tickets ($0 \leq p < 100$). Thus, $\frac{p}{100}$ represents the *baseline winning probability.* The value of p is common knowledge. By allocating tokens to the recipient, the dictator increases the recipient's number of tickets and, hence, her winning probability. Each token the dictator allocates to the recipient is converted into ϕ lottery tickets ($1 \leq \phi \leq \frac{100-p}{20}$). The parameter ϕ, whose value is also common knowledge, captures how *effective* a token allocated to the recipient is in raising the winning probability.

We can express the lottery faced by the recipient as a probability distribution over final earnings. Given x, the probability distribution is $(P(x) : 20000, 1 - P(x) : 0)$, where $P(x) := \frac{p+\phi\, x}{100}$. Note that the probability distribution over final earnings is the same regardless of the recipient's endowment.

2.2 The dictator's preferences for giving

Next, we introduce the model of other-regarding preferences we use to analyze the dictator game with risky outcomes. The dictator does not know the recipient's attitude toward risk. Hence, the dictator forms a guess about the recipient's risk preferences in order to evaluate the recipient's lottery. Numerous studies that investigate people's predictions of others' preferences have found that predictors—including financial professionals—commonly assume (often to an unwarranted degree) that others' preferences are similar to theirs; even when relevant information about the judged subject is readily available, predictors tend to strongly rely on their personal preferences (see, e.g., Roth and Voskort [2014] and references therein). This pattern has been established with regard to risk preferences in particular (Faro and Rottenstreich 2006; Hadar and Fischer 2008; Chakravarty et al. 2011; Roth and Voskort 2014). Drawing on these studies, we assume the dictator projects her own risk preferences onto the recipient in such a way that her prediction is strongly correlated with her own risk preferences. For ease of exposition, and without loss of generality, we consider the case in which the dictator assumes that the recipient's risk attitudes perfectly coincide with her own.

We assume that the recipient's utility of the lottery is the sum of two components: "consumption" utility and "gain-loss" utility. Because the lottery features small-scale risk, we assume consumption utility to be linear in outcomes and equal to the lottery outcome (Rabin 2000; Rabin and Thaler 2001; Kőszegi and Rabin 2007). Gain-loss utility is derived from comparing each potential outcome to a reference point. An outcome that is larger than the referent feels like a gain whereas an outcome that is smaller than the referent feels like a loss. The gain-loss utility is defined by the function $\mu(z - r)$, where z COP is a possible lottery outcome (i.e., $z \in \{0, 20000\}$) and r COP is a reference outcome. Following Section IV of Kőszegi and Rabin (2006), we adopt a piecewise-linear gain-loss utility function: $\mu(z-r) = \eta \cdot (z-r)$ for $z - r \geq 0$ and $\mu(z-r) = \eta \cdot \lambda \cdot (z-r)$ for $z - r < 0$, with $\eta \geq 0$ and $\lambda > 1$; η denotes the strength of gain-loss utility (relative to consumption utility) and λ denotes the degree of loss aversion.

The reference point for the lottery outcome, r, might be stochastic (Sugden 2003; Kőszegi and Rabin 2007; Schmidt, Starmer, and Sugden 2008). Let r be drawn from some probability distribution R^{rec}, which, for simplicity, we assume to be discrete; $q(r)$ is the probability of r. Following Kőszegi and Rabin (2006, 2007), the dictator's guess about the recipient's ex-ante utility of the lottery is

$$\begin{aligned} U^{rec}(x|R^{rec}) = {} & 20000 \; \pi\left(P(x)\right) \\ & + \pi\left(P(x)\right) \cdot \left[\sum_r \mu(20000 - r) \; \pi(q(r))\right] \\ & + \left[1 - \pi\left(P(x)\right)\right] \cdot \left[\sum_r \mu(0 - r) \; \pi(q(r))\right], \end{aligned} \tag{1}$$

where $\pi(.)$ is some strictly increasing probability weighting function that satisfies $\pi(0) = 0$ and $\pi(1) = 1$. The first term is the expected consumption utility of the lottery. The remaining terms represent the expected gain-loss utility. The second term is the gain-loss utility when the outcome of the lottery is 20,000 COP, multiplied by the (weighted) probability of occurrence ($\pi\left(P(x)\right)$). Note the gain-loss utility of 20,000 COP is the (weighted) average of how this outcome feels relative to each possible realization of the reference point R^{rec}. Following the same logic, the third term is the gain-loss utility when the lottery outcome is 0 COP, also multiplied by the (weighted) probability of occurrence ($1 - \pi\left(P(x)\right)$).

We consider a broad set of candidates for the reference point R^{rec}:

(i) the recipient's experimental endowment, R^{rec}_{end};

(ii) the gamble $(\hat{P} : 20000, 1 - \hat{P} : 0)$, for some fixed $\hat{P} \in [0,1]$; we denote this reference point by $R^{rec}_{\hat{P}}$;

(iii) the gamble $(P(\hat{x}) : 20000, 1 - P(\hat{x}) : 0)$, for some fixed $\hat{x} \in [0, 20]$; we denote this reference point by $R^{rec}_{\hat{x}}$.

Suppose the reference point for the recipient's payoff is R^{rec}_{end}. When the recipient is endowed with 20,000 COP, an outcome of 20,000 COP feels neutral, while an outcome of 0

COP feels like a loss. Thus, we obtain from (1) that the recipient's expected utility is

$$U^{rec}(x|R^{rec}_{end}=20000)=[20000\ \pi\left(P(x)\right)]+[\pi\left(P(x)\right)\cdot\mu(0)+(1-\pi\left(P(x)\right))\cdot\mu(-20000)]\,.$$

When, instead, the recipient is endowed with 0 COP, an outcome of 20,000 COP feels like a gain, whereas an outcome of 0 COP feels neutral. Thus, the lottery does not feature any potential loss to the recipient. In this case, the recipient's expected utility is

$$U^{rec}(x|R^{rec}_{end}=0)=[20000\ \pi\left(P(x)\right)]+[\pi\left(P(x)\right)\cdot\mu(20000)+(1-\pi\left(P(x)\right))\cdot\mu(0)]\,.$$

In sum, when the reference point is R^{rec}_{end}, the recipient's expected utility is

$$U^{rec}(x|R^{rec}_{end})=\begin{cases}20000\ \ (\pi\left(P(x)\right)-(1-\pi\left(P(x)\right))\ \ \eta\ \lambda) & \text{if } R^{rec}_{end}=20000\\ 20000\ \pi\left(P(x)\right)\ \ (1+\eta) & \text{if } R^{rec}_{end}=0.\end{cases}\tag{2}$$

If the reference point is $R^{rec}_{\hat{P}}$, we obtain from (1) that the recipient's expected utility is

$$\begin{aligned}U^{rec}(x|R^{rec}_{\hat{P}})=&\ [20000\ \pi\left(P(x)\right)]\\&+\pi\left(P(x)\right)\ \ [\mu(0)\ \pi(\hat{P})+\mu(20000)\ (1-\pi(\hat{P}))]\\&+(1-\pi\left(P(x)\right))\ \ [\mu(-20000)\ \pi(\hat{P})+\mu(0)\ (1-\pi(\hat{P}))].\end{aligned}$$

The reference point $R^{rec}_{\hat{P}}$ nests two deterministic referents. When $\hat{P}=0$, the dictator evaluates the recipient's final payoff relative to the recipient's initial wealth (i.e., her wealth before participating in the experiment), as in Prospect Theory (Kahneman and Tversky 1979; Tversky and Kahneman 1992). This implies that a payoff of 20,000 COP feels like a gain, while a payoff of 0 COP feels neutral; note $U^{rec}(x|R^{rec}_{\hat{P}};\hat{P}=0)=U^{rec}(x|R^{rec}_{end}=0)$. When, instead, $\hat{P}=1$, the dictator evaluates the recipient's final payoff relative to the lottery prize. This implies that an outcome of 20,000 COP feels neutral, whereas an outcome of 0 COP feels like a loss; note $U^{rec}(x|R^{rec}_{\hat{P}};\hat{P}=1)=U^{rec}(x|R^{rec}_{end}=20000)$.

If $\hat{P}\in(0,1)$, each possible lottery outcome induces mixed feelings. The second term in the above expression for $U^{rec}(x|R^{rec}_{\hat{P}})$ is the expected gain-loss utility of 20,000 COP, which is given by the (weighted) average of how this outcome feels relative to 20,000 COP (neutral) and 0 COP (gain). In this weighted average, the comparison with 20,000 COP receives weight $\pi(\hat{P})$ while the comparison with 0 COP receives weight $1-\pi(\hat{P})$. Similarly, the third term is the gain-loss utility of 0 COP, which is given by the (weighted) average of how this outcome feels relative to 20,000 COP (loss) and 0 COP (neutral).[7] The above expression for

[7]If the reference point were the consumption-based certainty equivalent of the gamble $(\hat{P}:20000, 1-\hat{P}:0)$

$U^{rec}(x|R^{rec}_{\hat{P}})$ reduces to

$$U^{rec}(x|R^{rec}_{\hat{P}}) = 20000\ \pi\left(P(x)\right)\ \left[1+\eta\ \left(1-\pi(\hat{P})\right)\right] \tag{3}$$
$$-\ 20000\ \left(1-\pi\left(P(x)\right)\right)\ \pi(\hat{P})\ \eta\ \lambda.$$

Finally, if the reference point is $R^{rec}_{\hat{x}}$, we obtain from (1) that the recipient's expected utility is

$$U^{rec}(x|R^{rec}_{\hat{x}}) = 20000\ \pi\left(P(x)\right)\ \ [1+\eta\ \ (1-\pi(P(\hat{x})))] \tag{4}$$
$$-\ 20000\ \left(1-\pi\left(P(x)\right)\right)\ \pi\left(P(\hat{x})\right)\ \eta\ \lambda.$$

We make the assumption that the value of $\hat{x}$ does not depend on ϕ or p and is therefore fixed across tasks for any given individual. Even so, note that the referent gamble induced by $R^{rec}_{\hat{x}}$ still varies with the values of ϕ and p through their effect on $P(\hat{x}) = \frac{p+\phi\hat{x}}{100}$. This variation across tasks is in contrast to R^{rec}_{end} and $R^{rec}_{\hat{P}}$, both of which induce referent gambles that do not vary with ϕ and p.

One possible interpretation of $R^{rec}_{\hat{x}}$ is that it reflects the dictator's recent expectation to allocate $\hat{x}$ tokens to the recipient. The dictator then takes the resulting probability distribution over outcomes as a benchmark to evaluate each possible allocation.[8]

In our model of other-regarding preferences, the dictator might evaluate her *own* payoff relative to a reference point, R^{dic}. We consider two candidates for such reference point:

(i) the dictator's initial wealth (i.e., her wealth before participating in the experiment), R^{dic}_{wealth};

(ii) the dictator's experimental endowment, R^{dic}_{end}.

If the dictator perceives R^{dic}_{wealth} as the reference point for her own payoff, her final payoff

(i.e., 20000 $\pi(\hat{P})$), rather than the gamble itself, the recipient's utility would be the same. This follows from the linearity of consumption and gain-loss utilities.

[8] This interpretation allows for two types of expectations. On the one hand, a dictator might form rational expectations, which are consistent with her optimal behavior ex-post. Thus, $R^{rec}_{\hat{x}}$ is a rational-expectation-based reference point if allocating $\hat{x}$ tokens to the recipient is optimal given the expectation to allocate $\hat{x}$ tokens. In this case, the dictator's optimal choice and her expectation form a personal equilibrium (Kőszegi and Rabin 2006, 2007). On the other hand, the dictator might have naïve expectations, in the sense that she might end up giving an amount other than $\hat{x}$ tokens, contrary to her expectation. The predictions of the model on which we focus do not depend on whether the dictator's expectations are rational or naïve.

feels like a gain. Her utility is

$$\begin{aligned} U^{dic}(x|R^{dic}_{wealth}) &= 30000 - 500\ x + \mu(30000 - 500\ x) \\ &= (1+\eta)\ \ (30000 - 500\ x)\,. \end{aligned} \tag{5}$$

Suppose, instead, that the dictator perceives R^{dic}_{end} as the reference point for her own payoff. Because she is aware that she can take the whole pool of tokens for herself, we assume that she regards the pool of tokens (worth 10,000 COP to her) as part of her endowment. Then, if the dictator has reference-dependent preferences, she regards the monetary value of the tokens allocated to the recipient as a loss for herself. In this case, the dictator's giving behavior might be affected by an endowment effect (Thaler 1980). The dictator's individual utility from her own payoff is

$$\begin{aligned} U^{dic}(x|R^{dic}_{end}) &= 30000 - 500\ x + \mu(-500\ x) \\ &= 30000 - 500\ x\ (1 + \eta\ \lambda). \end{aligned} \tag{6}$$

Given a token allocation, the dictator's *overall* utility depends on individual utilities, $U^{dic}(x|R^{dic})$ and $U^{rec}(x|R^{rec})$. We assume the dictator is self-interested but is also concerned about the recipient's well-being. To capture the dictator's preferences over token allocations, we employ an augmented version of Fehr and Schmidt's (1999) utility function. In particular, we allow the overall utility function to be concave in the level of favorable inequality between the dictator and the recipient, which is given by $I(x|R^{dic}, R^{rec}) := U^{dic}(x|R^{dic}) - U^{rec}(x|R^{rec})$. Thus, the dictator's overall utility is

$$W(x|R^{dic}, R^{rec}) = U^{dic}(x|R^{dic}) - \beta\ I(x|R^{dic}, R^{rec})^{\gamma}, \tag{7}$$

where $\beta \in [0, 1]$ and $\gamma \geq 1$. The parameter β captures the extent to which the dictator dislikes favorable inequality; hence, following Blanco, Engelmann, and Normann (2011), we interpret β as the dictator's degree of guilt aversion.[9] For any $(R^{dic}, R^{rec}) \in \{R^{dic}_{wealth}, R^{dic}_{end}\} \times \{R^{rec}_{end}, R^{rec}_{\hat{P}}, R^{rec}_{\hat{x}}\}$, inequality decreases with the number of tokens allocated to the recipient.[10]

[9]Because the dictator's final payoff is at least 20,000 COP while the recipient's final payoff is at most 20,000 COP, the dictator will enjoy a larger consumption utility than the recipient. If we also consider gain-loss utility, however, there exist token allocations that result in unfavorable inequality for some combination of risk parameters and reference points. One example is $x = 20$ when $p = 40$, $\phi = 3$, $\eta > 0$, $R^{dic} = R^{dic}_{endow}$, $R^{rec} = R^{rec}_{\hat{P}}$, and $\hat{P} = 0$. In Fehr and Schmidt's model, individuals dislike unfavorable inequality more than they dislike favorable inequality. This implies that a dictator would never choose a token allocation that results in unfavorable inequality in our setting. Therefore, to simplify notation, we decided to suppress the additional term that captures unfavorable inequality from (7).

[10]An alternative model of inequality aversion is the one proposed by Bolton and Ockenfels (2000). Extrapo-

The dictator chooses x to maximize (7). The marginal utility of a token allocated to the recipient is

$$\frac{\partial W(x|R^{dic}, R^{rec})}{\partial x} = \frac{\partial U^{dic}(x|R^{dic})}{\partial x} - \beta\ \gamma\ I(x|R^{dic}, R^{rec})^{\gamma-1}\ \frac{\partial I(x|R^{dic}, R^{rec})}{\partial x}. \tag{8}$$

The first term on the right-hand side of (8) represents the marginal disutility experienced by the dictator. The second term captures the value attached by the dictator to the marginal reduction of inequality. Such value increases with the degree of guilt aversion, β. If $\gamma > 1$, the marginal reduction of inequality is more valued by the dictator the larger current inequality is. Note that if $\beta = 0$, the optimal allocation is $x^* = 0$. Hereafter, we explore the dictator's giving behavior when $\beta > 0$.

For ease of exposition, we have made two simplifying assumptions in our model of other-regarding preferences. First, the dictator's motive for giving is her concern for inequality. Second, to evaluate the extent of inequality associated with any token allocation, the dictator compares her own (sure) utility to the recipient's *ex-ante* utility—which is given by the expected utility of the lottery. Importantly, these assumptions are without loss of generality. First, as we show in Appendix A.3, all the comparative statics for giving behavior that we discuss in the next section would also obtain if the dictator had other well-known motives for giving. In particular, all the results hold if the dictator cares about total surplus (i.e., efficiency), cares particularly about the least well-off—as captured by Charness and Rabin's (2002) model of social-welfare or quasi-maximin preferences, or is motivated by egocentric altruism (Cox, Friedman, and Gjerstad 2007). Second, the qualitative implications of our model based on ex-ante comparisons of utilities remain true if the dictator cares, partially or exclusively, about ex-post inequality. In the proofs of the propositions that follow, we allow for both ex-ante and ex-post comparisons of utilities, as in Fudenberg and Levine (2012) and Brock, Lange, and Ozbay (2013).

2.3 The dictator's giving behavior

In this sub-section, we investigate how the dictator's choice of allocation is affected by: the effectiveness of giving (ϕ), the baseline winning probability ($\frac{p}{100}$), the recipient's experimental

lating their model to the current setting, the dictator's overall utility function would be $W_{BO}(x|R^{dic}, R^{rec}) = v(U^{dic}(x|R^{dic}), \sigma)$, where σ denotes the dictator's share of the total utility; for a given $U^{dic}(x|R^{dic})$, $v(.)$ is maximal if $\sigma = \frac{1}{2}$. Because the dictator is never worse off than the recipient, Bolton and Ockenfels' model turns out to be indistinguishable from Fehr and Schmidt's model in our setting; hence, the choice of model is irrelevant for the analysis of behavior. We chose Fehr and Schmidt's model for expositional convenience. For an experiment that exploits three-person distribution games to compare the performance of the two models, see Engelmann and Strobel (2004).

endowment, and the dictator's degree of loss aversion (λ). In Propositions 1-3, we present the results regarding ϕ and p. These results hold regardless of reference point and even regardless of whether preferences are reference-dependent. We then discuss the effect of the recipient's experimental endowment on giving in Proposition 4. This effect depends on the dictator's reference point for the recipient's payoff and also on whether the dictator is loss averse. Finally, Proposition 5 establishes how the extensive margin of giving varies with λ and how that effect is mediated by β. All proofs are in Appendix A.

Our first result describes how the dictator's willingness to participate in giving (i.e., allocate at least one token to the recipient) depends on the value of ϕ.

PROPOSITION 1 (effect of ϕ on participation). As each token allocated to the recipient becomes more effective in raising the winning probability, the dictator's likelihood of participation weakly increases.

If the dictator was already giving a positive amount of tokens, then she will continue to participate after an increase in ϕ. On the other hand, if her optimal choice before the increase in ϕ was not to participate, she might decide to participate following the increase in ϕ.

The positive association between ϕ and dictator participation is the most robust implication of our model of other-regarding preferences—it holds for any value of γ, any shape of the probability weighting function, any combination of reference points (R^{dic}, R^{rec}), and even regardless of whether preferences are reference-dependent. Our model does not yield such a general result for the association between ϕ and the *amount* of tokens given. For instance, if the dictator distorts probabilities (i.e., $\pi(z) \neq z$ for some $z \in (0, 1)$) or her overall utility is strictly concave in the level of inequality (i.e., $\gamma > 1$), the effect of ϕ on the intensive margin of giving is ambiguous.

To see why, consider a dictator who is already giving a non-zero amount of tokens. First, assume the dictator does not distort probabilities but $\gamma > 1$. An increase in ϕ has two opposite effects on the incentive to give. On the one hand, the *marginal* token becomes more effective in (further) raising the winning probability and, hence, achieves a larger reduction in inequality; this encourages the dictator to give *more* tokens. On the other hand, because all *inframarginal* tokens become more effective too, the winning probability is already larger after an increase in ϕ. This, in turn, reduces inequality. Because inequality is now smaller, the reduction of inequality achieved by the marginal token is less valued by the dictator. This induces the dictator to contribute *fewer* tokens to the recipient. For values of γ sufficiently close to one, the first one of the two opposite forces always dominates; hence, we expect the number of tokens given to rise as ϕ increases. By contrast, if γ is large, the second force might dominate, and hence the dictator's contribution might decrease. (We illustrate how γ

affects the relationship between ϕ and giving behavior with a simple simulation exercise in Panel A of Appendix Figure A1.)

Now, consider the additional influence of subjective probability weighting on giving. After an increase in ϕ, the winning probability rises. Due to subjective weighting, such an increase in the winning probability will affect the weight the dictator attaches to the *marginal* increase in the winning probability (produced by the marginal token). Therefore, depending on the specific shape of the probability weighting function, the number of tokens given could either increase or decrease as ϕ increases. (See Panel B of Appendix Figure A1 for an illustration of how $\pi(.)$ influences the effect of ϕ on giving.)

If we restrict our model of other-regarding preferences to the special case in which $\pi(z) = z$ for all $z \in [0, 1]$ and $\gamma = 1$, we are able obtain a clear comparative static for the optimal allocation as a function of ϕ. In this case in which overall utility is *linear* in x, an increase in ϕ makes the dictator willing to allocate more tokens to the recipient, regardless of the amount of tokens she is already giving.

PROPOSITION 2 (effect of ϕ on amount of tokens allocated to recipient). If $\pi(z) = z$ for all $z \in [0, 1]$ and $\gamma = 1$, the amount of tokens allocated to the recipient is weakly increasing in ϕ.

To see the intuition behind Proposition 2, first note the dictator will choose to give a number of tokens such that her individual utility is (weakly) larger than the recipient's utility. Let $\tilde{x}$ denote the greatest number of tokens for which $U^{dic} \geq U^{rec}$. Because overall utility is linear in x, the optimal allocation x^* will be either 0, $\min\{\tilde{x}, 20\}$, or any allocation between 0 (inclusive) and $\min\{\tilde{x}, 20\}$ (inclusive). Using expressions (2)-(4), it is straightforward to see that an increase in ϕ raises the recipient's marginal utility of a token, which strengthens the dictator's incentive to give. If $x^* = 0$ for a given value of ϕ, an increase in ϕ *might* push the dictator to give something rather than nothing. If, instead, $x^* \in [0, \min\{\tilde{x}, 20\}]$ and the dictator is giving an interior amount, an increase in ϕ *will* induce the dictator to choose $x^* = \min\{\tilde{x}, 20\}$. Finally, if $x^* = \min\{\tilde{x}, 20\}$, the dictator will continue to choose this allocation if ϕ increases.

We now turn to the relationship between the baseline probability of success ($\frac{p}{100}$) and giving. If the dictator distorts probabilities or her overall utility is strictly concave in the level of inequality, the effect of p is ambiguous both on the extensive and intensive margins of giving. If, on the contrary, overall utility is linear in x, there is a clear comparative static for the optimal allocation as a function of p.

PROPOSITION 3 (effect of p on amount of tokens allocated to recipient). If $\pi(z) = z$ for all $z \in [0, 1]$ and $\gamma = 1$, the amount of tokens allocated to the recipient is weakly increasing *in p.*

Like in Proposition 2, the linearity of overall utility in x implies that the optimal allocation x^* will be either 0, $\min\{\tilde{x}, 20\}$, or any allocation between 0 (inclusive) and $\min\{\tilde{x}, 20\}$ (inclusive). Using expressions (2)-(4), it is straightforward to see that the recipient's marginal utility of a token does not depend on p if $R^{rec} \in \{R^{rec}_{end}, R^{rec}_{\hat{P}}\}$, but increases with p if $R^{rec} = R^{rec}_{\hat{x}}$ and the dictator is loss averse. This implies that x^* does not vary with p if $R^{rec} \in \{R^{rec}_{end}, R^{rec}_{\hat{P}}\}$, but might increase with p if $R^{rec} = R^{rec}_{\hat{x}}$ and the dictator is loss averse. Specifically, if $R^{rec} = R^{rec}_{\hat{x}}$ and $x^* = 0$ for a given value of p, an increase in p *might* push a loss-averse dictator to give something rather than nothing. If, instead, $x^* \in [0, \min\{\tilde{x}, 20\}]$ and the dictator is giving an interior amount, an increase in p *will* lead a loss-averse dictator to choose $x^* = \min\{\tilde{x}, 20\}$.

Next, in Proposition 4, we present one implication of loss aversion within our model of other-regarding preferences. We compare the allocation chosen by a loss-averse dictator when the recipient is endowed with 20,000 COP to the one chosen when the recipient is endowed with 0 COP.

PROPOSITION 4 (effect of recipient's experimental endowment on giving). Suppose the dictator has reference-dependent preferences and is loss averse.

(a) If the reference point for the recipient's payoff is $R^{rec}_{\hat{P}}$ or $R^{rec}_{\hat{x}}$, *the dictator chooses the same allocation regardless of the recipient's endowment.*

(b) If the reference point for the recipient's payoff is R^{rec}_{end}, *the dictator allocates more tokens to the recipient when the recipient's endowment is 20,000 COP.*

Part (a) is the result of the recipient's utility (and hence overall utility) being the same regardless of the recipient's experimental endowment. To see the intuition for part (b), consider a loss-averse dictator whose reference point is the recipient's endowment, R^{rec}_{end}. If the recipient is endowed with 0 COP, an outcome of 0 COP feels neutral, while an outcome of 20,000 COP feels like a gain. By contrast, if the recipient is endowed with 20,000 COP, an outcome of 0 COP feels like a loss, whereas an outcome of 20,000 COP feels neutral. In sum, the lottery features a potential loss of 20,000 COP if the recipient is endowed with 20,000 COP, and it features an equal-sized potential gain if the recipient is endowed with 0 COP. Hence, each token allocated to the recipient increases the chance of (i) avoiding a 20,000 COP loss if the endowment is 20,000 COP, or (ii) achieving an equal-sized gain if the endowment is 0 COP. A loss-averse dictator will be more willing to help the recipient avoid a 20,000 COP loss than to help the recipient achieve an equal-sized gain; hence, the dictator will transfer more tokens when the recipient is endowed with 20,000 COP.

Finally, in Proposition 5, we characterize the relationship between the dictator's degree of loss aversion and her likelihood of participation. Such relationship depends on whether the dictator's reference point for her own payoff is her initial wealth (R^{dic}_{wealth}) or her endowment (R^{dic}_{end}).

PROPOSITION 5 (relationship between λ and dictator participation). Suppose the dictator has reference-dependent preferences and is loss averse.

1) Consider the case in which $R^{dic} = R^{dic}_{wealth}$.

(a) If $R^{rec} = R^{rec}_{\hat{P}}$ with $\hat{P} = 0$, $R^{rec} = R^{rec}_{\hat{x}}$ with $P(\hat{x}) = 0$, or $R^{rec} = R^{rec}_{end}$ and the recipient is endowed with 0 COP, the probability that the dictator will participate is unaffected by her degree of loss aversion.

(b) If $R^{rec} = R^{rec}_{\hat{P}}$ with $\hat{P} \in (0, 1]$, $R^{rec} = R^{rec}_{\hat{x}}$ with $P(\hat{x}) \in (0, 1]$, or $R^{rec} = R^{rec}_{end}$ and the recipient is endowed with 20,000 COP, the probability that the dictator will participate is weakly increasing in her degree of loss aversion.

2) Now, consider the case in which $R^{dic} = R^{dic}_{end}$. For each $R^{rec} \in \{R^{rec}_{end}, R^{rec}_{\hat{P}}, R^{rec}_{\hat{x}}\}$, there exists a cut-off $\tilde{\beta}_{R^{rec}} \in (0, 1]$ such that:

(a) if $\beta > \tilde{\beta}_{R^{rec}}$, the probability that the dictator will participate is weakly increasing in her degree of loss aversion.

(b) if $\beta \leq \tilde{\beta}_{R^{rec}}$, the probability that the dictator will participate is weakly decreasing in her degree of loss aversion.

3) For both $R^{dic} = R^{dic}_{wealth}$ and $R^{dic} = R^{dic}_{end}$, the change in the probability of participation following a given increase in λ is weakly increasing in β.

To see the intuition behind Proposition 5, first consider part (1), in which the dictator's reference point for her own payoff is her initial wealth. In this case, the dictator does not experience losses by transferring tokens to the recipient. (Giving only reduces individual gains relative to initial wealth.) As a result, the dictator's degree of loss aversion can affect overall utility only through the recipient's individual utility.

In part (1)(a), the recipient does not face any potential loss either. Because neither the dictator nor the recipient face potential losses, overall utility, and hence the dictator's participation, is unaffected by λ. In part (1)(b), the recipient does face potential losses. The more loss averse the dictator is, the more severe she thinks the recipient's potential losses are. Because the recipient is the *only* one facing losses, each token given reduces the chance that she will experience a loss without yielding any loss to the dictator. Therefore, for any degree of guilt aversion (provided $\beta > 0$), the marginal utility of the first token allocated to the recipient increases with λ; as a result, the probability that the dictator will participate weakly increases with λ. Part (3) implies that the magnitude of the positive effect of loss aversion on participation weakly increases with β.

Next, consider part (2), in which the dictator's reference point for her own payoff is her endowment. In this case, the dictator experiences losses by transferring tokens to the recipient, because she regards the pool of tokens as part of her own endowment. On the other hand, each token given helps to increase the probability that the recipient will experience a gain, reduce the probability that the recipient will experience a loss, or both. Giving, therefore, entails a trade-off between the dictator's losses and the recipient's potential gains/losses. If the dictator has *low* guilt aversion (i.e., $\beta \leq \tilde{\beta}_{R^{rec}}$), she will weigh her own losses more heavily than the recipient's potential gains/losses; hence, the dictator will be *less* willing to participate the more loss averse she is. Part (3) implies that this reduction in participation that results from a given increase in λ weakly decreases with β in the range $\beta \leq \tilde{\beta}_{R^{rec}}$. By contrast, if the dictator has *high* guilt aversion (i.e., $\beta > \tilde{\beta}_{R^{rec}}$), the recipient's losses are more meaningful to the dictator; as a result, the dictator will be *more* willing to participate the more loss averse she is. Part (3) implies that this increase in participation that follows a given increase in λ will be larger among dictators with larger values of β.

3 Experimental design

3.1 General aspects

In order to test our augmented model of other-regarding preferences, we conducted an experiment at the laboratory of the Department of Economics at Universidad del Rosario, in the city of Bogotá. We ran the experiment between September 12 and September 15 of 2016, with students drawn from the laboratory's subject pool. We recruited a total of two hundred and twenty undergraduate and graduate students representing a variety of majors to participate in one of eight study sessions. Each study session corresponded to one of two conditions—labeled POSITIVE ENDOWMENT and ZERO ENDOWMENT. All payments (including a 10,000 COP attendance fee) were made in cash and in private at the end of each session. Each study session lasted approximately 90 minutes, and its design had the following basic features.

Participants first gathered in the laboratory. They received a copy of the general instructions, which were also read aloud by an experimenter. Half of the participants were randomly assigned to be Person 1, and the other half were assigned to be Person 2. Next, they received an envelope, which they would keep until the end of the session. The envelopes of those who were assigned to be Person 1 contained 20,000 COP. On the other hand, the contents of the envelopes of those who were assigned to be Person 2 varied between the two conditions. In the POSITIVE ENDOWMENT condition, Person 2's envelope contained 20,000 COP; by contrast, in the ZERO ENDOWMENT condition, Person 2's envelope was empty. In each condition, the amount of money contained in the envelope of a Person 1 subject or a Person 2 subject was common knowledge.

Participants who had been assigned to be Person 2 were then led into a separate room. Person 1 subjects remained in the first room. Each Person 1 subject was randomly matched to one Person 2 subject without revealing either of their identities to the other. Participants were not permitted to communicate before or during the session. Two experimenters were present in each of the two rooms until the end of the session. Once all participants completed all the tasks, they answered a few demographic questions. Finally, one task was randomly selected to be played out to determine payments. Participants learned which task had been randomly selected for payment.

In each session, Person 1 subjects completed nineteen tasks while Person 2 subjects completed fourteen tasks. In the general instructions we provided at the beginning of the session, we did not tell participants how many tasks they would complete or explain the overall structure of the tasks. (We just mentioned that Person 1 subjects would allocate resources between themselves and their Person 2 partners.) Thus, when participants completed a subset of tasks, they were unaware of what was coming next. Our main analysis relies on Tasks 1-10 and Tasks 18-19 completed by Person 1 subjects; we use the remaining tasks to conduct additional analyses and robustness checks of our main results. Next, we focus on the description of the main tasks and briefly mention the additional tasks. In Online Appendices B and C, we describe and analyze the additional tasks in detail. Online Appendix E contains experimental instructions (translated into English).

3.2 Description of tasks and identification strategy

3.2.1 Dictator games with risky outcomes

In Tasks 1-9, we implemented a series of dictator games with risky outcomes that tightly matched the game described in Section 2.1. In these games, the dictator—Person 1—had to allocate twenty tokens between herself and a recipient—her unknown Person 2 partner. The dictator always kept her original 20,000 COP and could earn additional sure money, while the recipient faced risk. Specifically, the dictator decided how many tokens to give to the recipient and took the remaining tokens for herself. She could allocate anything between zero tokens (inclusive) and twenty tokens (inclusive) to the recipient. Every token that the dictator took for herself was worth 500 COP. By contrast, the recipient faced a lottery, and each token allocated to the recipient was converted into lottery tickets at a known rate. By allocating tokens to the recipient, the dictator could increase the odds that the recipient won the lottery. In the POSITIVE ENDOWMENT condition, the recipient would *keep* her 20,000 COP endowment if she won the lottery and would *lose* her endowment if she failed to win. In the ZERO ENDOWMENT condition, the recipient would *receive* 20,000 COP if she won the lottery and would *not receive* anything if she failed to win.

We varied the recipient's lottery across tasks by manipulating (i) the initial number of lottery tickets had by the recipient (denoted by p) and (ii) the rate at which each token allocated to the recipient was converted into additional lottery tickets (denoted by ϕ). The recipient could start out with either zero, twenty, or forty lottery tickets. Given an initial number of tickets, each token transferred to the recipient was worth either one, two, or three additional lottery tickets. Table 1 summarizes these features of the nine dictator game tasks.

[Table 1 about here]

After listening to the instructions and correctly answering some comprehension questions, participants received a block of nine decision forms, each of which corresponded to one of the nine tasks. In each decision form, dictators had to circle the number of tokens they wanted to allocate to the recipient. If any of Tasks 1-9 was selected for payment, the corresponding decision forms that dictators had filled out would be taken to the recipients' room; each recipient would then be randomly assigned a form and would play the resulting lottery from that form.[11] We did not reveal the identity of either of the subjects within a pair. Dictators' choices, therefore, could not be affected by a concern for making a good impression on the recipient or inducing reciprocal actions outside the experiment (Andreoni and Bernheim 2009). Each recipient could see (before the lottery was resolved) the allocation chosen by their partner in the lottery that had been selected for payment. This feature made the resolution of uncertainty completely transparent to recipients. On the other hand, dictators did not learn the outcome of the lottery.[12]

[11]We faced dictators with the nine games together, rather than one game at a time, to reduce decision-making error. A potential drawback of letting dictators' know all the games in advance is that it could have affected the reference point for the recipient's payoff in a way that is not captured by our model. In particular, the dictator's reference point could be a meta-lottery, constructed as the dictator's rationally expected distribution of outcomes resulting from all of the (anticipated) giving decisions in the nine dictator games (Sprenger 2015). This, however, is very unlikely, because constructing such a "grand" reference point poses extreme cognitive demands on subjects. Indeed, to the best of our knowledge, there is no empirical evidence supporting this hypothesis.

[12]Disclosure of dictators' choices served two purposes. First, recipients could be sure that final payments had not been rigged by the experimenters. Second, the commonly known one-to-one mapping from dictator choices to recipient lotteries eliminated the moral "wiggle room" for dictators to behave more selfishly (Dana, Weber, and Kuang 2007). Unlike us, Brock, Lange, and Ozbay (2013) did not reveal which task had been randomly selected for payment or what the dictator's choice had been in that task. Thus, recipients learned only the outcome of the selected task. For a discussion about the potential effects of moral "wiggle room" in Brock, Lange, and Ozbay's (2013) experiment, see the back-and-forth between Krawczyk and Le Lec (2016) and Brock, Lange, and Ozbay (2016).

In Section 4, we use the data on dictators' choices in Tasks 1-9 to test Propositions 1-4 from the theoretical framework. To test Proposition 5, we also need dictator-specific measures of the degree of guilt aversion, β, and the degree of loss aversion, λ. In the following two sub-sections, we explain how we obtained such measures.

3.2.2 A proxy for β

In Task 10, we used a price list to obtain a dictator-specific proxy for the degree of guilt aversion, β. The list, which we adapted from Exley (2016), had twenty-one decision rows. In each decision row, dictators had to choose between two Options (A and B). Option A, which was fixed across all rows, offered a sure final payment of 20,000 COP to the recipient and no additional payment to the dictator (relative to her original 20,000 COP).[13] Option B offered a final payment of 0 COP to the recipient and a sure payment to the dictator that would be added to her original 20,000 COP; this additional payment increased from 0 COP (first row) to 20,000 COP (last row), in steps of 1,000 COP.

From dictators' decisions in Task 10, we estimate dictator-specific valuations of a sure payment of 20,000 COP to the recipient as follows. Suppose a dictator first switches from choosing Option A to Option B in the i^{th} row and that this corresponds to the dictator receiving an additional B_i COP. Since the amount in Option B increases as participants proceed down the rows, a dictator's valuation falls between B_{i-1} and B_i. We then follow previous literature by estimating a dictator's valuation as the midpoint, i.e., $\frac{B_{i-1}+B_i}{2}$.[14]

According to the inequality aversion model from Section 2, a dictator's valuation reflects her concern for equality in the dictator games with risky outcomes.[15] The valuation represents the amount of additional money the dictator is willing to sacrifice so that the recipient gets 20,000 COP *for sure*. Task 10, therefore, eliminates recipient risk while featuring the same monetary stakes for the recipient as those from the dictator games with risky outcomes. Hence, a dictator's valuation separately identifies her degree of guilt aversion, β, avoiding the confound of risk attitudes. Under the assumption that γ is the same for all dictators and is

[13] Consistent with our manipulation of the recipient's endowment, the wording used to describe Option A was slightly different between the two conditions. Option A was presented as "Person 2 keeps her 20,000 COP for sure" in the POSITIVE ENDOWMENT condition while it was presented as "Person 2 receives 20,000 COP for sure" in the ZERO ENDOWMENT condition.

[14] Two participants never chose Option B—i.e., they always chose 20,000 COP for the recipient over themselves receiving any amount up to 20,000 COP. To distinguish these two participants from those who first switched to Option B in the last row, we assumed their switch point was 21,000 COP.

[15] According to a broader interpretation, the valuation reflects the dictator's concern for the recipient's well-being. Departures from self-interest in Task 10 might be affected by a motivation to reduce advantageous inequality, increase aggregate surplus, or both. As noted by Charness and Rabin (2002), we cannot distinguish between these motives because Task 10 only allows efficient helpful sacrifice that decreases inequality. As we mentioned at the end of Section 2, however, our analysis of giving behavior is independent of whether giving is driven by equity or social-welfare considerations.

not too large, our model of other-regarding preferences implies that the dictator's valuation is increasing in β. Because the essence of our analysis relies on the ranking of individual β's (rather than their value), we take a dictator's valuation, divided by 20,000, as a proxy for β.[16]

We also check how our proxy for β relates to an alternative measure of guilt aversion introduced by Blanco, Engelmann, and Normann (2011). In Task 17, we adapted their modified dictator game to elicit such a measure. In Appendix B.3, we discuss the relationship between Blanco, Engelmann, and Normann's measure and our proxy for β.

3.2.3 An estimate of λ

After all dictators completed Tasks 1-17, we randomly selected one task and determined payments. Recipients were paid in private and left the session. Before paying dictators, we asked them to complete two more tasks in which they had the opportunity to earn additional money. We told them that, after they had completed the two final tasks, one of the tasks would be randomly selected for payment.

In Task 18, we used a list to elicit a dictator-specific measure of the coefficient of loss aversion, λ.[17] The list had twenty-three decision rows. Each decision row was a choice between two Options (A and B). Option A, which was fixed across rows, was to keep current earnings from Tasks 1-17 for sure. Option B was to play a lottery that varied across rows. Specifically, the lottery offered a fifty percent chance of receiving an additional 10,000 COP and a fifty percent chance of losing part of current earnings. The potential loss decreased from 11,000 COP (first row) to 0 COP (last row), in steps of 500 COP.

From participants' decisions in Task 18, we estimate λ as follows. Let E denote a participant's earnings from Tasks 1-17. (These earnings are between 20,000 COP and 40,000 COP.) On the i^{th} row of the price list, a participant chooses between E and a 50-50 gamble $G(l_i)$ that pays either $E + 10000$ or $E - l_i$, where $l_i \in \{0, 500, 1000, ..., 11000\}$. Our key identifying assumption is that a participant takes current earnings as her reference point on each row. One possible justification for this assumption is that, presumably, E is the pay-

[16] One concern is that dictators might evaluate the possible payoffs in Task 10 relative to a reference point. For instance, because the recipient receives a final payoff of 20,000 COP for sure *unless* the dictator chooses Option B, dictators might consider a final payoff of 20,000 COP as the reference point for the recipient's payoff. This implies that a payoff of 0 COP to the recipient feels like a loss; therefore, a dictator's degree of loss aversion, λ, might also affect her valuation. Importantly, our social preferences model predicts that, holding the degree of loss aversion constant, valuations are still increasing in β. This means that, once we control for λ in the empirical analysis (using a measure that we describe below), valuations are still a good proxy for β. We follow this strategy in the tests of Proposition 5 that we report in Section 4.

[17] Similar incentivized tasks have been used in previous studies to obtain a measure of individual loss aversion. Our list draws on the lottery choice tasks used by Fehr and Goette (2007); Gächter, Johnson, and Herrmann (2010); Abeler et al. (2011); and Karle, Kirchsteiger, and Peitz (2015).

ment participants *expect* at the time they face this task. (Recall that Tasks 18 and 19 are a surprise to dictators.) This rationale is consistent with Kőszegi and Rabin's (2006, 2007) model of expectation-based reference-dependent preferences. Sprenger (2015) provides an alternative justification: the structure of Task 18 draws a participant's "first-focus" to E, since E is presented first and is the fixed element in the price list. This "first-focus" intuition is in line with the psychological literature on cognitive reference points (Rosch 1974) and decision anchoring. Because E is the referent on the i^{th} row, the Option B gamble yields either a gain of 10,000 COP (weighed by $\pi(0.5)$) or a loss of l_i COP (weighed by $1-\pi(0.5)$). Using the same structure we used to represent risk preferences in Section 2.2, we can write the utilities of the choice options as follows:

$$\begin{aligned} U(E|E) &= E \\ U(G(l_i)|E) &= E + \pi(0.5)\cdot 10000 - (1-\pi(0.5))\cdot l_i \\ &\quad + \eta\ \left[\pi(0.5)\cdot 10000 - (1-\pi(0.5))\cdot \lambda \cdot l_i\right]. \end{aligned}$$

The loss l^* that makes a participant indifferent between E and $G(l_i)$ satisfies $U(E|E) = U(G(l^*)|E)$. Using this indifference condition, and normalizing η to one, we obtain[18]

$$\lambda = \frac{20000\ \pi(0.5)}{(1-\pi(0.5))\ l^*} - 1. \tag{9}$$

Suppose the individual first switches from choosing E in Option A to $G(l_i)$ in Option B on the i^{th} row. Since the potential loss in Option B decreases as participants proceed down the rows, l^* falls between l_{i-1} and l_i. We estimate l^* as the midpoint, i.e., $\frac{l_{i-1}+l_i}{2}$.

Our test of Proposition 5 relies on the ranking of individual λ's rather than their value. However, if the value of $\pi(0.5)$ differs across individuals, the ranking of individual λ's based on (9) might be confounded by the ranking of $\pi(0.5)$. We, therefore, used Task 19 to pin down individual values of $\pi(0.5)$. Task 19 was a certainty equivalent task, designed in price list style with twenty-one rows. Each row was a choice between Option A, a lottery, and Option B, a certain amount that would be added to current earnings. The Option A lottery,

[18]Following Prospect Theory (Kahneman and Tversky 1979; Tversky and Kahneman 1992), Fehr and Goette (2007), Gächter, Johnson, and Herrmann (2010), and Karle, Kirchsteiger, and Peitz (2015) assumed that the reference point was a participant's initial wealth. When participants were given a budget to cover losses, as in Karle, Kirchsteiger, and Peitz (2015), it was implicitly assumed that participants integrated the budget with initial wealth. Consistent with original Prospect Theory, these authors also neglected consumption utility in the estimation of λ. Using their identification strategy in the current setting (which would include the assumption that participants integrate their earnings from Tasks 1-17 with their initial wealth), we would obtain that $U(E) = 0$ and $U(G(l_i)) = \eta\ [\pi(0.5)\cdot 10000 - (1-\pi(0.5))\cdot \lambda \cdot l_i]$. The indifference condition implies that $\lambda = \frac{10000\ \pi(0.5)}{(1-\pi(0.5))\ l^*}$. Importantly, this alternative approach yields the same ordering of the individual λ's as our identification strategy.

which was fixed across rows, offered a fifty percent chance of an additional 10,000 COP and a fifty percent chance of an additional 0 COP. The Option B certain amount increased from 0 COP (first row) to 10,000 COP (last row), in steps of 500 COP.

From participants' decisions in Task 19, we estimate their probability weights as follows. The i^{th} row of the price list is a choice between a 50-50 gamble G over $E + 10000$ and E, and a certain amount $E + c_i$, where $c_i \in \{0, 500, 1000, ..., 10000\}$. Kőszegi and Rabin's (2006, 2007) model suggests that the reference point could be current earnings, E; on the other hand, Sprenger's (2015) "first-focus" intuition suggests that the referent could be the gamble G, as it is the fixed element in the price list. Importantly, both assumptions about the reference point lead to the same measure of $\pi(0.5)$:

$$\pi(0.5) = \frac{c^*}{10000}, \tag{10}$$

where c^* is the certainty equivalent of the gamble G. Suppose the individual first switches from choosing G in Option A to $E + c_i$ in Option B on the i^{th} row. Since the certain amount in Option B increases as participants proceed down the rows, c^* falls between c_{i-1} and c_i. We estimate c^* as the midpoint, i.e., $\frac{c_{i-1}+c_i}{2}$. The last step is to combine (9) and (10) in order to estimate λ.

3.2.4 Additional dictator tasks

In Section 4.6, we use the data on dictators' choices in Tasks 1-9, our proxy for β, and our estimate of λ to test Proposition 5 on the effect of loss aversion on giving. There is, however, one potential confound that might affect our results. In a laboratory experiment, Exley (2016) showed that people sometimes use the risk that their donation may have less than the desired impact as an excuse to give less. If the dictators in our experiment use recipients' risk as an excuse to give less, and the excuse motive is correlated with dictators' loss aversion, then failure to control for the excuse motive might bias our results. Hence, drawing on Exley (2016), we also included a set of auxiliary tasks—Tasks 11-16—to measure excuse-driven risk preferences. We show in Appendix B.2 that our Proposition 5 test results are robust to accounting for excuse-driven risk preferences.

3.2.5 Recipients' tasks

Recipients also filled out decision forms using pen and paper. Following Brock, Lange, and Ozbay (2013), for each of Tasks 1-9, recipients indicated how many tokens they *believed* their dictator partner would allocate to them. For Task 10, recipients indicated which option (A or B) they *believed* their partner would choose on each row. Recipients also reported their beliefs about dictators' choices in some of the auxiliary tasks. Dictators did not learn recipients' beliefs, either between tasks or at the end of the session. We did not provide any monetary incentive for recipients to accurately report their true beliefs, but neither did the recipients have any obvious incentive to misreport their beliefs. We discuss recipients' beliefs in detail in Appendix C.

4 Results

4.1 Summary statistics of demographics and preference parameters

Table 2 shows the summary statistics for our full sample of dictators. The upper panel of the table shows the socio-economic characteristics of our sample. These include: gender; age; semester of study; whether a participant is an economics or finance major; whether a participant took part in previous studies at the Economics Laboratory at Universidad del Rosario; whether a participant is from Bogotá; and a participant's stratum, which is a proxy for family wealth in Colombia. Just over half of the dictators are economics or finance majors, nearly sixty percent are female, and more than eighty percent are from Bogotá. The median dictator is a twenty-one year old in her seventh semester at the University. Forty percent of dictators have previously participated in a study at the Economics Laboratory.

The lower panel shows the distributions of the preference parameters we elicit from the subjects. From Task 10, we find that the median dictator values the recipient's 20,000 COP the same as the dictator would value 6,000 COP of her own, leading to a value of our proxy for β equal to 0.28 ($=\frac{6{,}000-500}{20{,}000}$). Table 2 includes two measures of the dictator's loss aversion parameter. The first, $\widetilde{\lambda}$, is our "raw" measure of λ that is derived from the dictator's choice in Task 18 assuming no subjective probability weighting. The second, λ, which is our preferred measure, allows for the possibility of probability weighting by incorporating our measure of $\pi(0.5)$ elicited in Task 19. Both measures of loss aversion have medians between 3 and 4, consistent with many other measurements in the literature. These values suggest that the median dictator experiences losses two to three times more acutely than gains. Both measures also exhibit considerable dispersion and are skewed right. Our measure of subjective probability weighting at the probability one-half, $\pi(0.5)$, is tightly concentrated around 0.5. This suggests that most of our dictators do not distort probabilities near 0.5. However, given only one point on the weighting function for each dictator, we are unable to assess whether these dictators subjectively weigh probabilities away from 0.5.

[Table 2 about here]

In the sub-sections that follow, we present our main results both for the full sample of 110 dictators and for a restricted sample of 78 dictators with at most one switch point in each of Tasks 10, 18, and 19. These are the tasks that we use to elicit our measures of β, λ, and $\pi(0.5)$, and so we have more confidence in our measurements of these parameters within this sub-sample of dictators.[19]

4.2 Descriptive results

Before formally testing the propositions laid out in Section 2.3, we first report the raw distributions of tokens given in each of Tasks 1-9 in Figure 1. Each histogram in the figure corresponds to one of the nine dictator game tasks and shows the frequency with which each number of tokens (from 0 to 20) is given by our full sample of 110 dictators. Within each row, the baseline winning probability ($\frac{p}{100}$) is held constant, while the effectiveness of giving (ϕ) increases moving right across the row. Within each column, ϕ is held constant, while p increases as we move down the column.

[Figure 1 about here]

Comparisons among the histograms provide informal visual tests of Propositions 1-3. For example, Proposition 1 suggests that an increase in ϕ will increase the fraction of dictators giving more than zero tokens. Holding p constant and increasing ϕ (moving across a row), we do observe that some of the mass of the distribution shifts right, away from zero, consistent with this prediction. By contrast, the opposite occurs as we hold ϕ constant and increase p (moving down a column): the distribution appears to shift from right to left. This latter descriptive result is at odds with Proposition 3.[20]

Figure 1 also reveals that many dictators choose intermediate numbers of tokens between zero and twenty. We see considerable bunching at ten tokens, in particular.[21] This de-

[19]Multiple switching violates monotonicity in preferences. When considering the full sample of dictators, we follow Meier and Sprenger (2010), Sprenger (2015), and Exley (2016), among many others, by assuming that the first switch point of a multiple switcher is her true switch point.

[20]The histogram for Task 9 provides a direct test for a class of risk preferences that we ignore in our theoretical framework in Section 2. Note that Task 9 is the only task in which the dictator is able to guarantee the recipient a payoff of 20,000 COP by giving the full twenty tokens. The u-v preference models (Neilson 1992; Schmidt 1998; Diecidue et al. 2004) capture the intuition of Allais (1953) that when options are far from certain (as in Tasks 1-8), individuals act as expected utility maximizers but, when certainty is available (as in Task 9), it is disproportionately preferred. These models, therefore, predict a spike at twenty tokens in the distribution of tokens given in Task 9. This is clearly not borne out in the data, which indicates that u-v preferences do not play a role in the current setting.

[21]Only one dictator, however, gave ten tokens to the recipient in all tasks. This indicates that in the current setting, subjects do not regard equal division of the number of tokens as a compelling social norm—one that should be followed regardless of the values of p and ϕ (see, for instance, Andreoni and Bernheim [2002]).

scriptive evidence suggests some non-linearity in dictator decision-making. Taking a linear model literally, the only way to rationalize this evidence would be for all dictators who give intermediate amounts to be indifferent between all possible allocations between zero and twenty tokens. If this interpretation were correct, Proposition 2 implies that an increase in ϕ (holding constant the baseline winning probability) from, say, $\phi = 1$ to $\phi = 2$, should break the indifference and push all of the dictators who were giving intermediate amounts (when $\phi = 1$) to give $\min\{\tilde{x}, 20\}$ (when $\phi = 2$). (Recall that $\tilde{x}$ denotes the greatest number of tokens for which $U^{dic} \geq U^{rec}$.) Proposition 3 makes a similar prediction for p. The visual evidence suggests that neither of these predictions are borne out in the data, suggesting that the data are not well rationalized by a fully linear model and motivating our inclusion of two forms of non-linearity in our model of other-regarding preferences. We formally test these predictions below.

These patterns are also evident in Table 3, which shows, for each task (rows), the fraction of dictators giving a non-zero amount of tokens (first column) and the mean and percentiles of the distribution of tokens conditional on a positive amount given (remaining columns). We now formalize these comparisons in the next sub-sections.

[Table 3 about here]

4.3 Testing Proposition 1: the effect of ϕ on participation

Proposition 1 states that, all else equal, increasing the effectiveness of giving (i.e., increasing ϕ) will increase the number of dictators giving a non-zero number of tokens. This proposition holds regardless of reference point and even regardless of whether preferences are reference-dependent. It is therefore quite general and provides a useful check of our model of other-regarding preferences. We test this prediction using the following linear probability model:

$$\mathbb{I}\left(x_{ij} > 0\right) = \alpha_i + \beta_2 \mathbb{I}\left(\phi_j = 2\right) + \beta_3 \mathbb{I}\left(\phi_j = 3\right) + \gamma_{20} \mathbb{I}\left(p_j = 20\right) + \gamma_{40} \mathbb{I}\left(p_j = 40\right) + \epsilon_{ij}. \quad (11)$$

Subjects are indexed by i, and tasks are indexed by $j = 1, 2, ..., 9$. The notation $\mathbb{I}(A)$ represents an indicator variable that equals one if A is true and equals zero otherwise. For instance, the dependent variable $\mathbb{I}(x_{ij} > 0)$ equals one if the number of tokens x_{ij} given by individual i in task j is greater than zero and equals zero otherwise. When $x_{ij} > 0$, we say that individual i "participates" in task j. The variables ϕ_j and p_j are, respectively, the effectiveness of giving and the baseline probability that the recipient wins the lottery in task j. We include an individual fixed effect α_i to eliminate between-subject variation. This effectively makes the analysis a within-subject test of how participation varies with ϕ

and p. The coefficients of interest are β_2 and β_3, and the theoretical model suggests that $\beta_3 \geq \beta_2 \geq 0$.

The results for this test appear in the first two rows of columns (1) and (2) of Table 4. The first column contains the results from estimating equation (11) using our full sample of dictators, while the second column uses our restricted sample of dictators. In both cases, we find that more dictators give non-zero numbers of tokens in tasks where ϕ equals 2 or 3 relative to tasks in which ϕ equals 1: that is, $\beta_2 > 0$ and $\beta_3 > 0$, and both are significantly different from zero at least at the 5% level. While our estimates for β_3 are larger in magnitude than for β_2, statistically we cannot reject that the two estimates are equal. The p-values for these tests appear at the bottom of the table. Still, we take these results as evidence in support of Proposition 1 and of our model of other-regarding preferences.

[Table 4 about here]

4.4 Testing Propositions 2 and 3: the effects of ϕ and p on the number of tokens given with linear utility

Propositions 2 and 3 show the implications of a fully linear model of other-regarding preferences with no subjective probability weighting and in which inequality enters a dictator's overall utility function linearly. As we show in Proposition 2, under these assumptions, an increase in ϕ strictly increases the marginal benefit to the dictator of giving an additional token $\left(\frac{\partial W\left(x|R^{dic},R^{rec}\right)}{\partial x}\right)$. As we discuss in Proposition 3, the same logic applies to p for dictators with reference point $R^{rec}_{\hat{x}}$. (Changes in p should have no effect on giving for dictators with reference-independent preferences or reference points R^{rec}_{end} or $R^{rec}_{\hat{P}}$.) In a linear model, the effect of strictly increasing the marginal benefit of giving can push some dictators to prefer giving something rather than nothing (extensive margin), and it will push some indifferent dictators from giving an intermediate amount to giving the maximum amount (intensive margin).

We have already tested and confirmed the extensive margin prediction of Proposition 2. We test the extensive margin prediction of Proposition 3 in the same way using the same set of estimates of equation (11). In the context of that specification, Proposition 3 predicts $\gamma_{40} > \gamma_{20} > 0$ for dictators with reference point $R^{rec}_{\hat{x}}$ and $\gamma_{40} = \gamma_{20} = 0$ for all other dictators. We report the results in columns (1) and (2) of Table 4. We cannot reject the hypothesis that changing p has no effect on the extensive margin of giving. Under the assumption of a fully linear model, this finding is consistent with all reference points except $R^{rec}_{\hat{x}}$.

To test the intensive margin predictions of the two propositions, we estimate the following specification with OLS:

$$x_{ij} = \alpha_i + \beta_2 \mathbb{I}(\phi_j = 2) + \beta_3 \mathbb{I}(\phi_j = 3) + \gamma_{20} \mathbb{I}(p_j = 20) + \gamma_{40} \mathbb{I}(p_j = 40) + \epsilon_{ij}. \tag{12}$$

The variables and coefficients are as defined above. Because the number of tokens, x_{ij}, is censored at zero, we estimate the model using only observations in which a dictator gave a non-zero number of tokens. The coefficients of interest are β_2, β_3, γ_{20}, and γ_{40}. Proposition 2 predicts that $\beta_3 \geq \beta_2 \geq 0$, and Proposition 3 predicts $\gamma_{40} \geq \gamma_{20} \geq 0$.

The estimates are reported in columns (3) and (4) of Table 4. We find that the intensive margin predictions from both propositions are decisively rejected. Our estimates for β_2 and β_3 in columns (3) and (4) are both negative and significantly different from zero at the 1% level. Conditional on participation, increasing the effectiveness of giving from 1 lottery ticket per token to 2+ tickets per token tends to reduce the number of tokens given. With respect to Proposition 3, in columns (3) and (4), we find that the number of tokens given, conditional on participation, decreases monotonically as we increase p.[22] As shown in columns (5) and (6), we obtain similar intensive margin results when we restrict the sample to include only dictators who give non-zero amounts of tokens in all tasks.

These intensive margin results are a rejection of the joint hypothesis of (i) our model of other-regarding preferences with (ii) no subjective probability weighting, and in which (iii) dictator preferences are linear in inequality. At this point, we do not have enough information to formally test which component of the joint hypothesis fails. However, given our tests of Proposition 1 (above) and Proposition 5 (below), we believe the experimental data are consistent with our model of other-regarding preferences. Moreover, we note that the intensive margin predictions in Propositions 2 and 3 arise only under very stringent linearity assumptions about the dictator's preferences. Taken together, we view the results in this sub-section as a rejection of either (ii), (iii), or both.

4.5 Testing Proposition 4: the effect of the recipient's experimental endowment on giving

We use Proposition 4 to test the hypothesis that the dictator evaluates the recipient's payoff using gain-loss utility and specifically that the dictator perceives the recipient's experimental endowment as the reference point for the recipient's payoff (reference point R^{rec}_{end}). The theory predicts that dictators in the POSITIVE ENDOWMENT condition will give more tokens

[22]We have also estimated equations (11) and (12) using continuous measures of p (values 0, 20, 40) and ϕ (values 1, 2, 3) rather than dummy variables. The results are qualitatively similar to the results discussed above, and the conclusions regarding the propositions are unchanged.

than dictators in ZERO ENDOWMENT. This prediction holds for both the extensive and intensive margins.

We test Proposition 4 by pooling the data for all dictators and tasks and using multivariate regression models.[23] The results appear in Table 5. The six columns report the results of three different specifications, both with and without additional controls. In columns (1) and (2), we present the results from a Tobit model in which the dependent variable is x_{ij}, the number of tokens given by individual i in task j. x_{ij} is left-censored at 0 and right-censored at 20. In columns (3) and (4) are estimates from a linear probability model with dependent variable equal to one if the dictator gives a non-zero number of tokens and equal to zero otherwise. The last two columns contain estimates from a least squares regression of the number of tokens given conditional on giving a positive amount. Within each pair of columns, the first (odd columns) regress the dependent variable on a single regressor: a dummy that equals one if the dictator was assigned to the POSITIVE ENDOWMENT condition and equals zero otherwise. The second column in each pair (even columns) adds further demographic control variables. Because the condition to which the subject is assigned is fixed, testing Proposition 4 is a between-subjects test, and we cannot include individual fixed effects.

[Table 5 about here]

If a dictator perceived the recipient's endowment to be the reference point for the recipient's payoff, theory would predict a positive coefficient on the dummy variable for assignment to POSITIVE ENDOWMENT—dictators in that condition should give more tokens to recipients. The evidence in Table 5 says precisely the opposite. In all specifications in Table 5, the estimate for the coefficient on the POSITIVE ENDOWMENT condition dummy is negative and insignificant. We cannot reject the null hypothesis that the recipient's endowment has no effect on the number of tokens given by the dictator on either the extensive or intensive margins. This is a clear rejection of Proposition 4.[24] Our results are unchanged when we repeat the exercise for our restricted sample of dictators.

[23] In Appendix Table A1, we report results from non-parametric tests showing that dictators are broadly balanced on socio-economic characteristics and elicited parameters across experimental conditions. In only one instance do we find a significant difference, which is that more of the dictators in the POSITIVE ENDOWMENT condition are from economics or finance majors (chi-squared test of differences in proportions, p-value $= 0.022$). These results are confirmed by parametric tests. We estimated a linear probability model of the probability that a dictator is assigned to the POSITIVE ENDOWMENT condition, where the explanatory variables are the socio-economic characteristics and elicited preference parameters. The F-statistic in a test that the coefficients on all explanatory variables are jointly equal to zero is 1.123 (p-value $= 0.352$).

[24] These results are confirmed by non-parametric tests (two-sided tests of equality of proportions for the extensive margin and two-sided Wilcoxon rank-sum tests for the intensive margin). With regard to the extensive margin of giving, we observe one dictator game task (Task 9) in which participation by dictators from the ZERO ENDOWMENT condition was greater (p-value $= 0.07$), and we find no statistically meaningful

4.6 Testing Proposition 5: the effect of λ on participation

Proposition 5 is a prediction about how the extensive margin of giving is influenced by a dictator's degree of loss aversion and how that effect is mediated by the extent of the dictator's inequality aversion. Similar to Proposition 4, it applies only if dictators have reference-dependent preferences and are loss averse. Distinct from Proposition 4, however, it applies to all the reference points that we consider. The relationship between loss aversion and participation depends on the reference point for the dictator's payoff—whether $R^{dic} = R^{dic}_{wealth}$ or $R^{dic} = R^{dic}_{end}$. In particular, the proposition says that if $R^{dic} = R^{dic}_{wealth}$, the probability of dictator participation is weakly increasing in loss aversion. If, on the contrary, $R^{dic} = R^{dic}_{end}$, there exists a value $\widetilde{\beta}$ such that: if $\beta > \widetilde{\beta}$, then increasing λ makes participation *more* likely, and if $\beta \leq \widetilde{\beta}$, then increasing λ makes participation *less* likely. The intuition is that dictators who are not sufficiently averse to inequality will weigh their own losses (relative to their endowment) much more than they weigh the recipient's potential losses. Therefore, among these dictators, increasing loss aversion reduces participation. On the other hand, for dictators who are very inequality averse, the recipient's losses are more meaningful, and so more loss averse dictators will tend to participate more.

We test Proposition 5 using the following linear probability model of the probability that dictator i gives a non-zero amount of tokens in task j:

$$\mathbb{I}\left(x_{ij} > 0\right) = \alpha_0 \beta_i + \alpha_1 \lambda_i + \alpha_2 \left(\beta_i \times \lambda_i\right) + D_i' \delta + \epsilon_{ij}, \tag{13}$$

where β_i and λ_i are our elicited measures of guilt and loss aversion, respectively, for dictator i, and $\beta_i \times \lambda_i$ is their interaction. D_i is a vector of additional control variables for dictator i, including, in particular, our elicited measure of $\pi_i\,(0.5)$.[25] For these regressions, we have standardized our measures of λ_i and $\pi_i\,(0.5)$ by subtracting their means and dividing by their standard deviations.[26] Since we are interested in the effects of preference parameters, which

difference between the two groups in the remaining eight tasks (all p-values ≥ 0.268). With regard to the intensive margin, conditional on giving a non-zero amount, we find no statistically significant differences in the distributions of tokens given in any of the nine tasks (all p-values ≥ 0.124).

[25]The other control variables are the socio-economic characteristics of dictators and a constant. Across all econometric specifications, we find that both dictators who have participated in previous studies at the Economics Laboratory at Universidad del Rosario and dictators with an economics or finance major are less likely to contribute tokens to the recipient than are other dictators. (Interestingly, these patterns arise even though we are controlling for differences in the elicited preference parameters.) These results are in line with the general finding, reported by several studies, that economics students are less pro-social than other students (see, e.g., Bauman and Rose [2011] and references therein). Some of these studies have attempted to distinguish the effects of selection into an economics major from the effects of training (or indoctrination), which, of course, we cannot do in the current paper.

[26]The means and standard deviations used to standardize λ_i and $\pi_i\,(0.5)$ were computed using the restricted sample of dictators. We made this choice to facilitate comparability of estimates between the full

are constant for each dictator, our test uses between-dictator variation in participation. Our model of other-regarding preferences predicts that more inequality-averse dictators are more likely to give: $\alpha_0 > 0$. Proposition 5 predicts that $\alpha_2 > 0$. In addition, it predicts that if $R^{dic} = R^{dic}_{wealth}$, then $\alpha_1 = 0$; and if $R^{dic} = R^{dic}_{end}$, then $\alpha_1 < 0$. In case $R^{dic} = R^{dic}_{end}$, the threshold value of β (i.e., $\widetilde{\beta}$) can be computed from equation (13) as $\widetilde{\beta} = -\frac{\alpha_1}{\alpha_2}$.[27]

Of course, for the coefficients in equation (13) to be identified, ϵ_{ij} must be uncorrelated with the regressors. In principle, such a correlation might arise if the reference points that are used to evaluate payoffs vary across dictators and are correlated with a dictator's degree of loss aversion. If this were the case, the OLS estimates of α_1 and α_2 would be biased. This potential omitted variables bias cannot be eliminated by incorporating a dictator's reference point as an additional control variable in D_i, for reference points are not directly observable. The notion that λ and the reference point might be correlated, however, is not grounded in any major model of reference-dependent preferences; moreover, to the best of our knowledge, there is no empirical evidence that supports the existence of such a correlation. Therefore, we believe it is reasonable to assume that λ is uncorrelated with a dictator's reference point, which enables identification of α_1 and α_2.

Our OLS estimates of equation (13) appear in Tables 6 and 7. In Table 6, we use our preferred measure of λ that explicitly takes into account the possibility of non-linear probability weighting, and in Table 7, we use our "raw" measure $\widetilde{\lambda}$, which neglects deviations of $\pi(0.5)$ from one-half.[28] In both tables, we conduct the analysis for our full sample of 110 dictators and our restricted sample of 78 dictators. Recall that all dictators in the latter group had at most one switch point in each of Tasks 10, 18, and 19—the tasks used to elicit β, λ, and $\pi(0.5)$—so we are more confident in our elicited parameters for this sub-sample.

[Tables 6 and 7 about here]

First, we find a positive correlation between generosity in Task 10 (our proxy for β) and participation in the dictator games with risky outcomes. This finding is in line with Brock, Lange, and Ozbay's (2013) finding that generosity in the standard dictator game predicts giving in risky situations (see Result 2). Second, the remaining results in Tables 6 and 7 are generally supportive of Proposition 5. In all four sets of results (two samples × two measures

sample of dictators and the restricted sample.

[27] The effect of λ on giving is positive when $\frac{\partial}{\partial\lambda} E\left[\mathbb{I}(x_{ij} > 0)\,|\beta_i, \lambda_i, D_i\right] = \alpha_1 + \alpha_2\beta_i > 0$. Therefore the threshold $\widetilde{\beta}$ is defined by the equation: $\alpha_1 + \alpha_2\widetilde{\beta} = 0$. Re-arranging gives the result.

[28] Even in the presence of non-linear probability weighting, the effect of loss aversion should still be identified in the specifications with $\widetilde{\lambda}$ that include $\pi(0.5)$ as an additional control variable. (See columns (3) and (6) in Table 7.) In contrast, the estimate of the effect of $\pi(0.5)$ might be biased in a regression with $\widetilde{\lambda}$, since individual variation in $\pi(0.5)$ might be confounded with individual variation in λ that is not controlled for by $\widetilde{\lambda}$.

of λ), the estimate of α_2 is positive and the estimate of α_1 is negative; and in three of the four sets, the effects are statistically different from zero at either the 1% or 5% level. These results suggest that a dictator's loss aversion matters for participation and, in particular, that dictators perceive their endowment (including the pool of tokens) as the reference point for their own payoff.[29]

Taking our preferred set of estimates in columns (4)-(6) of Table 6, we see that without accounting for the interaction between inequality aversion and loss aversion (column (4)), our estimated average effect of λ is zero. Once the interaction is accounted for, however, the effect of λ is negative for dictators with weak inequality aversion and positive for dictators who are sufficiently inequality averse. Note the addition of both $\beta \times \lambda$ and $\pi(0.5)$ as explanatory variables appreciably increases the R^2. This indicates that accounting for the role of β in the relationship between loss aversion and participation and also for subjective probability weighting significantly adds explanatory power to the estimation. From the results in column (6), the threshold $\widetilde{\beta}$ is approximately $-\frac{(-.369)}{(0.824)} = 0.45$ (SE = .027). This threshold corresponds to a dictator who values the recipient's 20,000 COP as equivalent to about 9,500 COP of her own.

For more perspective on the results, consider Figure 2. The solid line in the figure shows the effect of a one-standard-deviation (1σ) change in λ on the probability of participation (y-axis) for different values of β (x-axis). The dashed lines give a 95% confidence interval. The solid line reaches zero at $\beta = \widetilde{\beta}$. For higher values of β, the line is above zero; for lower values, it is below zero. The figure reveals how the effect of λ goes from negative to positive as a dictator's degree of inequality aversion increases.

[Figure 2 about here]

To make the analysis still more concrete, we now compare the effect of a 1σ change in λ for two dictators: one with $\beta = .275$ (the median β) and another with $\beta = .725$ (the 90th percentile). For the median β dictator, a 1σ increase in λ causes a 14 percentage point *decrease* in participation (an 18% decline relative to the mean level of participation, 77%). For the high β dictator, on the other hand, the same 1σ increase in λ *increases* participation by 23 percentage points (a 29% increase). Both of these effects are statistically significant at the 1% level.

[29] Our interpretation of why the results for λ and $\beta \times \lambda$ are not significant in the full sample of dictators has to do with the fact that the error in the dictators' responses to Tasks 18 and 19 is greater in the full sample of dictators. Because λ is a function of the responses to both of these tasks, the inclusion of dictators with multiple switch points in the tasks seriously exacerbates the noisiness of this measure, attenuating the coefficient estimates. The problem is reduced in the restricted sample and also in our results with $\widetilde{\lambda}$, the "raw" version of λ.

Another interesting result in the tables is the finding that $\pi(0.5)$ is negatively associated with participation in all specifications. Taken at face value, this means that dictators who are more pessimistic in their subjective evaluation of a 50% chance of winning an individual prize are more likely to give. It is not obvious how to interpret this result more generally, however, because our measurement of the probability weighting function at a single point gives us very little information about its overall shape. We speculate that $\pi(0.5)$ might be a summary measure of the component of a dictator's risk attitudes that has to do with the treatment of probabilities. A dictator who is more pessimistic about the occurrence of a good outcome is, all else equal, more risk averse. Our results indicate that a dictator who is more risk averse in this sense is more willing to contribute tokens to the recipient. Interestingly, this empirical relationship between pessimism and giving is in line with our finding that loss aversion tends to increase participation provided that the dictator cares enough about the recipient's well-being. One way to unify the two findings is to note that among dictators with large values of β, increasing risk aversion (either through more pessimism or stronger loss aversion) raises participation.[30]

We report in Appendix B several robustness checks of our Proposition 5 test results. We examined their sensitivity to outliers in our preferred measure of λ (Appendix B.1), their robustness to accounting for excuse-driven risk preferences (Appendix B.2), and whether they hold up using Blanco, Engelmann, and Normann's (2011) alternative proxy for β (Appendix B.3). With the exception of the robustness check with the alternative proxy for β, we found our results to be very robust across specifications. Taken together, these results provide strong evidence that a dictator's pro-social behavior in environments with risk is influenced by her own risk aversion.

5 Conclusions

In this paper, we provided an initial characterization of the ways in which risk preferences and other-regarding preferences interact in the determination of giving behavior. We derived theoretical predictions, general to a broad array of social preferences models, for how loss aversion impacts giving behavior in risky environments, and we found strong support for these implications in data collected from a laboratory experiment. Our results indicate that pro-social behavior is yet another important domain in which risk attitudes—and reference-

[30]We can interpret the relationship between risk aversion and participation by appealing to the premise that the dictator projects her own risk preferences onto the recipient. Consider two dictators, one of which is more risk averse than the other. When the more-risk-averse dictator puts herself in the recipient's shoes, she has a stronger feeling that the recipient dislikes the risk involved in the lottery. This makes the more-risk-averse dictator more willing to give tokens in order to reduce the risk faced by the recipient.

dependence, in particular—appear to be significant determinants of behavior.

Much work still remains to be done to obtain a fuller picture of pro-social behavior under risk. By focusing on a setting in which the stakes are small, we abstracted from another important dimension of risk preferences: the diminishing marginal utility of wealth. However, when the social decision involves large-scale risk, the effect of the diminishing marginal utility of wealth on risk preferences may dominate the effect of gain-loss utility (Kőszegi and Rabin 2007, Section V). We can say little from our experiment about what would happen in such a high-stakes setting.

Another limitation of our work is that our dictator had no information about the risk attitudes of the recipient. While this feature helped to identify the role of the dictator's risk preferences, in many real-world analogs of our setting—for example, a physician performing a risky operation for a patient—the decision-maker may be better informed about the willingness of the recipient to take on risk. Recent research indicates that this kind of information does affect the behavior of the decision-maker (Freundt and Lange 2017). It has also been shown that individuals do use available information about others' risk attitudes when predicting a target's preferences, but their own risk preferences still have a strong influence on their predictions (Roth and Voskort 2014). This finding suggests that our assumption that the dictator projects her personal risk preferences onto the recipient applies more generally. The degree of projection, however, might vary across situations depending on the information available to the decision-maker. Such variation in the degree of projection, in turn, could affect the relationship between the decision-maker's risk preferences and her giving behavior. Exploring this issue further could be a fruitful avenue for future work.

In order to consider the simplest possible setting, in this paper, we considered only situations in which the decision-maker herself faces no risk. Further work will be needed to see whether and how the effect of risk attitudes is altered when the giver also faces risk (as in treatments T4 and T5 in Brock, Lange, and Ozbay [2013]).

By deliberately excluding strategic situations from our analysis, we were able to focus exclusively on the relation between risk preferences and distributional preferences. A limitation of this approach is that it leaves out situations in which the recipient's perception of the giver's fairness intentions might play a role. A class of models from which we have abstracted here (e.g., Rabin [1993]; Dufwenberg and Kirchsteiger [2004]; Falk and Fischbacher [2006]) focuses on the behavioral effects of perceived fairness intentions, and Falk, Fehr, and Fischbacher (2008) provided experimental evidence for the behavioral relevance of fairness attributions. In light of this work, another useful (but challenging) extension of our study would be to explore how the effect of risk attitudes on pro-social behavior is modified when perceived intentions matter.

Finally, our results on the importance of reference-dependence for giving raise an interesting question for future research: Is it possible to induce certain reference points in order to increase giving behavior? The answer could have implications for "nudging" individuals to act more pro-socially in certain settings. The literature as a whole contains few empirical results about where reference points come from or how to manipulate them.[31] We found little support for the idea that a recipient's experimental endowment induces a reference point in our data. Moreover, our attempt to manipulate reference points by varying the recipient's experimental endowment had little effect on giving behavior. Whether such a manipulation is possible and how to achieve it remains an open and interesting question.

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[31]Some examples of recent experimental studies that explicitly manipulated expectations and found that these manipulations affected reference points (in line with Kőszegi and Rabin's [2006, 2007] model) are Ericson and Fuster (2011), Abeler et al. (2011), Sprenger (2015), Song (2016), and Sautua (2017).

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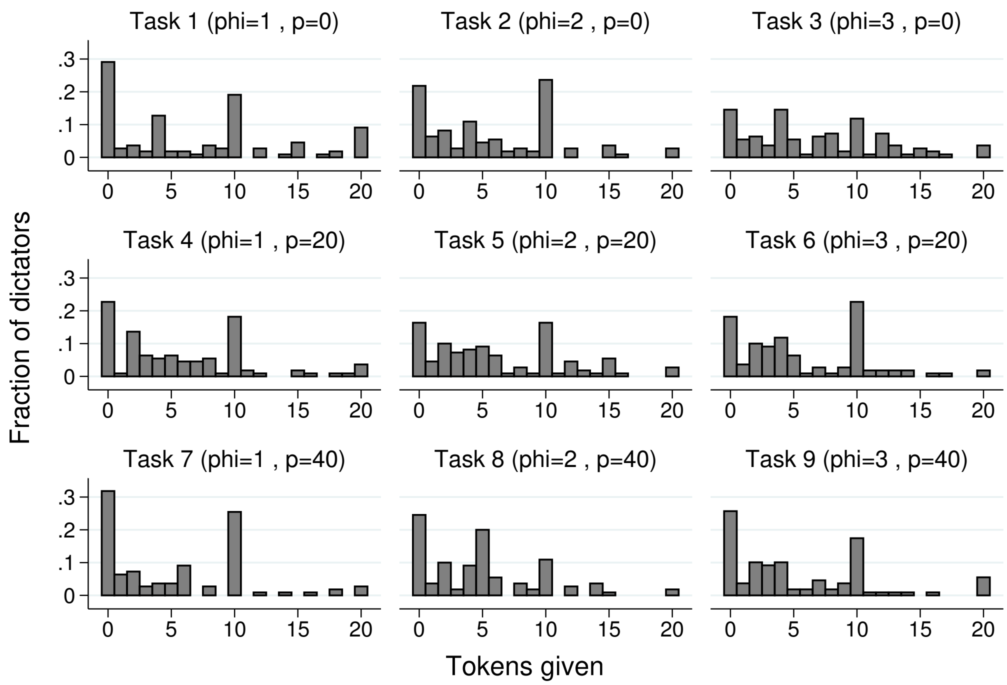
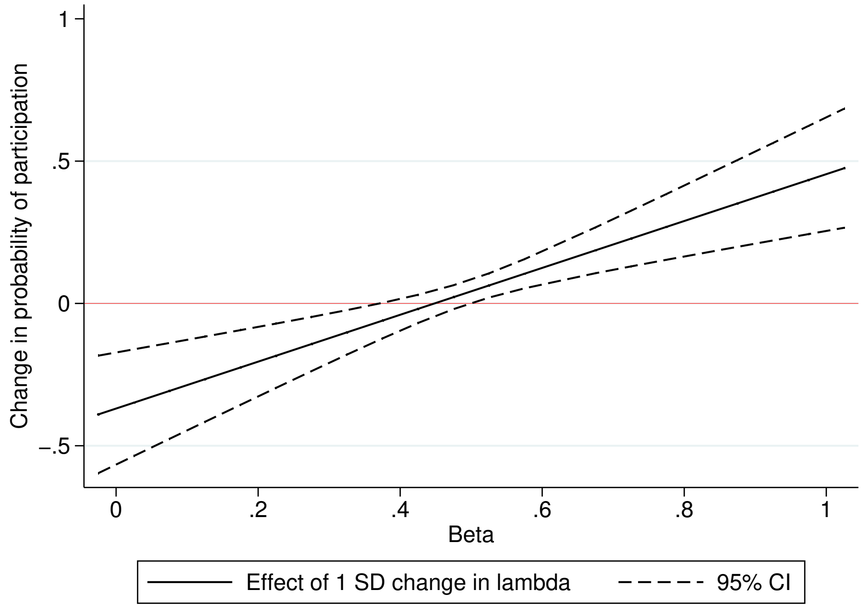
Figure 1: Histogram of tokens given by task.



Notes: This figure displays, for each of the nine dictator games, the frequency with which each number of tokens (from 0 to 20) is given by our full sample of 110 dictators. Each of the nine dictator games features a unique combination of p and ϕ, where $p \in \{0, 20, 40\}$ and $\phi \in \{1, 2, 3\}$. Within each row, the baseline winning probability ($\frac{p}{100}$) is held constant, while the effectiveness of giving (ϕ) increases moving right across the row. Within each column, ϕ is held constant, while p increases as we move down the column. One observation is missing for Task 9 because one dictator did not indicate the number of tokens given in the decision sheet for this task.

Figure 2: The effect of a one-standard-deviation change in λ for different values of β.



Notes: The solid line shows the effect of a one-standard-deviation change in λ on the probability of participation (y-axis) for different values of β (x-axis). For a dictator in the restricted sample with a guilt aversion parameter of β, such effect is given by $\hat{\alpha}_1 + \hat{\alpha}_2\beta$. $\hat{\alpha}_1$ and $\hat{\alpha}_2$ are the OLS estimates of the coefficients on λ and $\beta \times \lambda$ from equation (13) reported in column (6) of Table 6. The dashed lines give a 95% confidence interval.

Table 1: Design of dictator games with risky outcomes.

Task	Recipient's initial number of lottery tickets (p)	Ticket value of a token for recipient (ϕ)	Value of a token for dictator (in COP)
1	0	1	500
2	0	2	500
3	0	3	500
4	20	1	500
5	20	2	500
6	20	3	500
7	40	1	500
8	40	2	500
9	40	3	500

Notes: Dictators have twenty tokens to allocate. Recipient's face the gamble $(P(x) : 20000, 1 - P(x) : 0)$, where $P(x) = \frac{p+\phi x}{100}$ and x is the number of tokens allocated to the recipient by the dictator. For additional details on the experimental design, see Section 3.

Table 2: Summary statistics. Full sample of dictators.

	mean	sd	min	p25	p50	p75	p95	max
A. Socioeconomic Data								
Female	0.59	0.49	0	0	1	1	1	1
Economics/Finance Major	0.53	0.50	0	0	1	1	1	1
Previous Lab Experience	0.40	0.49	0	0	0	1	1	1
Bogotá	0.82	0.39	0	1	1	1	1	1
Age	20.7	3.16	17	19	21	22	24	38
Semester	5.89	2.81	1	4	7	8	10	10
Stratum	3.60	0.99	1	3	4	4	5	6
B. Elicited Parameters								
β	0.33	0.26	-0.025	0.12	0.28	0.47	0.93	1.02
$\widetilde{\lambda}$	6.45	14.2	-81	2.48	3.21	6.27	25.7	79
λ	15.2	53.5	-109.2	2.81	3.77	8.77	54.4	345.7
$\pi(0.5)$	0.50	0.18	0.025	0.47	0.47	0.57	0.88	0.98

Notes: Summary statistics for the full sample of 110 dictators. p25, p50, p75, and p95 are the 25th, 50th, 75th, and 95th percentiles. β is a measure of guilt aversion, λ and $\widetilde{\lambda}$ are measures of loss aversion, and $\pi(0.5)$ is a measure of subjective probability weighting at the probability one-half. For a discussion of how we elicit measures of these parameters, see Section 3.2.

Table 3: Distribution of tokens given by task

Task	ϕ	p	% Particip	Mean|>0	Min|>0	p25|>0	p50|>0	p75|>0	Max|>0
1	1	0	0.71	9.60	1	4	10	12	20
2	2	0	0.78	7.34	1	4	7	10	20
3	3	0	0.85	7.87	1	4	7.50	11	20
4	1	20	0.77	7.41	1	3	7	10	20
5	2	20	0.84	7.35	1	3	6	10	20
6	3	20	0.82	6.98	1	3	5.50	10	20
7	1	40	0.68	7.60	1	4	8	10	20
8	2	40	0.75	6.45	1	4	5	10	20
9	3	40	0.74	7.22	1	3	7	10	20

Notes: Summary statistics for the giving behavior of the full sample of 110 dictators. "% Particip" is the fraction of dictators giving more than zero tokens. The notation "|>0" means conditional on giving more than zero tokens. p25, p50, and p75 are the 25th, 50th, and 75th percentiles. ϕ determines the effectiveness of giving, and p determines the recipient's baseline winning probability. For additional details on the experimental design, see Section 3.

Table 4: Test of Propositions 1-3.

	(1)	(2)	(3)	(4)	(5)	(6)
	Participation		Tokens $\mid > 0$		Tokens $\mid$ Always Participate	
	Full Sample	Restricted	Full Sample	Restricted	Full Sample	Restricted
$\mathbb{I}(\phi = 2)$	0.070***	0.081***	-1.117***	-0.994***	-1.592***	-1.343***
	(0.021)	(0.024)	(0.226)	(0.273)	(0.256)	(0.290)
$\mathbb{I}(\phi = 3)$	0.083**	0.124***	-1.024***	-1.002***	-1.748***	-1.657***
	(0.032)	(0.037)	(0.271)	(0.357)	(0.301)	(0.409)
$\mathbb{I}(p = 20)$	0.027	0.013	-1.257***	-1.007***	-1.082**	-0.745
	(0.033)	(0.039)	(0.319)	(0.377)	(0.444)	(0.528)
$\mathbb{I}(p = 40)$	-0.056	-0.064	-1.951***	-1.650***	-2.320***	-2.049***
	(0.038)	(0.048)	(0.405)	(0.522)	(0.551)	(0.694)
Constant	0.731***	0.688***	9.305***	8.890***	10.794***	10.471***
	(0.028)	(0.032)	(0.302)	(0.385)	(0.396)	(0.486)
N	989	702	764	519	441	306
R^2	0.025	0.036	0.102	0.076	0.168	0.141
Test: $\mathbb{I}(\phi = 2) = \mathbb{I}(\phi = 3)$	0.551	0.134	0.631	0.974	0.506	0.284
Test: $\mathbb{I}(p = 20) = \mathbb{I}(p = 40)$	0.012	0.058	0.020	0.101	0.002	0.007

Notes: * p<.1, ** p<.05, *** p<.01. Standard errors are clustered by dictator and shown in parentheses. An observation is at the dictator-task level. Columns (1) and (2) display estimates of Equation (11). Columns (3) through (6) display estimates of Equation (12). All specifications include individual fixed effects. Participation equals one if a dictator gives more than zero tokens and equals zero otherwise. Tokens $\mid > 0$ is the number of tokens given conditional on giving a non-zero amount. The explanatory variables with labels of the form $\mathbb{I}(A)$ are indicator variables for different values of p and ϕ. They equal one if the expression A is true and equal zero otherwise. "Full Sample" refers to all 110 dictators. "Restricted" refers to the sub-sample of 78 dictators with a single switch point in each of Tasks 10, 18, and 19. Columns (5) and (6) limit the sample to dictators that give non-zero amounts in all nine dictator game tasks. The numbers in the final two rows of the table are p-values.

Table 5: Test of Proposition 4. Full sample of dictators.

	(1)	(2)	(3)	(4)	(5)	(6)
	Tokens		Participation		Tokens $\mid > 0$	
	Tobit	Tobit	OLS	OLS	OLS	OLS
POSITIVE condition	-1.287	-0.576	-0.047	-0.012	-0.827	-0.498
	(1.023)	(0.973)	(0.052)	(0.050)	(0.777)	(0.775)
Female		-0.205		0.033		-0.798
		(1.050)		(0.059)		(0.766)
Age		-0.320**		-0.009		-0.257***
		(0.127)		(0.007)		(0.093)
Semester		-0.290		-0.014		-0.146
		(0.177)		(0.012)		(0.132)
Economics/Finance Major		-2.955***		-0.108*		-2.042**
		(1.055)		(0.056)		(0.812)
Previous Lab Experience		-1.284		-0.108		-0.079
		(1.168)		(0.065)		(0.890)
Bogotá		0.311		0.052		-0.347
		(1.222)		(0.058)		(1.085)
Stratum		-0.260		-0.021		-0.032
		(0.581)		(0.036)		(0.420)
Constant	5.627***	16.451***	0.796***	1.152***	7.919***	15.781***
	(0.689)	(4.215)	(0.034)	(0.246)	(0.551)	(3.070)
N	989	989	989	989	764	764
R^2			0.003	0.060	0.007	0.076
pseudo R^2	0.002	0.018				

Notes: * p<.1, ** p<.05, *** p<.01. Standard errors are clustered by dictator and shown in parentheses. An observation is at the dictator-task level. Tokens (columns (1) & (2)) is the unconditional number of tokens given. Participation (columns (3) & (4)) equals one if a dictator gives more than zero tokens and equals zero otherwise. Tokens $\mid > 0$ (columns (5) & (6)) is the number of tokens given conditional on giving a non-zero amount. POSITIVE condition is an indicator variable that equals one if a dictator was assigned to the POSITIVE ENDOWMENT experimental condition and equals zero otherwise. Estimates are for the full sample of 110 dictators.

Table 6: Test of Proposition 5. Using preferred measure of λ.

	(1)	(2)	(3)	(4)	(5)	(6)
		All Dictators			Restricted Dictators	
	Participation	Participation	Participation	Participation	Participation	Participation
β	0.287***	0.318***	0.336***	0.331***	0.468***	0.452***
	(0.084)	(0.087)	(0.083)	(0.107)	(0.114)	(0.107)
λ	-0.000	-0.090	-0.043	-0.015	-0.455***	-0.369***
	(0.015)	(0.088)	(0.077)	(0.028)	(0.121)	(0.098)
$\beta \times \lambda$		0.220	0.213		0.894***	0.824***
		(0.174)	(0.153)		(0.236)	(0.194)
$\pi(0.5)$			-0.080***			-0.087**
			(0.022)			(0.033)
N	989	989	989	702	702	702
R^2	0.090	0.095	0.124	0.113	0.154	0.177

Notes: * p<.1, ** p<.05, *** p<.01. Standard errors are clustered by dictator and shown in parentheses. An observation is at the dictator-task level. Columns (3) and (6), respectively, report estimates of Equation (13) for the full sample of 110 dictators and the restricted sub-sample of 78 dictators with a single switch point in each of Tasks 10, 18, and 19. The other columns estimate variants of this equation that exclude particular variables. Participation is a binary variable that equals one if a dictator gives more than zero tokens and equals zero otherwise. The key explanatory variables are β, our preferred measure of guilt aversion; λ, our preferred measure of loss aversion; their interaction; and $\pi(0.5)$, a measure of subjective probability weighting at the probability one-half. λ and $\pi(0.5)$ are standardized by subtracting their means and dividing by their standard deviations (z-scores). All models include as additional explanatory variables a dictator's gender; age; semester of study; whether a participant is an economics or finance major; whether a participant took part in previous studies at the Economics Laboratory at Universidad del Rosario; whether a participant is from Bogotá; and a participant's stratum, which is a proxy for family wealth in Colombia, plus a constant.

Table 7: Test of Proposition 5. Using $\widetilde{\lambda}$, raw measure of λ.

	(1)	(2)	(3)	(4)	(5)	(6)
		All Dictators			Restricted Dictators	
	Participation	Participation	Participation	Participation	Participation	Participation
β	0.297***	0.330***	0.338***	0.320***	0.350***	0.342***
	(0.086)	(0.080)	(0.078)	(0.109)	(0.102)	(0.097)
$\widetilde{\lambda}$	0.014	-0.065	-0.081**	-0.017	-0.077**	-0.098**
	(0.030)	(0.042)	(0.037)	(0.031)	(0.038)	(0.038)
$\beta \times \widetilde{\lambda}$		0.333***	0.363***		0.273**	0.326**
		(0.123)	(0.116)		(0.128)	(0.126)
$\pi(0.5)$			-0.061***			-0.083**
			(0.020)			(0.033)
N	989	989	989	702	702	702
R^2	0.090	0.105	0.128	0.113	0.123	0.154

Notes: * p<.1, ** p<.05, *** p<.01. Standard errors are clustered by dictator and shown in parentheses. An observation is at the dictator-task level. Columns (3) and (6), respectively, report estimates of Equation (13) for the full sample of 110 dictators and the restricted sub-sample of 78 dictators with a single switch point in each of Tasks 10, 18, and 19. The other columns estimate variants of this equation that exclude particular variables. Participation is a binary variable that equals one if a dictator gives more than zero tokens and equals zero otherwise. The key explanatory variables are β, our preferred measure of guilt aversion; $\widetilde{\lambda}$, an alternative ("raw") measure of loss aversion; their interaction; and $\pi(0.5)$, a measure of subjective probability weighting at the probability one-half. $\widetilde{\lambda}$ and $\pi(0.5)$ are standardized by subtracting their means and dividing by their standard deviations (z-scores). All models include as additional explanatory variables a dictator's gender; age; semester of study; whether a participant is an economics or finance major; whether a participant took part in previous studies at the Economics Laboratory at Universidad del Rosario; whether a participant is from Bogotá; and a participant's stratum, which is a proxy for family wealth in Colombia, plus a constant.

Appendix

A Proofs of Propositions 1-5

In this appendix, we provide the proofs of Propositions 1-5. First, we prove the results for the Fehr-Schmidt inequality aversion model discussed in the main text, which is based exclusively on ex-ante comparisons of utilities. Second, we show all the results remain true if the Fehr-Schmidt inequality aversion model allows for both ex-ante and ex-post comparisons of utilities. Third, we show all the results hold for Charness and Rabin's (2002) model of social-welfare or quasi-maximin preferences, as well as for the Egocentric Altruism Model (Cox, Friedman, and Gjerstad 2007).

In the proofs of all propositions other than Proposition 4, we exploit that $R^{rec}_{end} = R^{rec}_{\hat{P}}$ when (i) the recipient is endowed with 0 COP and $\hat{P} = 0$, or (ii) the recipient is endowed with 20,000 COP and $\hat{P} = 1$. We provide proofs for $R^{rec}_{\hat{P}}$ for any $\hat{P} \in [0, 1]$. Due to the relationship between R^{rec}_{end} and $R^{rec}_{\hat{P}}$, the proof for $R^{rec}_{\hat{P}}$ when $\hat{P} = 0$ or $\hat{P} = 1$ applies exactly to R^{rec}_{end}. In the proof of Proposition 4, given R^{rec}_{end}, we compare behavior across the two possible values of the recipient's endowment.

A.1 Inequality aversion model; ex-ante comparisons of utilities

Proof of Proposition 1.

We want to show that $\frac{\partial}{\partial \phi}\left(\frac{\partial W(x|R^{dic}, R^{rec})}{\partial x}|_{x=0}\right) > 0$ for $(R^{dic}, R^{rec}) \in \{R^{dic}_{wealth}, R^{dic}_{end}\} \times \{R^{rec}_{\hat{P}}, R^{rec}_{\hat{x}}\}$. It follows from (8) that

$$\frac{\partial}{\partial \phi}\left(\frac{\partial W(x|R^{dic}, R^{rec})}{\partial x}|_{x=0}\right) = -\,\beta\,\gamma\,(\gamma-1)\left[I(0|R^{dic}, R^{rec})\right]^{\gamma-2}\frac{\partial I(x|R^{dic}, R^{rec})}{\partial \phi}|_{x=0}\frac{\partial I(x|R^{dic}, R^{rec})}{\partial x}|_{x=0}$$
$$-\,\beta\,\gamma\,\left[I(0|R^{dic}, R^{rec})\right]^{\gamma-1}\frac{\partial^2 I(x|R^{dic}, R^{rec})}{\partial \phi \partial x}|_{x=0}.$$

Suppose $R^{dic} \in \{R^{dic}_{wealth}, R^{dic}_{end}\}$. Using expressions (3)-(6), it is straightforward to check that:

(i) $\frac{\partial I(x|R^{dic}, R^{rec})}{\partial x}|_{x=0} < 0$ for $R^{rec} \in \{R^{rec}_{\hat{P}}, R^{rec}_{\hat{x}}\}$;

(ii) $\frac{\partial I(x|R^{dic}, R^{rec})}{\partial \phi}|_{x=0} = 0$ for $R^{rec} \in \{R^{rec}_{\hat{P}}\}$ and $\frac{\partial I(x|R^{dic}, R^{rec})}{\partial \phi}|_{x=0} \geq 0$ for $R^{rec} \in \{R^{rec}_{\hat{x}}\}$ $\Big($when $R^{rec} \in \{R^{rec}_{\hat{x}}\}$, $\frac{\partial I(x|R^{dic}, R^{rec})}{\partial \phi}|_{x=0} = 0$ if $\hat{x} = 0$ and $\frac{\partial I(x|R^{dic}, R^{rec})}{\partial \phi}|_{x=0} > 0$ if $\hat{x} > 0\Big)$;

(iii) $\frac{\partial^2 I(x|R^{dic}, R^{rec})}{\partial \phi \partial x}|_{x=0} < 0$ for $R^{rec} \in \{R^{rec}_{\hat{P}}, R^{rec}_{\hat{x}}\}$.

Note (i) and (ii) imply that the first term on the right-hand side of the above expression is non-negative; (iii) implies that the second term is strictly positive. Hence, $\frac{\partial}{\partial \phi}\left(\frac{\partial W(x|R^{dic}, R^{rec})}{\partial x}|_{x=0}\right) > 0$. QED

Proof of Proposition 2.

Suppose $\pi(z) = z$ for all $z \in [0,1]$, $\gamma = 1$, and $R^{dic} \in \{R^{dic}_{wealth}, R^{dic}_{end}\}$. We want to show that $\frac{\partial}{\partial \phi}\left(\frac{\partial W(x|R^{dic},R^{rec})}{\partial x}\right) > 0$ for $R^{rec} \in \{R^{rec}_{\hat{P}}, R^{rec}_{\hat{x}}\}$. From (8), we obtain

$$\frac{\partial}{\partial \phi}\left(\frac{\partial W(x|R^{dic},R^{rec})}{\partial x}\right) = -\beta \, \frac{\partial^2 I(x|R^{dic},R^{rec})}{\partial \phi \partial x}.$$

Using expressions (3)-(6), we get

$$\frac{\partial^2 I(x|R^{dic},R^{rec})}{\partial \phi \partial x} = \begin{cases} -200 \ \left[1+\eta \ \left(1+(\lambda-1)\hat{P}\right)\right] & \text{if } R^{rec} = R^{rec}_{\hat{P}} \\ -200 \ \left\{1+\eta \ (1+(\lambda-1) \ P(\hat{x})) + \phi \ \eta \ (\lambda-1) \ \frac{\hat{x}}{100}\right\} & \text{if } R^{rec} = R^{rec}_{\hat{x}}. \end{cases}$$

Note $\frac{\partial^2 I(x|R^{dic},R^{rec})}{\partial \phi \partial x} < 0$ for $R^{rec} \in \{R^{rec}_{\hat{P}}, R^{rec}_{\hat{x}}\}$. Hence, $\frac{\partial}{\partial \phi}\left(\frac{\partial W(x|R^{dic},R^{rec})}{\partial x}\right) > 0$ for $R^{rec} \in \{R^{rec}_{\hat{P}}, R^{rec}_{\hat{x}}\}$. This implies that the amount of tokens allocated to the recipient is weakly increasing in ϕ. QED

Proof of Proposition 3.

Suppose $\pi(z) = z$ for all $z \in [0,1]$, $\gamma = 1$, and $R^{dic} \in \{R^{dic}_{wealth}, R^{dic}_{end}\}$. We want to show that $\frac{\partial}{\partial p}\left(\frac{\partial W(x|R^{dic},R^{rec})}{\partial x}\right) \geq 0$ for $R^{rec} \in \{R^{rec}_{\hat{P}}, R^{rec}_{\hat{x}}\}$. From (8), we obtain

$$\frac{\partial}{\partial p}\left(\frac{\partial W(x|R^{dic},R^{rec})}{\partial x}\right) = -\beta \, \frac{\partial^2 I(x|R^{dic},R^{rec})}{\partial p \partial x}.$$

Using expressions (3)-(6), we get

$$\frac{\partial^2 I(x|R^{dic},R^{rec})}{\partial p \partial x} = \begin{cases} 0 & \text{if } R^{rec} = R^{rec}_{\hat{P}} \\ -2 \ \phi \ \eta \ (\lambda-1) \leq 0 & \text{if } R^{rec} = R^{rec}_{\hat{x}}. \end{cases}$$

(Note $\frac{\partial^2 I(x|R^{dic},R^{rec})}{\partial p \partial x} < 0$ if $R^{rec} = R^{rec}_{\hat{x}}$, $\eta > 0$, and $\lambda > 1$.) Hence, $\frac{\partial}{\partial p}\left(\frac{\partial W(x|R^{dic},R^{rec})}{\partial x}\right) \geq 0$ for $R^{rec} \in \{R^{rec}_{\hat{P}}, R^{rec}_{\hat{x}}\}$. This implies that the amount of tokens allocated to the recipient is weakly increasing in p. QED

Proof of Proposition 4.

For part (a), note that $U^{rec}(x|R^{rec})$ is unaffected by the recipient's endowment if $R^{rec} \in \{R^{rec}_{\hat{P}}, R^{rec}_{\hat{x}}\}$, which implies that the dictator chooses the same allocation regardless of the recipient's endowment.

For part (b), consider (8), which represents the marginal utility of a token allocated to the recipient. Given $R^{rec} = R^{rec}_{end}$, $\eta > 0$, and $\lambda > 1$, we show that $\frac{\partial W(x|.,20000)}{\partial x} > \frac{\partial W(x|.,0)}{\partial x}$. If the recipient is endowed with 20,000 COP, then, using (2), we have that

$$I(x|.,20000) = U^{dic}(x|.) - 20000\left[\pi\left(P(x)\right)\ (1+\eta\lambda) - \eta\lambda\right]$$

and

$$\frac{\partial I(x|.,20000)}{\partial x} = \frac{\partial U^{dic}(x|.)}{\partial x} - 200\pi^{'}\left(P(x)\right)\phi(1+\eta\lambda).$$

If, instead, the recipient is endowed with 0 COP,

$$I(x|.,0) = U^{dic}(x|.) - 20000\pi\left(P(x)\right)(1+\eta)$$

and

$$\frac{\partial I(x|.,0)}{\partial x} = \frac{\partial U^{dic}(x|.)}{\partial x} - 200\pi^{'}\left(P(x)\right)\phi(1+\eta).$$

Because $I(x|.,20000) > I(x|.,0)$ and $\left|\frac{\partial I(x|.,20000)}{\partial x}\right| > \left|\frac{\partial I(x|.,0)}{\partial x}\right|$, using (8) we conclude that $\frac{\partial W(x|.,20000)}{\partial x} > \frac{\partial W(x|.,0)}{\partial x}$. Therefore, the dictator allocates more tokens to the recipient when the recipient is endowed with 20,000 COP than she does when the recipient is endowed with 0 COP. QED

Proof of Proposition 5.

For $R^{rec} \in \{R^{rec}_{\hat{P}}, R^{rec}_{\hat{x}}\}$, $\eta > 0$, and $\lambda > 1$, we evaluate how λ affects the marginal utility of the first token allocated to the recipient, which is captured by $\frac{\partial}{\partial\lambda}\left(\frac{\partial W(x|R^{dic},R^{rec})}{\partial x}|_{x=0}\right)$. We show how $\frac{\partial}{\partial\lambda}\left(\frac{\partial W(x|R^{dic},R^{rec})}{\partial x}|_{x=0}\right)$ changes depending on whether $R^{dic} = R^{dic}_{wealth}$ or $R^{dic} = R^{dic}_{end}$.

(i) $R^{rec} = R^{rec}_{\hat{P}}$ **:**

From (3), (5), (6), and (8), we obtain

$$\frac{\partial}{\partial\lambda}\left(\frac{\partial W(x|R^{dic},R^{rec}_{\hat{P}})}{\partial x}|_{x=0}\right) = \begin{cases} -\beta\ \gamma\ I(0|R^{dic}_{wealth},R^{rec}_{\hat{P}})^{\gamma-1}\ A & \text{if } R^{dic} = R^{dic}_{wealth} \\ -500\ \eta - \beta\ \gamma\ I(0|R^{dic}_{end},R^{rec}_{\hat{P}})^{\gamma-1}\ B & \text{if } R^{dic} = R^{dic}_{end}, \end{cases}$$

where:

$$A := (\gamma-1)I(0|R^{dic}_{wealth},R^{rec}_{\hat{P}})^{-1}\left[\frac{\partial I(0|R^{dic}_{wealth},R^{rec}_{\hat{P}})}{\partial\lambda}\right]\left[\frac{\partial I(0|R^{dic}_{wealth},R^{rec}_{\hat{P}})}{\partial x}\right]+\left[\frac{\partial^2 I(0|R^{dic}_{wealth},R^{rec}_{\hat{P}})}{\partial\lambda\partial x}\right];$$

$$B := (\gamma - 1) I(0|R^{dic}_{end}, R^{rec}_{\hat{P}})^{-1} \left[\frac{\partial I(0|R^{dic}_{end}, R^{rec}_{\hat{P}})}{\partial \lambda} \right] \left[\frac{\partial I(0|R^{dic}_{end}, R^{rec}_{\hat{P}})}{\partial x} \right] + \left[\frac{\partial^2 I(0|R^{dic}_{end}, R^{rec}_{\hat{P}})}{\partial \lambda \partial x} \right].$$

Because $\frac{\partial I(0|.,R^{rec}_{\hat{P}})}{\partial \lambda} \geq 0$, $\frac{\partial I(0|.,R^{rec}_{\hat{P}})}{\partial x} < 0$, and $\frac{\partial^2 I(0|R^{dic}_{end},R^{rec}_{\hat{P}})}{\partial \lambda \partial x} \leq 0$, we have that $A \leq 0$ and $B \leq 0$. We thus have that $\frac{\partial}{\partial \lambda} \left(\frac{\partial W(x|R^{dic},R^{rec}_{\hat{P}})}{\partial x}|_{x=0} \right)$ is weakly increasing in β regardless of the dictator's reference point.

Consider the case in which $R^{dic} = R^{dic}_{wealth}$. If $\hat{P} = 0$, the marginal utility of the first token allocated to the recipient is unaffected by λ. Thus, participation is unaffected by λ. If, instead, $\hat{P} \in (0, 1]$, the marginal utility of the first token allocated to the recipient is strictly increasing in λ for all $\beta > 0$. This implies that the likelihood of participation is weakly increasing in λ for all $\beta > 0$.

Now suppose $R^{dic} = R^{dic}_{end}$. If $\hat{P} = 0$, the marginal utility of the first token allocated to the recipient is strictly decreasing in λ for all $\beta > 0$. This implies that the likelihood of participation is weakly decreasing in λ for all $\beta > 0$. (Thus, $\tilde{\beta}_{R^{rec}_{\hat{P}}} = 1$ in this case.) If, instead, $\hat{P} \in (0, 1]$, the marginal utility of the first token allocated to the recipient is increasing in λ if, and only if, $\beta > \frac{500\ \eta}{-\gamma\ I(0|R^{dic}_{end},R^{rec}_{\hat{P}})^{\gamma-1}\ B}$. This implies that the likelihood of participation weakly increases with λ for $\beta > \frac{500\ \eta}{-\gamma\ I(0|R^{dic}_{end},R^{rec}_{\hat{P}})^{\gamma-1}\ B}$ and weakly decreases with λ for $\beta \leq \frac{500\ \eta}{-\gamma\ I(0|R^{dic}_{end},R^{rec}_{\hat{P}})^{\gamma-1}\ B}$.

(ii) $R^{rec} = R^{rec}_{\hat{x}}$:

Note for any $R^{rec}_{\hat{x}}$, we can find p, ϕ, and $\hat{P}$ such that $R^{rec}_{\hat{x}} = R^{rec}_{\hat{P}}$ for $\hat{P} = P(\hat{x})$. This implies that, when $R^{rec} = R^{rec}_{\hat{x}}$, the relationship between λ and participation is the same as that when $R^{rec} = R^{rec}_{\hat{P}}$. QED

A.2 Inequality aversion model; ex-post comparisons of utilities

Suppose that, instead of caring about ex-ante inequality, the dictator cares exclusively about ex-post inequality. She compares her individual utility to the recipient's utility for each of the two possible lottery outcomes, and then weighs inequality in each scenario by the probability of occurrence of the scenario. Thus, the dictator's overall utility, based on ex-post comparisons, is

$$\begin{aligned} W^{ex\ post}(x|R^{dic}, R^{rec}) = U^{dic}(x|R^{dic}) - \beta\ \pi\left(P(x)\right) \cdot I(x, 20000|R^{dic}, R^{rec})^{\gamma} \\ - \beta\ \left(1 - \pi\left(P(x)\right)\right) \cdot I(x, 0|R^{dic}, R^{rec})^{\gamma}, \end{aligned} \tag{14}$$

where: $I(x, 20000|R^{dic}, R^{rec}) := U^{dic}(x|R^{dic}) - \left[20000 + \sum_r \mu(20000 - r)\pi(q(r))\right]$;

$I(x, 0|R^{dic}, R^{rec}) := U^{dic}(x|R^{dic}) - \sum_r \mu(0-r)\,\pi(q(r))$. More generally, the dictator might care about both ex-ante and ex-post inequality. Following Fudenberg and Levine (2012) and Brock, Lange, and Ozbay (2013), we allow both types of inequality to enter the overall utility function through a weighted average:

$$W(x|R^{dic}, R^{rec}) = \psi\ W^{ex\ ante}(x|R^{dic}, R^{rec}) + (1-\psi)\ W^{ex\ post}(x|R^{dic}, R^{rec}),$$

where $W^{ex\ ante}(.)$ is the overall utility function introduced in the main text (see (7)), and $\psi \in [0,1]$. Next, we show that Propositions 1-5 hold for $W^{ex\ post}(x|R^{dic}, R^{rec})$, too. This, in turn, implies that they hold for $W(x|R^{dic}, R^{rec})$.

Proof of Proposition 1.

We want to show that $\frac{\partial}{\partial\phi}\left(\frac{\partial W^{ex\ post}(x|R^{dic}, R^{rec})}{\partial x}|_{x=0}\right) > 0$ for $(R^{dic}, R^{rec}) \in \{R^{dic}_{wealth}, R^{dic}_{end}\} \times \{R^{rec}_{\hat{P}}, R^{rec}_{\hat{x}}\}$. Using (14), we obtain

$$\frac{\partial}{\partial\phi}\left(\frac{\partial W^{ex\ post}(x|.,.)}{\partial x}|_{x=0}\right) = -\beta\ \frac{\pi'\left(\frac{p}{100}\right)}{100}\ \left[I(0,20000|.,.)^{\gamma} - I(0,0|.,.)^{\gamma} + A\right] \qquad (15)$$
$$+\beta\ \gamma\ (\gamma-1)\ \left|\frac{\partial U^{dic}(x|.)}{\partial x}\right|\ B,$$

where:

$A := \phi\ \gamma\ \left[I(0,20000|.,.)^{\gamma-1}\ \frac{\partial I(0,20000|.,.)}{\partial\phi} - I(0,0|.,.)^{\gamma-1}\ \frac{\partial I(0,0|.,.)}{\partial\phi}\right]$;

$B := \pi\left(\frac{p}{100}\right)\ I(0,20000|.,.)^{\gamma-2}\ \frac{\partial I(0,20000|.,.)}{\partial\phi} + \left(1-\pi\left(\frac{p}{100}\right)\right)\ I(0,0|.,.)^{\gamma-2}\ \frac{\partial I(0,0|.,.)}{\partial\phi}$.

If $R^{rec} = R^{rec}_{\hat{P}}$, then $I(x,.|.,R^{rec})$ is unaffected by ϕ, which implies that $A = B = 0$. Therefore, (15) reduces to

$$\frac{\partial}{\partial\phi}\left(\frac{\partial W^{ex\ post}(x|.,R^{rec}_{\hat{P}})}{\partial x}|_{x=0}\right) = -\beta\ \frac{\pi'\left(\frac{p}{100}\right)}{100}\ \left[I(0,20000|.,R^{rec}_{\hat{P}})^{\gamma} - I(0,0|.,R^{rec}_{\hat{P}})^{\gamma}\right].$$

Since $I(x,20000|.,R^{rec}_{\hat{P}}) < I(x,0|.,R^{rec}_{\hat{P}})$, we obtain $\frac{\partial}{\partial\phi}\left(\frac{\partial W^{ex\ post}(x|.,R^{rec}_{\hat{P}})}{\partial x}|_{x=0}\right) > 0$.

If $R^{rec} = R^{rec}_{\hat{x}}$,

$$I(x,20000|.,R^{rec}_{\hat{x}}) = U^{dic}(x|.) - 20000\ \left[1+\eta\left(1-\pi\left(P(\hat{x})\right)\right)\right];$$
$$I(x,0|.,R^{rec}_{\hat{x}}) = U^{dic}(x|.) + 20000\ \pi\left(P(\hat{x})\right)\ \eta\lambda.$$

Since $I(x, 20000|., R^{rec}_{\hat{x}}) < I(x, 0|., R^{rec}_{\hat{x}})$ and $0 \leq \frac{\partial I(x,20000|.,R^{rec}_{\hat{x}})}{\partial \phi} \leq \frac{\partial I(x,0|.,R^{rec}_{\hat{x}})}{\partial \phi}$, the first term on the right-hand side of (15) is strictly positive and the second term is larger than or equal to zero. Therefore, we conclude that $\frac{\partial}{\partial \phi}\left(\frac{\partial W^{ex\ post}(x|.,R^{rec}_{\hat{x}})}{\partial x}|_{x=0}\right) > 0$. QED

Proofs of Propositions 2 and 3.

First, suppose $\gamma = 1$. It is straightforward to check that this implies that $W^{ex\ ante}(x|R^{dic}, R^{rec}) = W^{ex\ post}(x|R^{dic}, R^{rec})$. Hence, if we additionally assume that $\pi(z) = z$, the proofs of Propositions 2-3 for $W^{ex\ ante}(x|R^{dic}, R^{rec})$ hold exactly for $W^{ex\ post}(x|R^{dic}, R^{rec})$, too. QED

Proof of Proposition 4.

The argument for part (a) is essentially the same as the one for ex-ante comparisons of utilities. With regard to part (b), given $R^{rec} = R^{rec}_{end}$, $\eta > 0$, and $\lambda > 1$, we show below that $\frac{\partial W^{ex\ post}(x|.,20000)}{\partial x} > \frac{\partial W^{ex\ post}(x|.,0)}{\partial x}$.

If the recipient's endowment is 20,000 COP, the dictator's overall utility is

$$\begin{aligned} W^{ex\ post}(x|., 20000) = {} & U^{dic}(x|.) - \beta\ \pi\left(P(x)\right) \cdot \left(U^{dic}(x|.) - 20000\right)^{\gamma} \\ & - \beta\ \left(1 - \pi\left(P(x)\right)\right) \cdot \left(U^{dic}(x|.) + 20000\ \eta\lambda\right)^{\gamma}. \end{aligned}$$

Similarly, if the recipient's endowment is 0 COP, the dictator's overall utility is

$$\begin{aligned} W^{ex\ post}(x|., 0) = {} & U^{dic}(x|.) - \beta\ \pi\left(P(x)\right) \cdot \left(U^{dic}(x|.) - 20000\ (1+\eta)\right)^{\gamma} \\ & - \beta\ \left(1 - \pi\left(P(x)\right)\right) \cdot U^{dic}(x|.)^{\gamma}. \end{aligned}$$

From the above expressions, we obtain

$$\begin{aligned} \frac{\partial W^{ex\ post}(x|., 20000)}{\partial x} &= \frac{\partial U^{dic}(x|.)}{\partial x} + \beta\ [-A + B + C + D] \\ \frac{\partial W^{ex\ post}(x|., 0)}{\partial x} &= \frac{\partial U^{dic}(x|.)}{\partial x} + \beta\ [-E + F + G + H], \end{aligned}$$

where:
$A := \pi'\left(P(x)\right) \frac{\phi}{100} \left(U^{dic}(x|.) - 20000\right)^{\gamma}$;
$B := \pi\left(P(x)\right) \gamma \left(U^{dic}(x|.) - 20000\right)^{\gamma-1} \left|\frac{\partial U^{dic}(x|.)}{\partial x}\right|$;
$C := \pi'\left(P(x)\right) \frac{\phi}{100} \left(U^{dic}(x|.) + 20000\ \eta\lambda\right)^{\gamma}$;
$D := \left(1 - \pi\left(P(x)\right)\right) \gamma \left(U^{dic}(x|.) + 20000\ \eta\lambda\right)^{\gamma-1} \left|\frac{\partial U^{dic}(x|.)}{\partial x}\right|$;
$E := \pi'\left(P(x)\right) \frac{\phi}{100} \left(U^{dic}(x|.) - 20000\ (1+\eta)\right)^{\gamma}$;

$F := \pi\left(P(x)\right)\,\gamma\,\left(U^{dic}(x|.) - 20000\,(1+\eta)\right)^{\gamma-1}\,\left|\frac{\partial U^{dic}(x|.)}{\partial x}\right|;$
$G := \pi'\left(P(x)\right)\,\frac{\phi}{100}\,U^{dic}(x|.)^{\gamma};$
$H := \left(1-\pi\left(P(x)\right)\right)\,\gamma\,U^{dic}(x|.)^{\gamma-1}\,\left|\frac{\partial U^{dic}(x|.)}{\partial x}\right|.$

Then, $\frac{\partial W^{ex\ post}(x|.,20000)}{\partial x} - \frac{\partial W^{ex\ post}(x|.,0)}{\partial x} = \beta\left[-(A-E)+(B-F)+(C-G)+(D-H)\right]$. It is straighforward to check that $B-F \geq 0$, $D-H \geq 0$, and $C-G > A-E > 0$. This implies that $\frac{\partial W^{ex\ post}(x|.,20000)}{\partial x} - \frac{\partial W^{ex\ post}(x|.,0)}{\partial x} > 0$. Therefore, the dictator allocates more tokens to the recipient when the recipient is endowed with 20,000 COP than she does when the recipient is endowed with 0 COP. QED

Proof of Proposition 5.

For $R^{rec} \in \{R^{rec}_{\hat{P}}, R^{rec}_{\hat{x}}\}$, $\eta > 0$, and $\lambda > 1$, we evaluate how λ affects the marginal utility of the first token allocated to the recipient, which is captured by $\frac{\partial}{\partial\lambda}\left(\frac{\partial W^{ex\ post}(x|R^{dic},R^{rec})}{\partial x}|_{x=0}\right)$. We show how $\frac{\partial}{\partial\lambda}\left(\frac{\partial W^{ex\ post}(x|R^{dic},R^{rec})}{\partial x}|_{x=0}\right)$ changes depending on whether $R^{dic} = R^{dic}_{wealth}$ or $R^{dic} = R^{dic}_{end}$.

(i) $R^{rec} = R^{rec}_{\hat{P}}$**:**

$$\frac{\partial}{\partial\lambda}\left(\frac{\partial W^{ex\ post}(x|R^{dic},R^{rec}_{\hat{P}})}{\partial x}|_{x=0}\right) = \begin{cases} \beta\gamma A & \text{if } R^{dic} = R^{dic}_{wealth} \\ -500\eta + \beta\gamma\,(B+C) & \text{if } R^{dic} = R^{dic}_{end}, \end{cases}$$

where:
$A := \frac{\partial I(x,0|R^{dic}_{wealth},R^{rec}_{\hat{P}})}{\partial\lambda}|_{x=0}\cdot I(0,0|R^{dic}_{wealth},R^{rec}_{\hat{P}})^{\gamma-1}\cdot\ [\pi'\left(\frac{p}{100}\right)\,\frac{\phi}{100}$
$+\left(1-\pi\left(\frac{p}{100}\right)\right)\,(\gamma-1)\,I(0,0|R^{dic}_{wealth},R^{rec}_{\hat{P}})^{-1}\left|\frac{\partial I(x,0|R^{dic}_{wealth},R^{rec}_{\hat{P}})}{\partial x}|_{x=0}\right|];$
$B := \left[\pi\left(\frac{p}{100}\right)\,I(0,20000|R^{dic}_{end},R^{rec}_{\hat{P}})^{\gamma-1} + \left(1-\pi\left(\frac{p}{100}\right)\right)\,I(0,0|R^{dic}_{end},R^{rec}_{\hat{P}})^{\gamma-1}\right]\,500\eta;$
$C := \frac{\partial I(x,0|R^{dic}_{end},R^{rec}_{\hat{P}})}{\partial\lambda}|_{x=0}\cdot I(0,0|R^{dic}_{end},R^{rec}_{\hat{P}})^{\gamma-1}\cdot\ [\pi'\left(\frac{p}{100}\right)\,\frac{\phi}{100}$
$+\left(1-\pi\left(\frac{p}{100}\right)\right)\,(\gamma-1)\,I(0,0|R^{dic}_{end},R^{rec}_{\hat{P}})^{-1}\left|\frac{\partial I(x,0|R^{dic}_{end},R^{rec}_{\hat{P}})}{\partial x}|_{x=0}\right|].$

If we normalize $\eta \leq 0.5$, then $I(0,20000|R^{dic}_{end},R^{rec}_{\hat{P}}) \geq 0$ and, hence, $B > 0$. In addition, because $\frac{\partial I(x,0|.,R^{rec}_{\hat{P}})}{\partial\lambda}|_{x=0} = 20000\,\eta\,\pi(\hat{P}) \geq 0$ and $I(0,0|.,R^{rec}_{\hat{P}}) > 0$, we have that $A \geq 0$ and $C \geq 0$. Hence, $\frac{\partial}{\partial\lambda}\left(\frac{\partial W^{ex\ post}(x|R^{dic},R^{rec}_{\hat{P}})}{\partial x}|_{x=0}\right)$ is increasing in β.

Consider the case in which $R^{dic} = R^{dic}_{wealth}$. If $\hat{P} = 0$, the marginal utility of the first token allocated to the recipient is unaffected by λ. If, instead, $\hat{P} \in (0,1]$, the marginal utility of the first token allocated to the recipient is strictly increasing in λ for all $\beta > 0$. This implies that the likelihood of participation is weakly increasing in λ for all $\beta > 0$.

If $R^{dic} = R^{dic}_{end}$, the marginal utility of the first token allocated to the recipient is increasing in λ if, and only if, $\beta > \frac{500\ \eta}{\gamma\ (F+G)}$. This implies that the likelihood of participation weakly increases with λ for $\beta > \frac{500\ \eta}{\gamma\ (F+G)}$ and weakly decreases with λ for $\beta \leq \frac{500\ \eta}{\gamma\ (F+G)}$.

(ii) $R^{rec} = R^{rec}_{\hat{x}}$**:**

The argument is the same as the one for the inequality aversion model with ex-ante comparisons of utilities (see Appendix A.1). QED

A.3 Other models of other-regarding preferences

Social-welfare or quasi-maximin preferences (Charness and Rabin 2002)

The dictator's overall utility function is

$$W_{CR}(x|R^{dic}, R^{rec}) = (1-\beta)\ U^{dic}(x|R^{dic}) \qquad (16)$$
$$+ \beta\ \left[\delta\ \min\left\{U^{dic}(x|R^{dic}), U^{rec}(x|R^{rec})\right\} + (1-\delta)\ \left(U^{dic}(x|R^{dic}) + U^{rec}(x|R^{rec})\right)\right],$$

where $U^{dic}(x|R^{dic})$ is the dictator's individual utility, as defined in (5) and (6) in the main text; and $U^{rec}(x|R^{rec})$ is the recipient's ex-ante utility, as defined in (2), (3), and (4) in the main text. The parameter $\beta \in (0,1)$ measures the degree of concern for social welfare versus own well-being. The parameter $\delta \in [0,1]$ measures the degree of concern for helping the worst-off person versus maximizing the total social surplus. Setting $\delta = 1$ corresponds to (conditional) maximin preferences, whereas setting $\delta = 0$ corresponds to total-surplus maximization.

First, note that in the current setting, $\min\left\{U^{dic}(x|R^{dic}), U^{rec}(x|R^{rec})\right\} = U^{rec}(x|R^{rec})$. Hence, (16) reduces to

$$W_{CR}(x|R^{dic}, R^{rec}) = (1-\beta\delta)\ U^{dic}(x|R^{dic}) + \beta\ U^{rec}(x|R^{rec}).$$

If $\delta = 1$, $W_{CR}(x|R^{dic}, R^{rec})$ is isomorphic to $W^{ex\ ante}(x|R^{dic}, R^{rec})$ when $\gamma = 1$. Then, Propositions 1-5 follow directly. It is straightforward to verify that Propositions 1-4 also hold if $\delta \in [0,1)$. Below, we show that Proposition 5 holds, too.

Proof of Proposition 5.

(i) $R^{rec} = R^{rec}_{\hat{P}}$**:**

$$\frac{\partial}{\partial \lambda}\left(\frac{\partial W_{CR}(x|R^{dic}, R^{rec}_{\hat{P}})}{\partial x}|_{x=0}\right) = \begin{cases} \beta\ \left[200\ \pi'(\frac{p}{100})\ \phi\ \pi(\hat{P})\ \eta\right] & \text{if } R^{dic} = R^{dic}_{wealth} \\ 100\eta\ \left[-5\ + \beta\ \left(5\ \delta + 2\ \pi'(\frac{p}{100})\ \phi\ \pi(\hat{P})\right)\right] & \text{if } R^{dic} = R^{dic}_{end}. \end{cases}$$

$\frac{\partial}{\partial \lambda}\left(\frac{\partial W_{CR}(x|R^{dic},R^{rec}_{\hat{P}})}{\partial x}|_{x=0}\right)$ is weakly increasing in β.

Consider the case in which $R^{dic} = R^{dic}_{wealth}$. If $\hat{P} = 0$, the marginal utility of the first token allocated to the recipient is unaffected by λ. If, instead, $\hat{P} \in (0,1]$, the marginal utility of the first token allocated to the recipient is strictly increasing in λ for all $\beta > 0$. This implies that the likelihood of participation is weakly increasing in λ for all $\beta > 0$.

Now suppose $R^{dic} = R^{dic}_{end}$. If $\hat{P} = 0$, the marginal utility of the first token allocated to the recipient is strictly decreasing in λ for all $\beta > 0$. This implies that the likelihood of participation is weakly decreasing in λ for all $\beta > 0$. If, instead, $\hat{P} \in (0,1]$, the marginal utility of the first token allocated to the recipient is increasing in λ if, and only if, $\beta > \frac{5}{5\ \delta+2\ \pi'(\frac{p}{100})\ \phi\ \pi(\hat{P})}$. This implies that the likelihood of participation weakly increases with λ for $\beta > \frac{5}{5\ \delta+2\ \pi'(\frac{p}{100})\ \phi\ \pi(\hat{P})}$ and weakly decreases with λ for $\beta \leq \frac{5}{5\ \delta+2\ \pi'(\frac{p}{100})\ \phi\ \pi(\hat{P})}$.

(iii) $R^{rec} = R^{rec}_{\hat{x}}$**:**

The argument is the same as the one for the inequality aversion model with ex-ante comparisons of utilities (see Appendix A.1). QED

Egocentric Altruism Model (Cox, Friedman, and Gjerstad 2007)

The dictator's overall utility function is

$$W_{CFG}(x|R^{dic},R^{rec}) = \begin{cases} \frac{1}{\gamma}\left[U^{dic}(x|R^{dic})^{\gamma} + \beta\ (U^{rec}(x|R^{rec})+k)^{\gamma}\right] & \text{if } \gamma \in (-\infty,0)\cup(0,1] \\ U^{dic}(x|R^{dic})\ (U^{rec}(x|R^{rec})+k)^{\beta} & \text{if } \gamma = 0, \end{cases} \tag{17}$$

where $U^{dic}(x|R^{dic})$ is the dictator's individual utility, as defined in (5) and (6) in the main text; $U^{rec}(x|R^{rec})$ is the recipient's ex-ante utility, as defined in (2), (3), and (4) in the main text; and $k > -U^{rec}(0|R^{rec})$. Like in the inequality aversion model, $\beta \in (0,1]$.[1]

Proof of Proposition 1.

(i) $R^{rec} = R^{rec}_{\hat{P}}$:

From (3), (5), (6), and (17), we obtain

$$\frac{\partial}{\partial \phi}\left(\frac{\partial W_{CFG}(x|R^{dic},R^{rec}_{\hat{P}})}{\partial x}|_{x=0}\right) = \begin{cases} \beta\ (U^{rec}(0|R^{rec}_{\hat{P}})+k)^{\gamma-1}\ A & \text{if } \gamma \in (-\infty,0)\cup(0,1] \\ \beta\ U^{dic}(0|R^{dic})\ (U^{rec}(0|R^{rec}_{\hat{P}})+k)^{\beta-1}\ A & \text{if } \gamma = 0, \end{cases}$$

[1]In the original formulation of the model, $k = 0$. The issue here is that $U^{rec}(0|R^{rec})$ could be smaller than or equal to zero for some reference points and values of the risk parameters. The restriction $k > -U^{rec}(0|R^{rec})$ guarantees that $(U^{rec}(x|R^{rec})+k)^{\gamma}$ is well defined for any $\gamma \in (-\infty,1]$.

where $A := 200\,\pi^{'}(\frac{p}{100})\,\left[1+\eta\;(1+\pi(\hat{P})\;(\lambda-1))\right]$. Therefore, $\frac{\partial}{\partial\phi}\left(\frac{\partial W_{CFG}(x|R^{dic},R^{rec}_{\hat{P}})}{\partial x}|_{x=0}\right) > 0$.

(i) $R^{rec} = R^{rec}_{\hat{x}}$**:**

Let $B := 1+\,\eta\,[1+\pi(P(\hat{x}))\;(\lambda-1)]$. If $\gamma \in (-\infty,0)\cup(0,1]$, using (4), (5), (6), and (17), we obtain

$$\frac{\partial}{\partial\phi}\left(\frac{\partial W_{CFG}(x|R^{dic},R^{rec}_{\hat{x}})}{\partial x}|_{x=0}\right) = \beta\;(\gamma-1)\;(U^{rec}(0|R^{rec}_{\hat{x}})+k)^{\gamma-2}\;\frac{\partial U^{rec}(0|R^{rec}_{\hat{x}})}{\partial\phi}\;\frac{\partial U^{rec}(x|R^{rec}_{\hat{x}})}{\partial x}|_{x=0}$$
$$+\,\beta\;(U^{rec}(0|R^{rec}_{\hat{x}})+k)^{\gamma-1}\;\frac{\partial}{\partial\phi}\left(\frac{\partial U^{rec}(x|R^{rec}_{\hat{x}})}{\partial x}|_{x=0}\right),$$

where:
$\frac{\partial U^{rec}(0|R^{rec}_{\hat{x}})}{\partial\phi} = -200\;\eta\;\pi^{'}(P(\hat{x}))\;\hat{x}\;\left(\lambda\;\left(1-\pi(\frac{p}{100})\right)+\pi(\frac{p}{100})\right) \leq 0;$
$\frac{\partial U^{rec}(x|R^{rec}_{\hat{x}})}{\partial x}|_{x=0} = 200\;\phi\;\pi^{'}(\frac{p}{100})\;B > 0;$
$\frac{\partial}{\partial\phi}\left(\frac{\partial U^{rec}(x|R^{rec}_{\hat{x}})}{\partial x}|_{x=0}\right) = 200\;\pi^{'}(\frac{p}{100})\;\left[B+\phi\;\pi^{'}(P(\hat{x}))\;\frac{\hat{x}}{100}\;\eta\;(\lambda-1)\right] > 0.$
Hence, $\frac{\partial}{\partial\phi}\left(\frac{\partial W_{CFG}(x|R^{dic},R^{rec}_{\hat{x}})}{\partial x}|_{x=0}\right) > 0$.

If $\gamma = 0$, consider the log transformation of $W_{CFG}(x|R^{dic},R^{rec}_{\hat{x}})$: $\tilde{W}_{CFG}(x|R^{dic},R^{rec}_{\hat{x}}) = \log(U^{dic}(x|R^{dic})) + \beta\log(U^{rec}(x|R^{rec}_{\hat{x}})+k)$. It follows that $\frac{\partial}{\partial\phi}\left(\frac{\partial\tilde{W}_{CFG}(x|R^{dic},R^{rec}_{\hat{x}})}{\partial x}|_{x=0}\right) = \beta\;(U^{rec}(0|R^{rec}_{\hat{x}})+k)^{-1}\left[-(U^{rec}(0|R^{rec}_{\hat{x}})+k)^{-1}\;\frac{\partial U^{rec}(0|R^{rec}_{\hat{x}})}{\partial\phi}\;\frac{\partial U^{rec}(x|R^{rec}_{\hat{x}})}{\partial x}|_{x=0}+\frac{\partial}{\partial\phi}\left(\frac{\partial U^{rec}(x|R^{rec}_{\hat{x}})}{\partial x}|_{x=0}\right)\right]$.
Hence, $\frac{\partial}{\partial\phi}\left(\frac{\partial\tilde{W}_{CFG}(x|R^{dic},R^{rec}_{\hat{x}})}{\partial x}|_{x=0}\right) > 0$. QED

Proofs of Propositions 2 and 3.

If $\gamma = 1$, then $W_{CFG}(x|R^{dic},R^{rec}) = U^{dic}(x|R^{dic}) + \beta\;U^{rec}(x|R^{rec})$. With the additional assumption that $\pi(z) = z$, the proofs of Propositions 2-3 for the inequality aversion model also apply here. QED

Proof of Proposition 4.

The argument for part (a) is essentially the same as the one for the inequality aversion model. With regard to part (b), given $R^{rec} = R^{rec}_{end}$, $\eta > 0$, and $\lambda > 1$, we show below that $\frac{\partial W_{CFG}(x|.,20000)}{\partial x} > \frac{\partial W_{CFG}(x|.,0)}{\partial x}$.

If $\gamma \in (-\infty, 0) \cup (0, 1]$, using (17) we obtain

$$\frac{\partial W_{CFG}(x|., 20000)}{\partial x}|_{x=0} - \frac{\partial W_{CFG}(x|., 0)}{\partial x}|_{x=0} = \beta \; \frac{1}{(U^{rec}(0|20000) + k)^{1-\gamma}} \frac{\partial U^{rec}(x|20000)}{\partial x}|_{x=0} - \beta \; \frac{1}{(U^{rec}(0|0) + k)^{1-\gamma}} \frac{\partial U^{rec}(x|0)}{\partial x}|_{x=0}.$$

Since $U^{rec}(0|20000) < U^{rec}(0|0)$, we have that $\frac{1}{(U^{rec}(0|20000)+k)^{1-\gamma}} > \frac{1}{(U^{rec}(0|0)+k)^{1-\gamma}}$. In addition, from (2) we obtain $\frac{\partial U^{rec}(x|20000)}{\partial x}|_{x=0} > \frac{\partial U^{rec}(x|0)}{\partial x}|_{x=0}$. Putting these inequalities together, we conclude that $\frac{\partial W_{CFG}(x|.,20000)}{\partial x}|_{x=0} - \frac{\partial W_{CFG}(x|.,0)}{\partial x}|_{x=0} > 0$.

If $\gamma = 0$, consider the log transformation of $W_{CFG}(x|., R^{rec}_{end})$: $\tilde{W}_{CFG}(x|., R^{rec}_{end}) = \log(U^{dic}(x|.)) + \beta \log(U^{rec}(x|R^{rec}_{end}) + k)$. It follows that

$$\frac{\partial \tilde{W}_{CFG}(x|., 20000)}{\partial x}|_{x=0} - \frac{\partial \tilde{W}_{CFG}(x|., 0)}{\partial x}|_{x=0} = \beta \; (U^{rec}(0|20000) + k)^{-1} \frac{\partial U^{rec}(x|20000)}{\partial x}|_{x=0} - \beta \; (U^{rec}(0|0) + k)^{-1} \frac{\partial U^{rec}(x|0)}{\partial x}|_{x=0}.$$

Again, we conclude that $\frac{\partial \tilde{W}_{CFG}(x|.,20000)}{\partial x}|_{x=0} - \frac{\partial \tilde{W}_{CFG}(x|.,0)}{\partial x}|_{x=0} > 0$. QED

Proof of Proposition 5.

(i) $R^{rec} = R^{rec}_{\hat{P}}$

If $\gamma \in (-\infty, 0) \cup (0, 1]$*:*

Using (3), (5), (6), and (17), we obtain

$$\frac{\partial}{\partial \lambda}\left(\frac{\partial W_{CFG}(x|R^{dic}, R^{rec}_{\hat{P}})}{\partial x}|_{x=0}\right) = \begin{cases} \beta A & \text{if } R^{dic} = R^{dic}_{wealth} \\ -\frac{500\eta}{30000^{1-\gamma}} + \beta A & \text{if } R^{dic} = R^{dic}_{end}, \end{cases}$$

where:

$A := (U^{rec}(0|R^{rec}_{\hat{P}}) + k)^{\gamma-1} \, 200 \, \pi'(\frac{p}{100}) \, \phi \, \pi(\hat{P}) \, \eta \left[(1-\gamma)(U^{rec}(0|R^{rec}_{\hat{P}}) + k)^{-1} \; 20000 \; \left(1 - \pi(\frac{p}{100})\right) \; B + 1\right]$

$B := 1 + \eta \left[1 + \pi(\hat{P}) \; (\lambda - 1)\right]$.

Because $A \geq 0$, $\frac{\partial}{\partial \lambda}\left(\frac{\partial W_{CFG}(x|., R^{rec}_{\hat{P}})}{\partial x}|_{x=0}\right)$ is weakly increasing in β.

Consider the case in which $R^{dic} = R^{dic}_{wealth}$. If $\hat{P} = 0$, the marginal utility of the first token allocated to the recipient is unaffected by λ. If, instead, $\hat{P} \in (0, 1]$, the marginal utility of the first token allocated to the recipient is strictly increasing in λ for all $\beta > 0$. This implies that the likelihood of participation is weakly increasing in λ for all $\beta > 0$.

If $R^{dic} = R^{dic}_{end}$, the marginal utility of the first token allocated to the recipient is increasing in λ if, and only if, $\beta > \frac{500\eta}{30000^{1-\gamma}\ A}$. This implies that the likelihood of participation weakly increases with λ for $\beta > \frac{500\eta}{30000^{1-\gamma}\ A}$ and weakly decreases with λ for $\beta \leq \frac{500\eta}{30000^{1-\gamma}\ A}$.

If $\gamma = 0$*:*

Consider the log transformation of $W_{CFG}(x|R^{dic}, R^{rec}_{end})$: $\tilde{W}_{CFG}(x|R^{dic}, R^{rec}_{\hat{P}}) = \log(U^{dic}(x|R^{dic}))+ \beta \log(U^{rec}(x|R^{rec}_{\hat{P}}) + k)$. It follows that

$$\frac{\partial}{\partial \lambda}\left(\frac{\partial \tilde{W}_{CFG}(x|R^{dic}, R^{rec}_{\hat{P}})}{\partial x}|_{x=0}\right) = \begin{cases} \beta C & \text{if } R^{dic} = R^{dic}_{wealth} \\ -\frac{\eta}{60} + \beta C & \text{if } R^{dic} = R^{dic}_{end}, \end{cases}$$

where

$C := (U^{rec}(0|R^{rec}_{\hat{P}})+k)^{\gamma-1}\, 200\, \pi'(\frac{p}{100})\, \phi\, \pi(\hat{P})\, \eta \left[(U^{rec}(0|R^{rec}_{\hat{P}}) + k)^{-1}\, 20000\, \left(1 - \pi(\frac{p}{100})\right)\, B + 1\right]$ (and B is the same as when $\gamma \in (-\infty, 0) \cup (0, 1]$).

Because $C \geq 0$, $\frac{\partial}{\partial \lambda}\left(\frac{\partial \tilde{W}_{CFG}(x|R^{dic}, R^{rec}_{\hat{P}})}{\partial x}|_{x=0}\right)$ is weakly increasing in β.

Consider the case in which $R^{dic} = R^{dic}_{wealth}$. If $\hat{P} = 0$, the marginal utility of the first token allocated to the recipient is unaffected by λ. If, instead, $\hat{P} \in (0, 1]$, the marginal utility of the first token allocated to the recipient is strictly increasing in λ for all $\beta > 0$. This implies that the likelihood of participation is weakly increasing in λ for all $\beta > 0$.

If $R^{dic} = R^{dic}_{end}$, the marginal utility of the first token allocated to the recipient is increasing in λ if, and only if, $\beta > \frac{\eta}{60\ C}$. This implies that the likelihood of participation weakly increases with λ for $\beta > \frac{\eta}{60\ C}$ and weakly decreases with λ for $\beta \leq \frac{\eta}{60\ C}$.

(ii) $R^{rec} = R^{rec}_{\hat{x}}$**:**

The argument is the same as the one for the inequality aversion model with ex-ante comparisons of utilities (see Appendix A.1). QED

B Robustness of our Proposition 5 test results

B.1 Transformations of λ

In this appendix, we demonstrate the robustness of our Proposition 5 test results to different transformations of the key explanatory variable, λ. This exercise is designed to address concerns that our results are being driven by outlier measurements of λ. The other variables are as described in the main text.

Appendix Tables A2 and A3 present these robustness checks for our restricted and full samples of dictators, respectively. The first two columns of each table, labeled "Baseline," repeat the original results from the main text. The next two columns, labeled "T/B Code," show the results when we top/bottom code λ at its 95th/5th percentiles *before* standardizing.

The next two columns, labeled "IHS," take the inverse hyperbolic sine of λ before standardizing.[2] The following two columns, labeled "Rank," discard the cardinal information contained in λ and rank each dictator in ascending order of λ (1 is the smallest). The regressor is the standardization of the rank. The last two columns, labeled "High/Low," classify dictators into two groups: those with λ above the median and those with λ below (or equal to) the median. The regressor is an indicator that equals one if the dictator is in the "high" category.

The results in the main text hold up fairly well under these transformations. (In fact, the results for the full sample of dictators in Appendix Table A3 are much stronger using the transformed measures of λ than the original results in the main text.) In all instances, the interaction term $\beta \times \lambda$ is positive and significant, consistent with the dictator evaluating recipient utility in terms of gains and losses. The effect of λ for more inequality-tolerant dictators is negative in all specifications though it is not significant when $\pi(0.5)$ is included in some of the robustness checks.[3] Generally, we view the results as evidence that our conclusions regarding Proposition 5 are robust. Importantly, we are confident that our results are not driven by outlier values of λ.[4]

B.2 Accounting for excuse-driven risk preferences

In this appendix, we evaluate the extent to which excuse-driven risk preferences affect giving in our dictator games with risky outcomes. We first discuss a dictator-specific measure of excuse-driven risk preferences. We then describe the main features of such a measure in our data. Last, we demonstrate that taking such a measure into account in our test of Proposition 5 does not alter the results of this test.

B.2.1 Eliciting a measure of excuse-driven risk preferences

To elicit a dictator-specific measure of excuse-driven risk preferences, we used Tasks 11-16, which we adapted from Exley (2016). In the following description of these tasks, we draw heavily on Exley's terminology and notation. Tasks 11-16 elicited dictators' valuations of

[2] The inverse hyperbolic sine function is $f(x) = \ln\left(x + \sqrt{1+x^2}\right)$. It is similar to a log transformation that accommodates values of x that are not strictly greater than zero.

[3] In terms of Proposition 5, a statistically significant negative coefficient on λ suggests that the threshold $\widetilde{\beta}$ is strictly greater than zero. Where the coefficient on λ is not statistically distinguishable from zero, we cannot reject that $\widetilde{\beta} = 0$. In this latter case, we cannot reject that the dictator does not regard the common pool of tokens as part of her endowment and hence does not feel losses when transferring these common tokens to the recipient.

[4] Noting that the magnitudes of the coefficient estimates for λ and $\beta \times \lambda$ are smaller (in absolute value) than in the baseline results, one might be tempted to conclude that outliers had some influence on the original estimates. However, the estimates are not easily comparable across columns. For instance, the standard deviation of the untransformed λ is 53.5 while for the top/bottom coded λ it is 12.9. The meaning of a one-unit change in the standardized versions of these variables is therefore somewhat different.

six recipient lotteries. A "recipient lottery," denoted by P^r, yielded 20,000 COP for the recipient with probability P and 0 COP for the recipient with probability $1-P$. Valuations of recipient lotteries are denoted as $Y^j(P^r)$. The superscript j indicates whether recipient lottery valuations are self-peso valuations ($j=s$) or recipient-peso valuations ($j=r$). Self-peso valuations are in Colombian pesos given to dictators, and recipient-peso valuations are in Colombian pesos given to recipients.

$Y^r(P^r)$ is the valuation such that a dictator is indifferent between the recipient receiving $Y^r(P^r)$ COP with certainty and the recipient receiving the outcome of P^r. $Y^r(P^r)$ results from decisions involving *no tradeoff* between payoffs for the dictator and the recipient (no self-recipient tradeoff contexts). Note that $Y^r(P^r)|_{P=1} = 20000$; that is, the riskless lottery that yields a sure 20,000 COP for the recipient is worth 20,000 COP in recipient pesos. $Y^s(P^r)$ is the valuation such that a dictator is indifferent between herself receiving $Y^s(P^r)$ COP with certainty and the recipient receiving the outcome of P^r. $Y^s(P^r)$ results from decisions involving a *tradeoff* between payoffs for the dictator and the recipient (self-recipient tradeoff contexts). Note that, in Task 10 from the main text, we already elicited $Y^s(P^r)|_{P=1}$, i.e., the self-peso valuation of a riskless recipient lottery. Thus, we have that $Y^s(P^r)|_{P=1} = X$, where X is the dictator-specific valuation elicited in Task 10.[5]

Because self-peso valuations and recipient-peso valuations are elicited in different units, we consider valuations scaled as a percentage of the corresponding riskless lottery valuation. Self-peso valuations ($Y^s(P^r)$) are scaled as a percentage of X COP being given to the dictator. Recipient-peso valuations ($Y^r(P^r)$) are scaled as a percentage of 20,000 COP being given to the recipient.

Excuse-driven risk preferences allow for the possibility that the same recipient lottery "may be valued differently depending on whether the context permits excuses not to give" (Exley 2016, p. 592). The following is, according to Exley, the key mechanism behind excuse-driven risk preferences:

> "When [dictators] decide between [recipient] lotteries and self-certain amounts, they may overweight the possibility that recipient lotteries yield [zero-peso recipient] payoffs as an excuse to choose the self-certain amounts over [recipient] lotteries. A resulting increased aversion to [recipient] risk would yield lower [recipient] lottery valuations relative to those in the no self-[recipient] tradeoff context." (Exley 2016, p. 592)

Thus, if dictators have excuse-driven risk preferences for some probability P, then $\frac{Y^r(P^r)}{20000} >$

[5]Recall that the relationship between our proxy for β and X is: $\beta = \frac{X}{20{,}000}$, where X is determined by subtracting 500 to the dictator's switch point in Task 10.

$\frac{Y^s(P^r)}{X}$ (see Prediction 3 from Exley [2016]). We, therefore, take the difference $\frac{Y^r(P^r)}{20000} - \frac{Y^s(P^r)}{X}$ as a measure of excuse-driven risk preferences for probability P.

Participants first completed Task 10, which elicited dictator-specific X values. Participants were unaware that their choices in Task 10 determined the range of self-certain amounts that they later faced. After completing Task 10, participants completed six price lists that provided data on their recipient lottery valuations. In each of the price lists, participants made twenty-one binary decisions between two Options (A and B). In a given price list, Option A was constant across all rows, and always involved a recipient lottery. Recall that a recipient lottery yielded 20,000 COP for the recipient with probability P and 0 COP otherwise. On the other hand, Option B always involved either a self-certain amount or a recipient-certain amount that increased as a participant proceeded down the rows of the list. Self-certain amounts yielded 0 COP, $\frac{X}{20}$ COP, ..., or X COP to the dictator with certainty, while recipient-certain amounts yielded 0 COP, 1,000 COP, ..., or 20,000 COP to the recipient with certainty.

There were two blocks of tasks: {recipient lottery} X {self-certain amount, recipient-certain amount}. Each block had three price lists. Price lists within a block only differed according to the probability P involved in the lottery, where $P \in \{0.4, 0.6, 0.8\}$. Participants first completed all price lists in one block, and then completed all price lists in the remaining block. Blocks were presented in a randomly determined order across study sessions.[6]

From participants' decisions in a valuation price list, we estimated their corresponding lottery valuations ($Y^r(P^r)$ and $Y^s(P^r)$) as follows. Suppose a participant switched from choosing a lottery in Option A to some certain amount B_i on the i^{th} row. Because the certain amount in Option B always increased as participants proceeded down the rows of the list, their valuations fall between B_{i-1} and B_i. We estimate their valuations as the midpoint, i.e., $\frac{B_{i-1}+B_i}{2}$. As in Task 10, we assume that the first switch point of a multiple switcher is her true switch point. We report results both for the restricted sample of dictators (with a single switch point in each of Tasks 10, 18, and 19) and for an extra-restricted sample: a subset of our restricted sample with at most one switch point in each of the valuation tasks (Tasks 11-16).

B.2.2 Features of excuse-driven risk preferences in our data

Appendix Table A4 shows the prevalence of excuse-driven risk preferences in our restricted sample of dictators. (Results for the extra-restricted sample are similar and are not shown.)

[6]Because participants' choices in Task 10 determined the range of self-certain amounts that they later faced, we implemented the price lists with self-certain amounts (including Task 10) using the computer; these tasks were programmed using the software z-Tree (Fischbacher 2007).

The first three columns report the mean excuse value of risk (the difference $\frac{Y^r(P^r)}{20000} - \frac{Y^s(P^r)}{X}$) for the probabilities $P \in \{0.4, 0.6, 0.8\}$. The fourth column reports the "mean excuse" value, which is the average of the three excuse values. The evidence in Table A4 suggests that excuse-driven preferences are not widespread in our data. The use of risk as an excuse only appears to be important (positive and significantly different from zero) at $P = 0.8$. For lower probabilities, the mean excuse value is either zero ($P = 0.6$) or even significantly negative ($P = 0.4$). Averaged across all probabilities, the mean excuse value of risk (column (4)) is zero.[7]

Appendix Table A5 provides a descriptive analysis of the correlates of the tradeoff and no-tradeoff valuations and the excuse value of risk. The results are for the restricted sample, and each dictator from the restricted sample contributes three observations (one for each of the winning probabilities .4, .6, and .8). As expected, both types of valuations increase with our proxy for β, and more inequality-averse dictators (higher β) are less likely to use risk as an excuse not to give. No-tradeoff valuations increase with winning probability (column (2)), although (surprisingly) tradeoff valuations do not (column (4)). The use of risk as an excuse increases significantly with the winning probability of the recipient's lottery. The results show no evidence of order effects, and differences between experimental conditions are small (no-tradeoff valuations are marginally higher in POSITIVE ENDOWMENT, but trade-off valuations and the use of risk as an excuse do not vary across conditions).

B.2.3 Robustness of Proposition 5 test results to accounting for excuse-driven risk preferences

Consider how excuse-driven risk preferences might affect giving in our dictator games with risky outcomes. For any combination of p and ϕ, there is a *maximum* winning probability, which results from the dictator giving all tokens to the recipient. By construction, when the maximum winning probability is strictly smaller than one, there is *irreducible* recipient risk. The dictator might use the fact that she cannot eliminate risk as an excuse to give less. For instance, the dictator might reason: "Even if I gave all of the tokens to the recipient, there is still a chance that she fails to win the lottery. I do not feel like giving much because my contribution could go to waste." Note, however, that if the maximum winning probability were equal to one (as when $p = 40$ and $\phi = 3$), the context would not permit an excuse, since the dictator would be able to eliminate recipient risk. We chose the set of probabilities $\{0.4, 0.6, 0.8\}$ for the valuation tasks to make the measure of excuse-driven

[7] Our measures of excuse-driven preferences are highly correlated within dictators. The partial Spearman correlations (taken after "partialling" out the effects of our demographic control variables) are: *corr*(Excuse 40, Excuse 60) = 0.822; *corr*(Excuse 40, Excuse 80) = 0.567; and *corr*(Excuse 60, Excuse 80) = 0.726. All correlations are significantly different from zero (p-values < 0.001).

preferences relevant to our dictator games. Such set of probabilities is the set of maximum winning probabilities from our dictator games that are strictly smaller than one.[8] (The only maximum winning probability that is missing is 0.2, which occurs when $p = 0$ and $\phi = 1$. We decided not to include it to keep the number of additional tasks down.)

Appendix Table A6 shows the robustness of our Proposition 5 test results to accounting for the use of risk as an excuse. Column (1) replicates our main results for the restricted sample of dictators. Columns (2) and (3) add the measures of excuse-driven preferences described above. In column (2), we add the average excuse value, and in column (3), we add the three individual excuse-value measures (one for each of the winning probabilities). In both cases, the addition of these controls has almost no effect on our results, and the excuse-driven preference variables themselves are all insignificant. Columns (4)-(6) repeat this exercise for the extra-restricted subset of dictators who have a single switch point in all six of the tradeoff and no-tradeoff valuation tasks. By imposing this additional restriction on the sample, we discard one-third of our sample and are left somewhat under-powered. The lack of power is evident from column (4), which replicates our main results (as in column (1)) for this smaller sample without additional controls. Apart from the coefficient on β, none of the other estimates is significant. The estimates themselves are not appreciably changed. Adding the excuse-value controls in columns (5) and (6) has little effect on our estimates: the signs are unchanged, the magnitudes change little, and all remain imprecisely estimated.

Interestingly, to the extent that excuse-driven risk preferences matter at all, they appear to exert a *positive* effect on participation in the dictator games. The coefficients on mean excuse value and the excuse value at winning probability $P = .4$ are both positive and statistically significant. Contrary to our expectations, the results indicate that dictators who are more prone to using risk as an excuse not to give are actually *more* likely to give a non-zero amount of tokens in the dictator games.

While it is curious that these measures from Exley (2016) do not have the anticipated effect in our setting, the important conclusion for our purposes is that our main Proposition 5 test results were not driven by omitted variable bias from a failure to account for excuse-driven risk preferences.[9]

[8] The maximum winning probability is 0.4 when $p = 0$ and $\phi = 2$, or $p = 20$ and $\phi = 1$. Similarly, the maximum winning probability is 0.6 when $p = 0$ and $\phi = 3$, or $p = 20$ and $\phi = 2$, or $p = 40$ and $\phi = 1$. Finally, the maximum winning probability is 0.8 when $p = 20$ and $\phi = 3$, or $p = 40$ and $\phi = 2$.

[9] Without a formal model underlying excuse-driven risk preferences, we can only speculate about why the measures from Exley (2016) do not perform as expected in our setting. One possibility is that our dictator games differ significantly from the tasks used to elicit excuse values. In our dictator games, (i) the recipient plays the lottery regardless of the dictator's choice; (ii) the dictator's actions influence the recipient's probability of success; and (iii) by making a contribution to the recipient, the dictator does not necessarily forgo her entire payoff from the task. By contrast, in the excuse value tasks, (i) the dictator's actions determine whether the recipient plays the lottery or not; (ii) the dictator cannot affect the probability

B.3 Using an alternative measure of β

In this appendix, we test Proposition 5 using an alternative measure of β. To elicit such a measure, we used Task 17, which we adapted from Blanco, Engelmann, and Normann (2011). We denote the alternative measure of β obtained from Task 17 by β_{BEN} (where the acronym BEN stands for Blanco, Engelmann, and Norman).

In Task 17, the dictator faced a price list with twenty-one decision rows. Each decision row was a choice between two Options (A and B). Option A was an equal distribution of payoffs between the dictator and the recipient. Such distribution varied across rows from (30,000 COP, 30,000 COP) to (20,000 COP, 20,000 COP), in steps of 500 COP. Option B, which was fixed across rows, offered 30,000 COP to the dictator and 20,000 COP to the recipient. Thus, by choosing Option B in a given row, the dictator could increase her own payoff to 30,000 COP at the expense of the recipient's payoff. (Note the last decision row is the only row in which the dictator could increase her payoff by choosing Option B without hurting the recipient's payoff.) A dictator's choices in Task 17 indicate how much money, between 0 COP and 10,000 COP, she is at most willing to sacrifice in order to achieve an equal distribution of payoffs.

From participants' decisions in Task 17, we estimate the degree of guilt aversion, β_{BEN}, as follows. The i^{th} row of the price list is a choice between the Option A distribution $(20000+a_i, 20000+a_i)$ and the Option B distribution $(30000, 20000)$, where $a_i \in \{0, 500, ..., 10000\}$. Using (7) from the main text, the dictator's utilities of the choice options are

$$\begin{aligned} W(20000+a_i, 20000+a_i) &= 20000 + a_i - \beta\ [20000 + a_i - (20000 + a_i)]^\gamma \\ &= 20000 + a_i \\ W(30000, 20000) &= 30000 - \beta\ [30000 - 20000]^\gamma \\ &= 30000 - \beta\ 10000^\gamma. \end{aligned}$$

The amount of (additional) money a^* that makes the dictator indifferent between $(20000+a_i, 20000+a_i)$ and $(30000, 20000)$ satisfies $W(20000+a^*, 20000+a^*) = W(30000, 20000)$. From this indifference condition, we obtain $\beta_{BEN} = \frac{10000-a^*}{10000^\gamma}$. Note that $\beta_{BEN} = (\beta_{BEN}|_{\gamma=1}) \cdot \left(\frac{1}{10000^{\gamma-1}}\right)$, where $\beta_{BEN}|_{\gamma=1} = \frac{10000-a^*}{10000}$. Thus, under the assumption that the value of γ is the same across dictators, β_{BEN} is a monotone transformation of $\beta_{BEN}|_{\gamma=1}$. For simplicity, we take $\beta_{BEN}|_{\gamma=1}$ as the measure of β obtained from Task 17.[10]

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of success; and (iii) if she allows the recipient to play the lottery, the dictator receives no payoff from the task.

[10] The arrangement of the two options in the price list differs from that of Blanco, Engelmann, and Normann (2011). In their list, Option A is the (fixed) unequal distribution, whereas Option B features a series of equal

Appendix Table A7 shows how the results of the test of Proposition 5 change when we replace our proxy for β with β_{BEN} in the regressions. We report the results for the restricted sample of dictators using our preferred measure of λ. The first three columns replicate the results with our proxy for β, which we already presented in Table 6 from the main text. The last three columns display the results with β_{BEN}. Similar to our proxy for β, β_{BEN} is positively correlated with participation in the dictator games with risky outcomes; this correlation is statistically significant in all specifications. By contrast, while the relationship between loss aversion and giving has the predicted sign, it is no longer statistically significant.[11]

This finding is not surprising in light of the fact that the Spearman correlation between our proxy for β and β_{BEN} is 0.51 (p-value < 0.001). (This is the rank correlation after partialling out demographics.) On the one hand, because the two measures were elicited from different tasks, a positive rank correlation suggests that there exists a domain-general component of guilt aversion. On the other hand, the fact that the rank correlation is quite far from perfect suggests that, due to the specifics of the tasks, some individuals' relative ranking of guilt aversion changes across tasks. One noticeable difference between the two tasks concerns the structure of payoffs to the recipient. While in Task 10 the recipient gets either 0 COP or $20,000$ COP—depending on the dictator's choice, in Task 17 the recipient gets some amount between $20,000$ COP and $30,000$ COP. As a result of this structure of payoffs, Task 10 appears to be more similar to the dictator games with risky outcomes than Task 17. For this reason, it seems reasonable that our proxy for β, elicited from Task 10, better captures a dictator's concern for equality in the dictator games with risky outcomes.

The above exercise relates to a literature in economics and psychology that investigates the relative generality of preferences and personality measures across different contexts. Within this literature, the stability of risk preferences across domains has received particular attention; see Einav et al. (2012) and the references therein. Blanco, Engelmann, and Normann (2011) examined the individual consistency of other-regarding preferences across strategically different games, such as the modified dictator game we adapted in Task 17, the

distributions. We decided to place the series of equal distributions on the left-hand side for two reasons. First, if the dictator evaluates payoffs relative to a reference point, putting the fixed unequal allocation on the left-hand side might have induced this allocation as the reference point (following Sprenger's [2015] "first-focus" intuition); in this case, the dictator would experience individual losses by choosing an equal allocation on the right-hand side (except if payoffs are 30,000 COP for each participant), which would obscure the identification of β_{BEN}. Second, the chosen arrangement of the two options makes Task 17 more similar to Task 10, in which Option A also represents an equal distribution of payoffs ($20,000$ COP for each player). In spite of our attempt to make Task 17 similar to Task 10, there are some differences between the two tasks that might weaken the association between our proxy for β and β_{BEN}. We discuss these differences below.

[11] The results using β_{BEN} improve somewhat in specifications that use transformations of λ. See Appendix Table A8.

ultimatum game, a public-goods game, and a sequential-move prisoner's dilemma. Research in social psychology has examined the consistency of measures of personality obtained from behavior across different situations. (See, for example, the pioneering work by Mischel [1968]; Ross and Nisbett [1991] provide a general discussion and several other references).

Most research looking at the consistency of behavior across contexts has rejected the null hypothesis that there is no domain-general component to preferences or personality. The findings, however, show that behavior in a given situation is sometimes a poor predictor of behavior in related but different situations. The specifics of each situation could lead the same individual to behave quite differently across situations (Mischel 1968; Blanco, Engelmann, and Normann 2011). This pattern found in the literature seems to apply to our study with regard to the associations between our proxy for β, β_{BEN}, and giving under risk. As we discussed, if we compare the situations in which our proxy for β and β_{BEN} were elicited, the former situation resembles the situation of the dictator games with risky outcomes more closely. This appears to have resulted in a stronger association between our proxy for β and giving in the dictator games.

C Recipients' expectations

In this appendix, we discuss the recipients' ex-ante beliefs about the dictators' actions. In Tasks 1-9, recipients were asked how many tokens they expected their dictator partner would allocate to them in each task. In Tasks 10 and 17 and the no-tradeoff lottery valuation tasks, recipients were asked which of the two options (A or B) they expected their dictator partner would choose on each row of the price lists used for those tasks. Recipients' tasks were not incentivized monetarily.

In the following two sub-sections, we use the data on the recipients' expectations in two ways. First, we assess how well the recipients' ex-ante beliefs align with the actual actions taken by the dictators. Second, we re-test Propositions 1-4 using the recipients' expectations instead of the dictators' choices.

C.1 Recipients' expectations versus dictators' choices

In Appendix Table A9, we use regression analyses to compare recipients' expectations and dictators' actions. For these regressions, we pool the data across tasks. In columns (1) and (2), we present the results from a Tobit model in which the dependent variable is x_{ij}, the number of tokens given or expected by individual i in task j. In columns (3) and (4) are estimates from a linear probability model with dependent variable equal to one if the dictator gives or the recipient expects a non-zero number of tokens, and equal to zero otherwise. The last two columns contain estimates from a least squares regression of the number of tokens given or expected conditional on giving or expecting a positive amount. Within each pair of columns, the first (odd columns) regresses the dependent variable on a single regressor: a dummy that equals one if individual i is a dictator and equals zero otherwise. The second column in each pair (even columns) adds further demographic control variables. While some differences between dictators and recipients exist in the regressions without controls, these differences are no longer statistically significant after controlling for demographic characteristics.

For completeness, we also calculated our measures of β, β_{BEN}, and the no-tradeoff lottery valuations using recipients' expectations and compared these results with our measurements using the dictators' actions. In least squares regressions that control for demographic characteristics, we find no statistically meaningful differences in any of these variables between dictators and recipients.

C.2 Testing Propositions 1-4 with recipients' expectations

We turn now to replicating our tests of Propositions 1-4 with our data on recipients' expectations. Because we did not collect data on loss aversion for recipients, we cannot conduct this replication exercise for Proposition 5.

Appendix Table A10 shows our results for Propositions 1-3. (This table re-creates Appendix Table 4 with the recipient data.) The results again appear to validate Proposition 1, which states that participation is increasing in ϕ. Specifically, dictator participation expected by recipients is greater when $\phi = 2$ or $\phi = 3$ than when $\phi = 1$, although we cannot reject that the coefficients on $\phi = 2$ and $\phi = 3$ are equal. With respect to Proposition 3, again, we find that p has no effect on the extensive margin of giving, which is consistent with the predictions of Proposition 3 for reference points other than $R^{rec}_{\hat{x}}$. On the intensive margin, the coefficient estimates are either significantly negative or not different from zero. On the one hand, the zeros are consistent with the intensive margin predictions of Propositions 2 and 3, which predict a weakly positive relationship between ϕ and p and the amount of tokens given in a fully linear model. On the other hand, the significant negative estimates reject Propositions 2 and 3.

In Appendix Table A11, we test Proposition 4 with the recipients' data. As in our analysis of dictators' choices, we find that the experimental condition has no effect on expected giving behavior on either the extensive or intensive margins. This rejects Proposition 4, which predicts that recipients will expect a higher amount of tokens in POSITIVE ENDOWMENT than they will in ZERO ENDOWMENT.

Overall, we conclude that the evidence from the recipients' data generally supports Proposition 1, is mixed (but leaning toward rejection) for Propositions 2 and 3, and rejects Proposition 4. These results are in line with our results for the sample of dictators (except that the dictator results showed a clearer rejection of Propositions 2 and 3).

D Alternative models of giving

In addition to the social preferences models discussed in the main text, in this appendix we consider a different class of models in which dictators give not because of their concern for the welfare of the recipients but in order to meet certain giving "targets." We explore two basic types of models: first, models in which the dictator targets a particular amount of tokens; and second, models in which a dictator targets a particular winning probability for the recipient. We first summarize the models and their predictions, and then we test the predictions against the data.

Amount targeting models Suppose that a dictator would like to give—or believes that she *ought* to give—a certain target amount of tokens, a. The target amount could arise if a dictator reasons that, in order to avoid appearing selfish either to herself or others, she must give at least some minimum amount of tokens (see, e.g., Dana, Weber, and Kuang [2007]). Alternatively, a dictator may wish to give the recipient the number of tokens that she believes the recipient expects her to give (see, e.g., Dana, Cain, and Dawes [2006], p. 200). Still another possibility is that the dictator perceives the mere act of giving something as virtuous, and hence receives a "warm glow" by giving a minimum amount of tokens (Andreoni 1990). In a simple version of the model in which a dictator cares only about minimizing the distance between the number of tokens given and the target, her utility is given by:

$$U(x) = -(a-x)^{\gamma},$$

where $\gamma \geq 1$. A dictator operating under this model should give the same number of tokens x^* in every task. Neither p nor ϕ should affect the dictator's participation nor the amount given. By contrast, the recipient's implied winning probability, $q^* = p + \phi x^*$, will be increasing in p and (when $a > 0$) ϕ. Note that a hybrid between this model and a pure selfishness model would yield the same predictions.

Probability targeting models Consider a dictator who, rather than targeting an amount of tokens, instead targets a winning probability, q, for the recipient. Such a model could arise if a dictator wishes to ensure that the recipient has at least a certain minimum chance of winning the prize. In our setting, this type of model is equivalent to one in which the dictator targets a particular ex-ante payoff for the recipient. In a simple version of the problem in which the dictator cares only about reaching the target, her utility is given by:

$$U(x) = -\left(q - (p + \phi x)\right)^{\gamma},$$

where $\gamma \geq 1$. The model predicts that whenever a dictator's optimal choice of tokens x^* is strictly in the interior of her budget set (i.e., $x^* \in (0, 20)$ in our setting), we know that she is (at least approximately) hitting her target: $q^* = p + \phi x^* \approx q$. As a result, in response to an increase in p or ϕ, the dictator will need to reduce the number of tokens given in order to maintain her target. Hence, at an interior solution, x^* should be decreasing in p and ϕ while q^* should be constant. Finally, it is also possible to show that participation depends only on p and that an individual will participate only if $p < q$. Hence, the model predicts that participation is weakly decreasing in p.

Hybrids of probability targeting and selfishness Consider an extension of the probability targeting models in which a dictator cares also about her own payoff. Given the target probability, q, the dictator's utility is given by:

$$U(x) = (\overline{x} - x) - \alpha\left(q - (p + \phi x)\right)^{\gamma},$$

where $\gamma \geq 1$ and $\overline{x}$ is the total number of tokens available. At an interior solution, we have the following testable implications: $\frac{\partial q^*}{\partial p} = 0$, $\frac{\partial q^*}{\partial \phi} \geq 0$, and $\frac{\partial x^*}{\partial p} < 0$. In addition, participation now depends on both ϕ and p. As p increases, participation weakly decreases. If $\gamma > 1$, participation is weakly increasing in ϕ.

Summary of model predictions Table A12 summarizes the predictions of the three types of alternative models. It is worth noting how far many of these predictions depart from the predictions we obtained for a broad class of social preferences models in the main text. For example, Proposition 1 predicts that participation will be (weakly) increasing in ϕ. This prediction is not shared by either of the pure targeting models, and it holds only for $\gamma > 1$ in the hybrid probability targeting model with selfishness. The linear version of the social preferences model is also at odds with the targeting models. Propositions 2 and 3 state that the amount of tokens given should be (weakly) increasing in both ϕ and p. By contrast, in the amount targeting model, the number of tokens given should not vary with ϕ and p, and in the probability targeting model, the number of tokens given should be *decreasing* in both parameters. The hybrid model also predicts that the number of tokens given will be decreasing in p though the effect of ϕ is unclear. Finally, the models discussed in this section predict that neither the recipient's nor dictator's endowments nor the degree of the dictator's loss aversion should matter for giving behavior. Hence, neither of Propositions 4 and 5 hold for the targeting models.

[Table A12 about here]

Results We turn first to the simplest and most intuitive tests of the pure targeting models. These results appear in Table A13. First, in a model in which a dictator cares only about giving a certain target amount, she should give the same amount in each task. We observe this behavior in only 3 out of 110 dictators: of these, 2 behave perfectly selfishly and 1 gives 10 tokens (half of the pool) in each task. Clearly, a pure amount targeting model does a poor job of explaining dictator behavior among our subjects.

Second, in a model in which a dictator cares only about reaching a target winning probability for the recipient, implied winning probabilities, q^*, should be roughly constant for each dictator across tasks in which she gives strictly interior ($x^* \in (0, 20)$) numbers of tokens.[12] This prediction is not borne out in Table A13. Only 4 dictators choose to give their recipient a constant winning probability. Even under a more flexible standard in which we allow the implied winning probabilities to vary by up to 10 percentage points, the number of dictators whose behavior is consistent with a pure targeting model rises only slightly, to 8 dictators. We conclude that a pure probability targeting model is, at best, capable of explaining the behavior of only a few of our dictators.

[Table A13 about here]

Turning back now to Table A12, we compare the predictions of the models that we derived above to the patterns in the data. Predictions in blue are supported by the data; those in red are rejected. The results in the "Data" column for participation and the number of tokens given, x^*, are a summary of the results reported in Table 4. The results for q^* are from Table A14.

[Table A14 about here]

[12] The reason is that a dictator only gives strictly interior amounts when the target is attainable (and $q > p$); otherwise, she is at a boundary. Hence, a dictator giving an interior amount should be hitting her target, which does not vary across tasks.

Looking at Table A12, we see that each of the three types of models makes at least one prediction that is rejected by the data. Both pure targeting models perform especially poorly, which is consistent with the patterns documented in Table A13 and discussed just above. These models are strongly rejected despite the fact that our experimental design is particularly amenable to this sort of decision-making.[13]

On the other hand, apart from one prediction, a hybrid model in which utility is a concave function of the distance from the target probability (i.e., $\gamma > 1$) does a decent job of fitting the data. Conditional on giving a non-zero amount, this model predicts, consistent with the data, that the number of tokens given decreases as both p and ϕ increase. In the data, however, although the amount given decreases, the implied winning probabilities of the recipients are increasing in both ϕ and p. While a hybrid model can match the former pattern, it cannot match the latter.

Finally, not shown in Table A12, none of the targeting models is capable of explaining the relationship that we observe between participation and loss aversion (Proposition 5).[14] This represents an important limitation of these models relative to the class of social preferences models with reference dependence that we examined in the main text.

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[13] In each row of the decision tables associated with the dictator tasks, a dictator can easily read off both the number of tokens and the implied winning probability of the recipient, making it relatively simple to target either of these quantities.

[14] Simple extensions of the targeting models that allow the dictator to care about her own payoff and evaluate it relative to a reference point do not improve matters. In fact, the adjusted models would predict a negative correlation between tokens given and loss aversion, inconsistent with the data.

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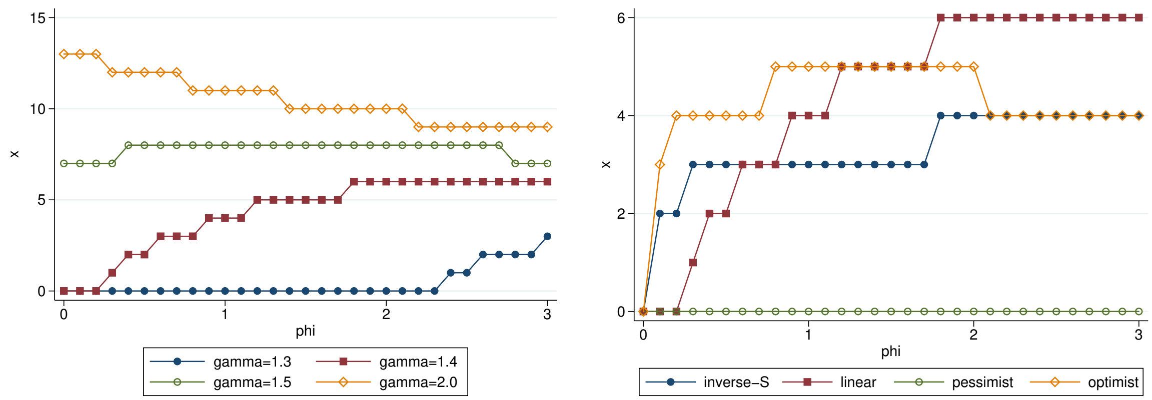
Figure A1: Illustration of the effects of γ and π on the relationship between x^* and ϕ.



A. Effect of γ

B. Effect of π.

Notes: In both panels, the recipient's reference point is $R^{rec}_{\widehat{P}}$ with $\widehat{P} = 0$ (she evaluates gains and losses relative to her initial wealth), and the dictator's reference point is R^{dic}_{end} (she treats her endowment plus the common pool of tokens as her reference point). In both panels, the baseline winning probability $\frac{p}{100}$ is zero. In Panel A, there is no subjective probability weighting, but γ is allowed to vary. In Panel B, we fix $\gamma = 1.4$, but we allow $\pi(\cdot)$ to vary. We parameterize $\pi(\cdot)$ using the two-parameter functional form proposed by Prelec (1998): $\pi(q) = \exp(-\xi(-\ln(q))^\rho)$. The dictator with no subjective probability weighting corresponds to $(\rho, \xi) = (1, 1)$; the dictator with an inverse-S-shaped function (who overweighs small probabilities and underweighs large probabilities) corresponds to $(\rho, \xi) = (0.5, 1.1)$; the "pessimist" (who systematically underweighs probabilities) corresponds to $(\rho, \xi) = (1, 2)$; and the "optimist" (who systematically overweighs probabilities) corresponds to $(\rho, \xi) = (1, 0.5)$. Note that in Panel A a dictator whose value of *gamma* is 1.5 or 2 gives a positive amount of tokens even if $\phi = 0$. This is puzzling because when $\phi = 0$, giving does not raise the recipient's winning probability at all; hence, the dictator is throwing away part of her money to reduce inequality. This kind of behavior does exist in practice, although it is quite rare (see, e.g., Bolton and Ockenfels [2006] and the discussion by Engelmann and Strobel [2006]). If the dictator cares enough about efficiency, then she will not give any tokens when $\phi = 0$.

Table A1: Balance test among dictators by condition.

	(1) All *(N=110)*	(2) ZERO *(N=55)*	(3) POSITIVE *(N=55)*	(4) Test of equality of proportions	(5) Wilcoxon rank-sum test
Female	0.591	0.600	0.582	0.846	
Economics/Finance Major	0.527	0.418	0.636	0.022	
Previous Lab Experience	0.400	0.364	0.436	0.436	
Bogotá	0.818	0.836	0.800	0.621	
Age	20.655	20.764	20.545		0.896
Semester	5.891	5.909	5.873		0.863
Stratum	3.600	3.509	3.691		0.371
β	0.325	0.341	0.310		0.878
$\widetilde{\lambda}$	6.453	7.512	5.395		0.272
λ	15.248	12.015	18.481		0.853
$\pi(0.5)$	0.501	0.489	0.514		0.966

Notes: Balance test to assess random assignment of dictators to the ZERO and POSITIVE ENDOWMENT experimental conditions. Columns (1), (2), and (3) display the means of several explanatory variables for the full sample of 110 dictators and the two 55 dictator sub-samples assigned to the ZERO and POSITIVE conditions, respectively. Column (4) reports p-values from chi-squared tests of equality of proportions for the four binary variables in the table. Column (5) reports p-values from Wilcoxon rank-sum tests for the remaining variables. In each case, the null hypothesis is that the variables are drawn from the same underlying distribution for all dictators, regardless of experimental condition assignment.

Table A2: Robustness of Proposition 5 test results. Using preferred measure of λ. Restricted dictators.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Participation: Restricted Dictators									
	Baseline	Baseline	T/B code	T/B code	IHS	IHS	Rank	Rank	High/Low	High/Low
β	0.468***	0.452***	0.378***	0.429***	0.351***	0.405***	0.362***	0.428***	0.101	0.119
	(0.114)	(0.107)	(0.114)	(0.106)	(0.106)	(0.100)	(0.113)	(0.110)	(0.123)	(0.127)
λ	-0.455***	-0.369***	-0.144***	-0.125***	-0.162**	-0.110	-0.100*	-0.053	-0.228**	-0.158
	(0.121)	(0.098)	(0.054)	(0.047)	(0.081)	(0.078)	(0.057)	(0.059)	(0.099)	(0.106)
$\beta \times \lambda$	0.894***	0.824***	0.272**	0.393***	0.311**	0.357**	0.201*	0.240**	0.541***	0.538**
	(0.236)	(0.194)	(0.119)	(0.121)	(0.155)	(0.141)	(0.110)	(0.100)	(0.204)	(0.215)
$\pi(0.5)$		-0.087**		-0.094***		-0.102***		-0.095**		-0.078**
		(0.033)		(0.035)		(0.035)		(0.038)		(0.035)
N	702	702	702	702	702	702	702	702	702	702
R^2	0.154	0.177	0.146	0.169	0.136	0.163	0.131	0.156	0.139	0.162

Notes: * p<.1, ** p<.05, *** p<.01. Standard errors are clustered by dictator and shown in parentheses. In all specifications, the dependent variable equals one if dictator i gives more than zero tokens in Task j and equals zero otherwise, where $j = 1, 2, ..., 9$. An observation is at the dictator-task level. The estimation sample is our restricted sub-sample of 78 dictators with a single switch point in each of Tasks 10, 18, and 19. The key explanatory variables are β, our preferred measure of guilt aversion; λ, our preferred measure of loss aversion; their interaction; and $\pi(0.5)$, a measure of subjective probability weighting at the probability one-half. λ and $\pi(0.5)$ are standardized by subtracting their means and dividing by their standard deviations (z-scores). The first two columns, labeled "Baseline," repeat the original results from Columns (5) and (6) of Table 6. For a complete listing of the other explanatory variables, see the notes for Table 6. The remaining columns estimate variants of the same model under various transformations of λ. Columns (3) and (4), labeled "T/B Code," show the results when we top/bottom code λ at its 95th/5th percentiles before standardizing. Columns (5) and (6), labeled "IHS," take the inverse hyperbolic sine of λ before standardizing. The inverse hyperbolic sine function is $f(x) = \ln\left(x + \sqrt{1 + x^2}\right)$. It is similar to a log transformation that accommodates values of x that are not strictly greater than zero. Columns (7) and (8), labeled "Rank," discard the cardinal information contained in λ and rank each dictator in ascending order of λ (1 is the smallest). The regressor is the standardization of the rank. Columns (9) and (10), labeled "High/Low," classify dictators into two groups: those with λ above the median and those with λ below (or equal to) the median. The regressor is an indicator that equals one if the dictator is in the "high" category.

Table A3: Robustness of Proposition 5 test results. Using preferred measure of λ. Full sample of dictators.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Participation: Full Sample of Dictators									
	Baseline	Baseline	T/B code	T/B code	IHS	IHS	Rank	Rank	High/Low	High/Low
β	0.318***	0.336***	0.323***	0.380***	0.356***	0.393***	0.351***	0.392***	0.112	0.144
	(0.087)	(0.083)	(0.089)	(0.086)	(0.085)	(0.083)	(0.091)	(0.090)	(0.092)	(0.091)
λ	-0.090	-0.043	-0.089*	-0.068	-0.117**	-0.059	-0.091**	-0.052	-0.193**	-0.129
	(0.088)	(0.077)	(0.047)	(0.047)	(0.049)	(0.053)	(0.042)	(0.047)	(0.082)	(0.088)
$\beta \times \lambda$	0.220	0.213	0.181*	0.265**	0.274**	0.269***	0.190**	0.198**	0.485***	0.464***
	(0.174)	(0.153)	(0.105)	(0.104)	(0.111)	(0.101)	(0.088)	(0.082)	(0.168)	(0.172)
$\pi(0.5)$		-0.080***		-0.070***		-0.076***		-0.061**		-0.059***
		(0.022)		(0.022)		(0.026)		(0.025)		(0.022)
N	989	989	989	989	989	989	989	989	989	989
R^2	0.095	0.124	0.104	0.124	0.109	0.129	0.108	0.123	0.111	0.129

Notes: * p<.1, ** p<.05, *** p<.01. Standard errors are clustered by dictator and shown in parentheses. In all specifications, the dependent variable equals one if dictator i gives more than zero tokens in Task j and equals zero otherwise, where $j = 1, 2, ..., 9$. An observation is at the dictator-task level. The estimation sample is our full sample of 110 dictators. The key explanatory variables are β, our preferred measure of guilt aversion; λ, our preferred measure of loss aversion; their interaction; and $\pi(0.5)$, a measure of subjective probability weighting at the probability one-half. λ and $\pi(0.5)$ are standardized by subtracting their means and dividing by their standard deviations (z-scores). The first two columns, labeled "Baseline," repeat the original results from Columns (2) and (3) of Table 6. For a complete listing of the other explanatory variables, see the notes for Table 6. The remaining columns estimate variants of the same model under various transformations of λ. Columns (3) and (4), labeled "T/B Code," show the results when we top/bottom code λ at its 95th/5th percentiles before standardizing. Columns (5) and (6), labeled "IHS," take the inverse hyperbolic sine of λ before standardizing. The inverse hyperbolic sine function is $f(x) = \ln\left(x + \sqrt{1 + x^2}\right)$. It is similar to a log transformation that accommodates values of x that are not strictly greater than zero. Columns (7) and (8), labeled "Rank," discard the cardinal information contained in λ and rank each dictator in ascending order of λ (1 is the smallest). The regressor is the standardization of the rank. Columns (9) and (10), labeled "High/Low," classify dictators into two groups: those with λ above the median and those with λ below (or equal to) the median. The regressor is an indicator that equals one if the dictator is in the "high" category.

Table A4: Mean excuse values from Exley tasks.

	(1) Excuse .4	(2) Excuse .6	(3) Excuse .8	(4) Mean Excuse
Mean	-0.098**	0.008	0.209***	0.040
	(0.046)	(0.045)	(0.044)	(0.040)
N	78	78	78	78

Notes: The first three columns report the mean excuse value of risk among the 78 dictators in the restricted sample for each of the probabilities $P \in \{0.4, 0.6, 0.8\}$. Given a recipient lottery with winning probability P in Tasks 11-16, we first calculated each dictator's excuse value of risk (using the measure of excuse-driven risk preferences based on Exley [2016]) and then computed the average value across dictators. The average excuse value of risk for probability P is shown in the column labeled "Excuse 'P'." The fourth column reports the "mean excuse" value, which is the average of the three excuse values. Results are qualitatively unchanged when we restrict the sample to the 52 dictators with at most one switch point in each of Tasks 11-16.

Table A5: Descriptive analysis of measures from Exley tasks.

	(1) Scaled Valuation No-tradeoff	(2) Scaled Valuation No-tradeoff	(3) Scaled Valuation Tradeoff	(4) Scaled Valuation Tradeoff	(5) Excuse Value	(6) Excuse Value
β	0.247**	0.247**	0.585***	0.585***	-0.338***	-0.338***
	(0.0941)	(0.0945)	(0.106)	(0.107)	(0.124)	(0.125)
$P = .6$		0.0933***		-0.0131		0.106***
		(0.0230)		(0.0146)		(0.0253)
$P = .8$		0.240***		-0.0670**		0.307***
		(0.0305)		(0.0330)		(0.0455)
POSITIVE condition	0.0944*	0.0944*	0.0885	0.0885	0.00592	0.00592
	(0.0499)	(0.0501)	(0.0598)	(0.0601)	(0.0741)	(0.0744)
Trade-off First (Order)	-0.00485	-0.00485	-0.0317	-0.0317	0.0268	0.0268
	(0.0500)	(0.0503)	(0.0596)	(0.0599)	(0.0789)	(0.0793)
Female	-0.0521	-0.0521	0.112*	0.112*	-0.164*	-0.164*
	(0.0567)	(0.0570)	(0.0614)	(0.0617)	(0.0860)	(0.0864)
Age	0.0125**	0.0125**	0.00312	0.00312	0.00934	0.00934
	(0.00529)	(0.00531)	(0.0113)	(0.0114)	(0.0114)	(0.0114)
Semester	0.00901	0.00901	0.00476	0.00476	0.00424	0.00424
	(0.00904)	(0.00908)	(0.0119)	(0.0120)	(0.0131)	(0.0131)
Economics/Finance Major	-0.00727	-0.00727	-0.0101	-0.0101	0.00287	0.00287
	(0.0582)	(0.0585)	(0.0581)	(0.0583)	(0.0734)	(0.0738)
Previous Lab Experience	-0.00720	-0.00720	0.0147	0.0147	-0.0219	-0.0219
	(0.0482)	(0.0484)	(0.0648)	(0.0650)	(0.0815)	(0.0819)
Bogotá	-0.0333	-0.0333	0.0551	0.0551	-0.0883	-0.0883
	(0.0696)	(0.0699)	(0.0676)	(0.0679)	(0.0956)	(0.0960)
Stratum	-0.0155	-0.0155	-0.0319	-0.0319	0.0164	0.0164
	(0.0269)	(0.0271)	(0.0374)	(0.0376)	(0.0370)	(0.0372)
Constant	0.202	0.0912	0.158	0.185	0.0445	-0.0933
	(0.231)	(0.228)	(0.269)	(0.269)	(0.325)	(0.325)
N	234	234	234	234	234	234
R^2	0.119	0.256	0.288	0.295	0.129	0.224

Notes: * p<.1, ** p<.05, ** p<.01. Standard errors are clustered by dictator and shown in parentheses. The dependent variables are: scaled recipient-peso valuations of recipient lotteries (i.e., $\frac{Y^r(P^r)}{20000}$) (columns (1) and (2)); scaled self-peso valuations of recipient lotteries (i.e., $\frac{Y^s(P^r)}{X}$) (columns (3) and (4)); and dictator-specific excuse values of risk (i.e., the difference $\frac{Y^r(P^r)}{20000} - \frac{Y^s(P^r)}{X}$) (columns (5) and (6)). $P = 0.6$ (respectively, $P = 0.8$) is a dummy variable that equals one if the recipient lottery features a winning probability of 0.6 (respectively, 0.8) and equals zero otherwise; $P = 0.4$ is the omitted category. Trade-off First (Order) is a dummy variable that equals one if a dictator first provided self-peso valuations of recipient lotteries and equals zero if a dictator first provided recipient-peso valuations of recipient lotteries. The results are for our restricted sample of 78 dictators.

Table A6: Robustness of Proposition 5 test results accounting for excuse-driven preferences.

	(1)	(2)	(3)	(4)	(5)	(6)
	Restricted Dictators			Extra-Restricted Dictators		
	Particip	Particip	Particip	Particip	Particip	Particip
β	0.452***	0.482***	0.493***	0.501**	0.578***	0.589***
	(0.107)	(0.114)	(0.115)	(0.194)	(0.177)	(0.169)
λ	-0.369***	-0.374***	-0.383***	-0.422	-0.424	-0.459
	(0.098)	(0.104)	(0.100)	(0.376)	(0.339)	(0.319)
$\beta \times \lambda$	0.824***	0.828***	0.852***	0.910	0.900	0.952
	(0.194)	(0.206)	(0.195)	(0.690)	(0.620)	(0.585)
$\pi(0.5)$	-0.087**	-0.084***	-0.084***	-0.070	-0.065	-0.046
	(0.033)	(0.032)	(0.030)	(0.060)	(0.057)	(0.053)
Mean Excuse		0.088			0.197**	
		(0.080)			(0.074)	
Excuse .4			0.109			0.291*
			(0.143)			(0.157)
Excuse .6			0.030			-0.176
			(0.176)			(0.184)
Excuse .8			-0.064			0.075
			(0.100)			(0.113)
N	702	702	702	468	468	468
R^2	0.177	0.181	0.186	0.162	0.184	0.189

Notes: * p<.1, ** p<.05, ** p<.01. Standard errors are clustered by dictator and shown in parentheses. An observation is at the dictator-task level. In all columns, the dependent variable is a dummy variable that equals one if a dictator allocates a non-zero amount of tokens to the recipient in Task j and equals zero otherwise, where $j = 1, 2, ..., 9$. λ and $\pi(0.5)$ are standardarized by subtracting their means and dividing by their standard deviations (z-scores). Mean Excuse is a dictator's average excuse value of risk across all recipient lotteries in Tasks 11-16. Excuse 'P' is a dictator's excuse value of risk when the recipient lottery features a winning probability $P \in \{0.4, 0.6, 0.8\}$ in Tasks 11-16. The results in columns (1)-(3) are for our restricted sample of 78 dictators, while the results in columns (4)-(6) are for our extra-restricted sample of 52 dictators. Dictators in the extra-restricted sample satisfy the additional restriction (relative to the restricted sample) of at most one switch point in each of Tasks 11-16. For a complete listing and description of the other explanatory variables, see the notes for Table 6.

Table A7: Robustness of Proposition 5 test results with alternative measure of β.

	(1)	(2)	(3)	(4)	(5)	(6)
	Original results with β			Robustness check with β_{BEN}		
	Participation	Participation	Participation	Participation	Participation	Participation
β	0.331***	0.468***	0.452***			
	(0.107)	(0.114)	(0.107)			
β_{BEN}				0.419***	0.389***	0.349**
				(0.138)	(0.136)	(0.138)
λ	-0.015	-0.455***	-0.369***	-0.025	-0.081	-0.023
	(0.028)	(0.121)	(0.098)	(0.023)	(0.071)	(0.074)
$\beta \times \lambda$		0.894***	0.824***			
		(0.236)	(0.194)			
$\beta_{BEN} \times \lambda$					0.081	0.065
					(0.072)	(0.070)
$\pi(0.5)$			-0.087**			-0.079*
			(0.033)			(0.042)
N	702	702	702	684	684	684
R^2	0.113	0.154	0.177	0.118	0.123	0.142

Notes: * p<.1, ** p<.05, ** p<.01. Standard errors are clustered by dictator and shown in parentheses. An observation is at the dictator-task level. In all columns, the dependent variable is a dummy variable that equals one if a dictator allocates a non-zero amount of tokens to the recipient in Task j and equals zero otherwise, where $j = 1, 2, ..., 9$. λ and $\pi(0.5)$ are standardized by subtracting their means and dividing by their standard deviations (z-scores). β_{BEN} is the alternative proxy for the guilt aversion parameter, β, based on the measure introduced by Blanco, Engelmann, and Norman (2011). We obtained β_{BEN} from dictators' choices in Task 17. Columns (1)-(3) reproduce the original results (shown in Table 6) with our proxy for β for our restricted sample of 78 dictators. Columns (4)-(6) show the results with β_{BEN} for the 76 dictators who satisfy the additional restriction (relative to the restricted sample) of at most one switch point in Task 17. For a complete listing and description of the other explanatory variables, see the notes for Table 6.

Table A8: Robustness of Proposition 5 test results with β_{BEN} under various transformations of λ.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Participation: Restricted Dictators									
	Baseline	Baseline	T/B code	T/B code	IHS	IHS	Rank	Rank	High/Low	High/Low
β_{BEN}	0.389***	0.349**	0.354***	0.349***	0.373***	0.389***	0.376***	0.444***	0.254	0.262
	(0.136)	(0.138)	(0.129)	(0.128)	(0.126)	(0.120)	(0.129)	(0.127)	(0.158)	(0.162)
λ	-0.081	-0.023	-0.096**	-0.071*	-0.058	-0.014	-0.049	-0.007	-0.099	-0.036
	(0.071)	(0.074)	(0.037)	(0.036)	(0.043)	(0.041)	(0.054)	(0.054)	(0.111)	(0.113)
$\beta_{BEN} \times \lambda$	0.081	0.065	0.107**	0.146**	0.066	0.138*	0.076	0.131	0.247	0.276
	(0.072)	(0.070)	(0.052)	(0.063)	(0.062)	(0.072)	(0.092)	(0.088)	(0.218)	(0.211)
$\pi(0.5)$		-0.079*		-0.067		-0.098**		-0.094**		-0.080**
		(0.042)		(0.040)		(0.047)		(0.045)		(0.038)
N	684	684	684	684	684	684	684	684	684	684
R^2	0.123	0.142	0.139	0.152	0.123	0.147	0.120	0.145	0.120	0.144

Notes: * p<.1, ** p<.05, *** p<.01. Standard errors are clustered by dictator and shown in parentheses. An observation is at the dictator-task level. In all specifications, the dependent variable equals one if dictator i gives more than zero tokens in Task j and equals zero otherwise, where $j = 1, 2, ..., 9$. The estimation sample is a restricted sub-sample of 76 dictators with a single switch point in each of Tasks 10, 17, 18, and 19. The key explanatory variables are β_{BEN}, an alternative measure of guilt aversion based on the measure introduced by Blanco, Engelmann, and Norman (2011); λ, our preferred measure of loss aversion; their interaction; and $\pi(0.5)$, a measure of subjective probability weighting at the probability one-half. λ and $\pi(0.5)$ are standardized by subtracting their means and dividing by their standard deviations (z-scores). The first two columns, labeled "Baseline," repeat the results from Columns (5) and (6) of Table A7. For a complete listing of the other explanatory variables, see the notes for Table 6. The remaining columns estimate variants of the same model under various transformations of λ. Columns (3) and (4), labeled "T/B Code," show the results when we top/bottom code λ at its 95th/5th percentiles before standardizing. Columns (5) and (6), labeled "IHS," take the inverse hyperbolic sine of λ before standardizing. The inverse hyperbolic sine function is $f(x) = \ln\left(x + \sqrt{1 + x^2}\right)$. It is similar to a log transformation that accommodates values of x that are not strictly greater than zero. Columns (7) and (8), labeled "Rank," discard the cardinal information contained in λ and rank each dictator in ascending order of λ (1 is the smallest). The regressor is the standardization of the rank. Columns (9) and (10), labeled "High/Low," classify dictators into two groups: those with λ above the median and those with λ below (or equal to) the median. The regressor is an indicator that equals one if the dictator is in the "high" category.

Table A9: Giving by role: recipients vs. dictators. Regression analysis.

	(1)	(2)	(3)	(4)	(5)	(6)
	Tokens		Participation		Tokens | > 0	
	Tobit	Tobit	OLS	OLS	OLS	OLS
Dictator	-1.190*	-0.777	-0.027	-0.020	-0.961*	-0.608
	(0.714)	(0.695)	(0.037)	(0.035)	(0.530)	(0.543)
Female		0.272		0.079**		-0.841
		(0.697)		(0.037)		(0.529)
Age		-0.122		-0.002		-0.126
		(0.114)		(0.006)		(0.088)
Semester		-0.205		-0.015**		-0.033
		(0.132)		(0.007)		(0.102)
Economics/Finance Major		-2.044***		-0.072*		-1.358**
		(0.730)		(0.036)		(0.563)
Previous Lab Experience		-1.115		-0.067		-0.341
		(0.803)		(0.041)		(0.604)
Bogotá		1.366		0.053		0.823
		(0.841)		(0.046)		(0.679)
Stratum		-0.061		-0.009		0.087
		(0.429)		(0.024)		(0.309)
Constant	6.147***	9.911***	0.800***	0.916***	8.480***	11.214***
	(0.494)	(2.777)	(0.027)	(0.156)	(0.360)	(2.094)
N	1977	1977	1977	1977	1554	1554
R^2			0.001	0.049	0.009	0.044
pseudo R^2	0.001	0.011				

Notes: * p<.1, ** p<.05, ** p<.01. Standard errors are clustered by individual and shown in parentheses. An observation is at the participant-task level. In columns (1)-(3), the dependent variable is the number of tokens given (if the individual is a dictator) or expected (if the individual is a recipient) in Task j, where $j = 1, 2, ..., 9$. In columns (3)-(4), the dependent variable is a dummy variable that equals one if the individual gave (dictator) or expected (recipient) a non-zero amount of tokens in Task j and equals zero otherwise. In columns (5)-(6), the dependent variable is the number of tokens given (dictator) or expected (recipient), conditional on giving or expecting a non-zero amount. Dictator is a dummy variable that equals one if an individual is a dictator and equals zero if an individual is a recipient. The results are for our full sample of 110 dictators and 110 recipients. Three observations are missing: one dictator did not indicate the number of tokens given in the decision sheet for Task 9; and two recipients did not indicate the expected number of tokens in Task 1 and Task 4, respectively.

Table A10: Testing Propositions 1-3 with data on recipients' expectations.

	(1)	(2)	(3)	(4)	(5)	(6)
	Participation		Tokens $\mid > 0$		Tokens $\mid$ Always Participate	
	Full Sample	Restricted	Full Sample	Restricted	Full Sample	Restricted
$\mathbb{I}(\phi = 2)$	0.082***	0.098***	-0.760***	-0.433	-0.453	0.185
	(0.020)	(0.023)	(0.269)	(0.291)	(0.307)	(0.274)
$\mathbb{I}(\phi = 3)$	0.061**	0.077***	-0.354	-0.177	-0.333	0.287
	(0.026)	(0.028)	(0.388)	(0.460)	(0.491)	(0.595)
$\mathbb{I}(p = 20)$	0.032	0.044	0.012	0.112	0.057	0.213
	(0.028)	(0.034)	(0.383)	(0.444)	(0.510)	(0.602)
$\mathbb{I}(p = 40)$	0.013	0.018	-0.899*	-0.579	-1.673***	-1.241*
	(0.037)	(0.046)	(0.470)	(0.547)	(0.566)	(0.666)
Constant	0.737***	0.695***	9.160***	8.948***	9.878***	9.370***
	(0.025)	(0.031)	(0.380)	(0.449)	(0.476)	(0.549)
N	988	710	790	550	477	324
R^2	0.017	0.025	0.023	0.011	0.061	0.043
Test: $\mathbb{I}(\phi = 2) = \mathbb{I}(\phi = 3)$	0.289	0.322	0.191	0.428	0.775	0.829
Test: $\mathbb{I}(p = 20) = \mathbb{I}(p = 40)$	0.444	0.401	0.007	0.084	0.000	0.002

Notes: * p<.1, ** p<.05, *** p<.01. Standard errors are clustered by recipient and shown in parentheses. Observations are at the recipient-task level. This table is the analog of Table 4 using data for recipients instead of dictators. Columns (1) and (2) display estimates of Equation (11). Columns (3) through (6) display estimates of Equation (12). All specifications include individual fixed effects. Participation equals one if a recipient expected a dictator to give more than zero tokens and equals zero otherwise. Tokens $\mid > 0$ is the number of tokens a recipient expected to receive conditional on expecting a non-zero amount to be given. The variables with labels of the form $\mathbb{I}(A)$ are indicator variables for different values of p and ϕ. They equal one if the expression A is true and equal zero otherwise. "Full Sample" refers to all 110 recipients. "Restricted" refers to the sub-sample of 79 recipients with a single switch point in Task 10. Columns (5) and (6) limit the sample to recipients that expect the dictator to give non-zero amounts in all nine dictator game tasks.

Table A11: Testing Proposition 4 with data on recipients' expectations.

	(1)	(2)	(3)	(4)	(5)	(6)
	Tokens		Participation		Tokens $\mid > 0$	
	Tobit	Tobit	OLS	OLS	OLS	OLS
POSITIVE condition	-0.187	-0.039	-0.019	-0.019	0.179	0.390
	(0.999)	(0.980)	(0.053)	(0.055)	(0.720)	(0.693)
Female		0.553		0.116**		-0.962
		(0.941)		(0.049)		(0.702)
Age		0.527*		0.018		0.307
		(0.318)		(0.021)		(0.209)
Semester		-0.419**		-0.022*		-0.161
		(0.196)		(0.012)		(0.153)
Economics/Finance Major		-1.524		-0.069		-0.690
		(1.126)		(0.062)		(0.803)
Previous Lab Experience		-1.345		-0.031		-1.016
		(1.157)		(0.060)		(0.829)
Bogotá		2.301**		0.044		1.960***
		(1.126)		(0.077)		(0.654)
Stratum		-0.085		-0.012		0.147
		(0.665)		(0.035)		(0.459)
Constant	6.222***	-2.831	0.809***	0.570	8.391***	1.940
	(0.747)	(5.173)	(0.039)	(0.357)	(0.581)	(3.146)
N	988	988	988	988	790	790
R^2			0.001	0.053	0.000	0.054
pseudo R^2	0.000	0.010				

Notes: * p<.1, ** p<.05, *** p<.01. Standard errors are clustered by recipient and shown in parentheses. Observations are at the recipient-task level. This table presents results analogous to those in Table 5 using data on recipient expectations about dictator giving behavior instead of actual dictator choices. Tokens (columns (1) & (2)) is the unconditional number of tokens a recipient expected the dictator to give. Participation (columns (3) & (4)) equals one if a recipient expected the dictator to give more than zero tokens and equals zero otherwise. Tokens $\mid > 0$ (columns (5) & (6)) is the number of tokens a recipient expected to receive conditional on expecting a non-zero amount to be given. POSITIVE condition equals one if a dictator-recipient pair was assigned the POSITIVE ENDOWMENT experimental condition and equals zero otherwise. Estimates are for the full sample of 110 recipients.

Table A12: Alternative model predictions vs. results from the data.

	Amount Targeting	Probability Targeting	Hybrid Selfishness and Probability Targeting	Data
Participation:				
Effect of ϕ	$= 0$	$= 0$	$\begin{cases} \geq 0 & \text{if } \gamma > 1 \\ = 0 & \text{if } \gamma = 1 \end{cases}$	> 0
Effect of p	$= 0$	≤ 0	≤ 0	$= 0$
At interior solution:				
$\frac{\partial q^*}{\partial p}$	> 0	$= 0$	$= 0$	> 0
$\frac{\partial q^*}{\partial \phi}$	> 0	$= 0$	$\begin{cases} > 0 & \text{if } \gamma > 1 \\ = 0 & \text{if } \gamma = 1 \end{cases}$	> 0
$\frac{\partial x^*}{\partial p}$	$= 0$	< 0	< 0	< 0
$\frac{\partial x^*}{\partial \phi}$	$= 0$	< 0	indeterminate	< 0

Notes: The first three columns summarize the predictions of three alternative models of giving behavior. (See Appendix D.) The fourth column ("Data") summarizes the data. For participation (giving a non-zero amount) and the number of tokens given, x^*, the results in the "Data" column are a summary of the results reported in Table 4. The results for q^* are from Table A14. q^* is the implied winning probability for the recipient (expressed as a percentage) when the dictator gives x^* tokens: $q^* = p + \phi x^*$. Model predictions in blue are supported by the data; those in red are rejected.

Table A13: Summary statistics for x^* and q^*. Dictators.

	Count	Fraction
x^* always > 0	49	0.45
x^* always $\in (0, 20)$	39	0.35
x^* ever $= 0$	61	0.55
x^* ever $= 20$	17	0.15
x^* constant	3	0.03
x^* constant $= 0$	2	0.02
x^* constant $= 20$	0	0.00
x^* constant $\in (0, 20)$	1	0.01
$\lvert\max(q^*) - \min(q^*)\rvert = 0$ when $x^* \in (0, 20)$	4	0.04
$\lvert\max(q^*) - \min(q^*)\rvert \leq 5$ when $x^* \in (0, 20)$	7	0.06
$\lvert\max(q^*) - \min(q^*)\rvert \leq 10$ when $x^* \in (0, 20)$	8	0.07

Notes: The unit of observation is a dictator. x^* is the number of tokens given. q^* is the implied winning probability for the recipient (expressed as a percentage) when x^* tokens are given: $q^* = p + \phi x^*$. The notation $x^* \in (0, 20)$ refers to instances when the dictator gave an amount strictly between the minimum (zero) and maximum (twenty) number of tokens. In the last three rows, the notation $\max(q^*)$ and $\min(q^*)$ refer to maxima and minima taken *within* a particular dictator across tasks in which the dictator gave strictly interior amounts. Results are for the full sample of 110 dictators.

Table A14: Effect of p and ϕ on implied probability q^*. Dictators. Strictly interior allocations.

	(1)	(2)	(3)	(4)
	$q^* \mid x^* > 0$		$q^* \mid$ Always Participate	
	Full Sample	Restricted	Full Sample	Restricted
$\mathbb{I}(\phi = 2)$	5.8***	5.9***	6.2***	6.4***
	(0.4)	(0.5)	(0.5)	(0.5)
$\mathbb{I}(\phi = 3)$	12.6***	12.1***	14.0***	14.0***
	(0.8)	(0.9)	(1.0)	(1.2)
$\mathbb{I}(p = 20)$	18.0***	18.7***	18.2***	19.2***
	(0.7)	(0.8)	(0.9)	(1.1)
$\mathbb{I}(p = 40)$	36.1***	36.6***	35.3***	35.7***
	(0.8)	(0.9)	(1.0)	(1.1)
Constant	9.5***	8.6***	11.1***	10.2***
	(0.6)	(0.7)	(0.8)	(0.9)
N	727	490	417	284
R^2	0.874	0.887	0.874	0.892
Test: $\mathbb{I}(\phi = 2) = \mathbb{I}(\phi = 3)$	0.000	0.000	0.000	0.000
Test: $\mathbb{I}(p = 20) = \mathbb{I}(p = 40)$	0.000	0.000	0.000	0.000

Notes: * p<.1, ** p<.05, *** p<.01. Standard errors are clustered by dictator and shown in parentheses. An observation is at the dictator-task level. The dependent variable in all specifications is q^*, which is the implied winning probability for the recipient (expressed as a percentage) when the dictator gives x^* tokens: $q^* = p + \phi x^*$. The variables with labels of the form $\mathbb{I}(A)$ are indicator variables for different values of p and ϕ. They equal one if A is true and equal zero otherwise. All models include individual fixed effects. In Columns (1) and (2), the sample is restricted to observations in which dictators gave strictly interior amounts: $x^* \in (0, 20)$. In Columns (3) and (4), the sample is additionally restricted to include only dictators who always participate, meaning that they always give non-zero amounts. (These dictators did not necessarily give strictly interior amounts in all tasks.) "Full Sample" refers to all 110 dictators. "Restricted" refers to the sub-sample of 78 dictators with a single switch point in each of Tasks 10, 18, and 19. The numbers in the final two rows of the table are p-values.

APPENDIX, SECTION E: EXPERIMENTAL INSTRUCTIONS AND PROCEDURES

Below are the general instructions and the specific instructions for dictators translated into English, together with a description of the procedures that were followed in the experimental sessions. Details about procedures are interspersed between portions of instructions; they appear in brackets and in italics. Within the instructions, the text in brackets appears only in the POSITIVE ENDOWMENT condition, whereas the text in braces and in italics appears only in the ZERO ENDOWMENT condition.

The full set of experimental instructions, including specific instructions for recipients, can be found at https://sites.google.com/site/santiagoisautua/research or https://sites.google.com/site/seanpfahle/research.

[Participants find the following general instructions on their desks upon entering the lab. After they fill out and sign the consent form, one of the experimenters reads the instructions aloud.]

GENERAL INSTRUCTIONS

Welcome to this session. Thanks for coming.

This session will take about 90 minutes. You will receive 10,000 COP (Colombian pesos) for your participation if you complete the study. In the session, you will also have the opportunity to earn additional money. All payments will be made in cash at the end of the session and will be confidential.

In this study, you will participate in a series of games and answer a short questionnaire. Your decisions and questionnaire responses will be kept strictly confidential.

Before we begin, we ask you to respect the following guidelines:

- No talking is allowed. If you have any questions during the study, please raise your hand. One of the laboratory assistants will come to your place and answer your question privately.
- Every participant's task is individual and should be completed in private. Do not look at what other participants are doing.

If you do not comply with these rules, we will be forced to exclude you from the study. Thank you for your cooperation.

In a moment, we will divide participants in two groups. Each participant from Group 1 will be randomly matched with one participant from Group 2. You will not know with whom you are matched.

Group 1 participants will face a series of decision tasks. In each task, each Group 1 participant will allocate resources between herself and her Group 2 anonymous partner.

Group 2 participants will stay in a separate room until the end of the session. They will wait until all Group 1 participants have made all decisions. Then, we will pay all participants in private.

At the end of this session, one of the decision tasks will be randomly selected as the **task-that-counts**. We will pay you in cash the amount of money that you earned in this task. As you will see, the tasks are numbered. To select the task-that-counts, we will randomly draw a numbered piece of paper from a plastic cup. This way, each task has the same chance of being chosen as the task-that-counts. Your payment in the task-that-counts will be added to your 10,000 COP participation fee.

Once we have separated the two groups, we will explain the decision tasks to each group in detail.

Now, we will divide participants in two groups. This bag contains as many balls as there are participants in this session. Half of the balls have 1's and the other half have 2's. You will randomly pick a ball. If you draw a 1, then you will be assigned to Group 1, whereas if you draw a 2, you will be assigned to Group 2.

[Participants draw their number.]

Next, one of the experimenters will give you a closed envelope. *{If you are a Group 1 participant, please raise your hand. One of the experimenters will give you a closed envelope. Now, Group 2 participants will also receive an envelope.}*

Please open your envelope [and check that there are **20,000 COP** inside.] *{If you are a Group 1 participant, there are **20,000 COP** inside, whereas your envelope is empty if you are a Group 2 participant.}* Then, close the envelope. You will keep it with you throughout the session and will use it in the decision tasks.

Should you have any questions or concerns at this point, please raise your hand. Otherwise, we will continue with the session.

If you are a Group 2 participant, please grab the instruction sheets and your envelope. Two experimenters will lead you to the other room.

[Participants from Group 2 go to another room. Next, Group 1 participants (dictators) receive specific instructions; one of the experimenters reads the instructions aloud. In the other room, Group 2 participants (recipients) receive a different set of instructions; one of the experimenters also reads the instructions aloud.]

SPECIFIC INSTRUCTIONS FOR GROUP 1 PARTICIPANTS (DICTATORS)

At your carrel, you will find a sticker with your Participant ID Number. Please write down this number on the envelope and on the front page of each of the forms that you fill out.

As you know, you have been randomly and anonymously matched with a participant from Group 2, whom we shall refer to as Person 2. **You will be Person 1**.

In Tasks #1 - #17, **you will keep your 20,000 COP for sure** and may earn additional money. [On the other hand, **Person 2 may have to return her 20,000 COP to the experimenters**] ***{Person 2 may also earn money}***. This will depend on the outcome of the task-that-counts.

Next, we will explain Tasks #1 - #9.

TASKS #1 - #9

In Tasks #1 - #9, you will make a series of token allocations between you and Person 2. These allocations will affect Person 2's chances of [keeping her 20,000 COP] *{receiving 20,000 COP}* as well as your own payment.

In each task, there are 20 tokens that you have to divide between yourself and Person 2. You can allocate anything between 0 and 20 tokens to Person 2 and take the rest for yourself.

In all tasks, every token that you take for yourself is always worth **500 COP**. On the other hand, the tokens that you allocate to Person 2 will be converted into **lottery tickets**. As we will explain in a moment, each lottery ticket will be a number between 1 and 100.

In each task, Person 2 will play a lottery to determine whether she [gets to keep her 20,000 COP or is required to return them to the experimenters] *{receives 20,000 COP}*. In some tasks, Person 2 will start out with 0 lottery tickets out of a total of 100 tickets; in other tasks, she will start out with some lottery tickets.

By allocating tokens to Person 2, you can increase the number of tickets that Person 2 holds and hence increase her chances of [keeping her] *{receiving}* 20,000 COP. The more tokens you allocate to Person 2, the larger will be her chances of [keeping her] *{receiving}* 20,000 COP, but the smaller will be your own payment.

Each token that you allocate to Person 2 will be worth one, two, or three lottery tickets. This value will vary across tasks.

Let's now take a look at the SAMPLE TASK that appears below.

In this task, Person 2 starts out with **40 out of 100 lottery tickets**. This is shown in the text above the table and also in the first column. The second column displays all your possible choices—you can allocate anything between 0 and 20 tokens to Person 2. In this sample task, each token that you allocate to her is worth **3 lottery tickets**. You can find this information just above the table. The third column displays Person 2's final number of tickets for every possible allocation. Note Person 2's final number of tickets is calculated as follows: (initial number of tickets) + (tokens for Person 2 * ticket value of a token). Finally, the fourth column indicates your sure payment for every possible allocation, including the 20,000 COP that you originally received in the envelope.

Consider some examples of possible allocations. If you allocate **0 tokens** to Person 2, she will end up with **40 out of 100 lottery tickets** (40 initial tickets + 0 tokens for Person 2 * 3 tickets per token = 40 final tickets). Then, Person 2 will [**keep her**] ***{receive}*** **20,000 COP** if a number between 1 and 40 comes out, but she will [**lose her 20,000 COP**] ***{not receive anything}*** if a number between 41 and 100 comes out. You will receive **10,000 COP in addition to your 20,000 COP** (20 tokens for yourself*500 COP each = 10,000 COP).

If you allocate **10 tokens** to Person 2, she will end up with **70 out of 100 lottery tickets**. (40 initial tickets + 10 tokens for Person 2*3 tickets per token = 70 final tickets). Then, Person 2 will [**keep her**] ***{receive}*** **20,000 COP** if a number between 1 and 70 comes out, but she will [**lose her 20,000 COP**] ***{not receive anything}*** if a number between 71 and 100 comes out. You will receive **5,000 COP in addition to your 20,000 COP** (10 tokens for yourself*500 COP each = 5,000 COP).

If instead you allocate **20 tokens** to Person 2, she will end up with **100 lottery tickets**. (40 initial tickets + 20 tokens for Person 2*3 tickets per token = 100 final tickets). Then, Person 2 will [**keep her**] ***{receive}*** **20,000 COP for sure**, while you will receive **nothing in addition to your 20,000 COP**.

Suppose the SAMPLE TASK is the task-that-counts. To resolve the lottery, we will randomly select a number between 1 and 100. We will do this by throwing two identical ten-sided dice: one for the tens digit and one for the ones digit. (Each die has numbers 0 through 9 and 0-0 will be 100.) Suppose you allocated 10 tokens to Person 2, so that she ends up holding 70 tickets. If the selected number is smaller than or equal to 70, then Person 2 [gets to keep her] *{receives}* 20,000 COP. If, on the contrary, this number is larger than 70, then Person 2 [loses her 20,000 COP] *{does not receive anything}*.

SAMPLE TASK

In this task, **Person 2 starts out with <u>40 out of 100 lottery tickets</u>.**

You can allocate anything between 0 and 20 tokens to Person 2.

Each token that you allocate to her is worth <u>3 lottery tickets</u>.

Each token that you take for yourself is worth 500 COP.

Initial number of tickets for Person 2	Tokens for Person 2	Final number of tickets for Person 2	Your payoff in COP (including your 20,000 COP)
40 out of 100	0	40 out of 100	30,000
40 out of 100	1	43 out of 100	29,500
40 out of 100	2	46 out of 100	29,000
40 out of 100	3	49 out of 100	28,500
40 out of 100	4	52 out of 100	28,000
40 out of 100	5	55 out of 100	27,500
40 out of 100	6	58 out of 100	27,000
40 out of 100	7	61 out of 100	26,500
40 out of 100	8	64 out of 100	26,000
40 out of 100	9	67 out of 100	25,500
40 out of 100	10	70 out of 100	25,000
40 out of 100	11	73 out of 100	24,500
40 out of 100	12	76 out of 100	24,000
40 out of 100	13	79 out of 100	23,500
40 out of 100	14	82 out of 100	23,000
40 out of 100	15	85 out of 100	22,500
40 out of 100	16	88 out of 100	22,000
40 out of 100	17	91 out of 100	21,500
40 out of 100	18	94 out of 100	21,000
40 out of 100	19	97 out of 100	20,500
40 out of 100	20	100 out of 100	20,000

[Next, participants receive the following instructions to complete a comprehension check. One of the experimenters reads the instructions aloud. Once a participant completes the task, one of the experimenters comes by their workstation and checks her answers. If there is a mistake, the experimenter asks the participant to answer the question again until she provides the correct answer. After reviewing participants' answers and resolving doubts in private, experimenters collect the answer sheets.]

Participant ID #: ________

COMPREHENSION CHECK

The following four questions are intended to test your comprehension of the instructions for Tasks #1 - #9.

Refer to the table that appears on the next page when answering the questions.

Suppose you have decided to allocate **10 tokens** to Person 2 and this task is selected as the task-that-counts.

1. How many lottery tickets would Person 2 receive **in addition** to those she already has?

Your answer: __________

2. What would Person 2's **final** number of tickets be?

Your answer: __________

3. How much money would you (Person 1) receive from this task?

Your answer: __________

4. If number **70** came out in the lottery, would Person 2 [keep her] {*receive*} 20,000 COP?

Your answer: __________

Please raise your hand once you are done. One of the experimenters will go to your desk to check your answers. Should you have any doubt, the assistant will resolve it.

Participant ID #: ________

COMPREHENSION CHECK

In this task, **Person 2 starts out with <u>20 out of 100 lottery tickets</u>.**

You can allocate anything between 0 and 20 tokens to Person 2.

Each token that you allocate to her is worth <u>2 lottery tickets</u>.

Each token that you take for yourself is worth 500 COP.

Initial number of tickets for Person 2	Tokens for Person 2	Final number of tickets for Person 2	Your payoff in COP (including your 20,000 COP)
20 out of 100	0	20 out of 100	30,000
20 out of 100	1	22 out of 100	29,500
20 out of 100	2	24 out of 100	29,000
20 out of 100	3	26 out of 100	28,500
20 out of 100	4	28 out of 100	28,000
20 out of 100	5	30 out of 100	27,500
20 out of 100	6	32 out of 100	27,000
20 out of 100	7	34 out of 100	26,500
20 out of 100	8	36 out of 100	26,000
20 out of 100	9	38 out of 100	25,500
20 out of 100	10	40 out of 100	25,000
20 out of 100	11	42 out of 100	24,500
20 out of 100	12	44 out of 100	24,000
20 out of 100	13	46 out of 100	23,500
20 out of 100	14	48 out of 100	23,000
20 out of 100	15	50 out of 100	22,500
20 out of 100	16	52 out of 100	22,000
20 out of 100	17	54 out of 100	21,500
20 out of 100	18	56 out of 100	21,000
20 out of 100	19	58 out of 100	20,500
20 out of 100	20	60 out of 100	20,000

[Participants receive the following additional instructions for Tasks #1 - #9, together with the block of answer sheets. One of the experimenters reads the instructions aloud. Answer sheets are collected upon completion.]

Next, you will complete Tasks #1 - #9. You can complete them in any order. **In each task, please circle on the table the number of tokens that you want to allocate to Person 2. (That is, you have to circle a number between 0 and 20 in column 2.)**

Recall that each of the 9 tasks could be the task-that-counts. So, it is in your interest to treat each task as if it were the one that determines both your payment and Person 2's.

Once you are satisfied with all your allocations, please raise your hand. One of the experimenters will collect your forms and then we will continue.

Participant ID #: ________

TASK #1

In this task, **Person 2 starts out with <u>0 out of 100 lottery tickets</u>.**

You can allocate anything between 0 and 20 tokens to Person 2.

Each token that you allocate to her is worth <u>1 lottery ticket</u>.

Each token that you take for yourself is worth 500 COP.

Initial number of tickets for Person 2	Tokens for Person 2	Final number of tickets for Person 2	Your payoff in COP (including your 20,000 COP)
0 out of 100	0	0 out of 100	30,000
0 out of 100	1	1 out of 100	29,500
0 out of 100	2	2 out of 100	29,000
0 out of 100	3	3 out of 100	28,500
0 out of 100	4	4 out of 100	28,000
0 out of 100	5	5 out of 100	27,500
0 out of 100	6	6 out of 100	27,000
0 out of 100	7	7 out of 100	26,500
0 out of 100	8	8 out of 100	26,000
0 out of 100	9	9 out of 100	25,500
0 out of 100	10	10 out of 100	25,000
0 out of 100	11	11 out of 100	24,500
0 out of 100	12	12 out of 100	24,000
0 out of 100	13	13 out of 100	23,500
0 out of 100	14	14 out of 100	23,000
0 out of 100	15	15 out of 100	22,500
0 out of 100	16	16 out of 100	22,000
0 out of 100	17	17 out of 100	21,500
0 out of 100	18	18 out of 100	21,000
0 out of 100	19	19 out of 100	20,500
0 out of 100	20	20 out of 100	20,000

Participant ID #: ________

TASK #2

In this task, **Person 2 starts out with <u>0 out of 100 lottery tickets</u>.**

You can allocate anything between 0 and 20 tokens to Person 2.

Each token that you allocate to her is worth <u>2 lottery tickets</u>.

Each token that you take for yourself is worth 500 COP.

Initial number of tickets for Person 2	Tokens for Person 2	Final number of tickets for Person 2	Your payoff in COP (including your 20,000 COP)
0 out of 100	0	0 de 100	30,000
0 out of 100	1	2 de 100	29,500
0 out of 100	2	4 de 100	29,000
0 out of 100	3	6 de 100	28,500
0 out of 100	4	8 de 100	28,000
0 out of 100	5	10 de 100	27,500
0 out of 100	6	12 de 100	27,000
0 out of 100	7	14 de 100	26,500
0 out of 100	8	16 de 100	26,000
0 out of 100	9	18 de 100	25,500
0 out of 100	10	20 de 100	25,000
0 out of 100	11	22 de 100	24,500
0 out of 100	12	24 de 100	24,000
0 out of 100	13	26 de 100	23,500
0 out of 100	14	28 de 100	23,000
0 out of 100	15	30 de 100	22,500
0 out of 100	16	32 de 100	22,000
0 out of 100	17	34 de 100	21,500
0 out of 100	18	36 de 100	21,000
0 out of 100	19	38 de 100	20,500
0 out of 100	20	40 de 100	20,000

Participant ID #: ________

TASK #3

In this task, **Person 2 starts out with <u>0 out of 100 lottery tickets</u>.**

You can allocate anything between 0 and 20 tokens to Person 2.

Each token that you allocate to her is worth <u>3 lottery tickets</u>.

Each token that you take for yourself is worth 500 COP.

Initial number of tickets for Person 2	Tokens for Person 2	Final number of tickets for Person 2	Your payoff in COP (including your 20,000 COP)
0 out of 100	0	0 out of 100	30,000
0 out of 100	1	3 out of 100	29,500
0 out of 100	2	6 out of 100	29,000
0 out of 100	3	9 out of 100	28,500
0 out of 100	4	12 out of 100	28,000
0 out of 100	5	15 out of 100	27,500
0 out of 100	6	18 out of 100	27,000
0 out of 100	7	21 out of 100	26,500
0 out of 100	8	24 out of 100	26,000
0 out of 100	9	27 out of 100	25,500
0 out of 100	10	30 out of 100	25,000
0 out of 100	11	33 out of 100	24,500
0 out of 100	12	36 out of 100	24,000
0 out of 100	13	39 out of 100	23,500
0 out of 100	14	42 out of 100	23,000
0 out of 100	15	45 out of 100	22,500
0 out of 100	16	48 out of 100	22,000
0 out of 100	17	51 out of 100	21,500
0 out of 100	18	54 out of 100	21,000
0 out of 100	19	57 out of 100	20,500
0 out of 100	20	60 out of 100	20,000

Participant ID #: ________

TASK #4

In this task, **Person 2 starts out with <u>20 out of 100 lottery tickets</u>.**

You can allocate anything between 0 and 20 tokens to Person 2.

Each token that you allocate to her is worth <u>1 lottery ticket</u>.

Each token that you take for yourself is worth 500 COP.

Initial number of tickets for Person 2	Tokens for Person 2	Final number of tickets for Person 2	Your payoff in COP (including your 20,000 COP)
20 out of 100	0	20 de 100	30,000
20 out of 100	1	21 de 100	29,500
20 out of 100	2	22 de 100	29,000
20 out of 100	3	23 de 100	28,500
20 out of 100	4	24 de 100	28,000
20 out of 100	5	25 de 100	27,500
20 out of 100	6	26 de 100	27,000
20 out of 100	7	27 de 100	26,500
20 out of 100	8	28 de 100	26,000
20 out of 100	9	29 de 100	25,500
20 out of 100	10	30 de 100	25,000
20 out of 100	11	31 de 100	24,500
20 out of 100	12	32 de 100	24,000
20 out of 100	13	33 de 100	23,500
20 out of 100	14	34 de 100	23,000
20 out of 100	15	35 de 100	22,500
20 out of 100	16	36 de 100	22,000
20 out of 100	17	37 de 100	21,500
20 out of 100	18	38 de 100	21,000
20 out of 100	19	39 de 100	20,500
20 out of 100	20	40 de 100	20,000

Participant ID #: ________

TASK #5

In this task, **Person 2 starts out with <u>20 out of 100 lottery tickets</u>.**

You can allocate anything between 0 and 20 tokens to Person 2.

Each token that you allocate to her is worth <u>2 lottery tickets</u>.

Each token that you take for yourself is worth 500 COP.

Initial number of tickets for Person 2	Tokens for Person 2	Final number of tickets for Person 2	Your payoff in COP (including your 20,000 COP)
20 out of 100	0	20 out of 100	30,000
20 out of 100	1	22 out of 100	29,500
20 out of 100	2	24 out of 100	29,000
20 out of 100	3	26 out of 100	28,500
20 out of 100	4	28 out of 100	28,000
20 out of 100	5	30 out of 100	27,500
20 out of 100	6	32 out of 100	27,000
20 out of 100	7	34 out of 100	26,500
20 out of 100	8	36 out of 100	26,000
20 out of 100	9	38 out of 100	25,500
20 out of 100	10	40 out of 100	25,000
20 out of 100	11	42 out of 100	24,500
20 out of 100	12	44 out of 100	24,000
20 out of 100	13	46 out of 100	23,500
20 out of 100	14	48 out of 100	23,000
20 out of 100	15	50 out of 100	22,500
20 out of 100	16	52 out of 100	22,000
20 out of 100	17	54 out of 100	21,500
20 out of 100	18	56 out of 100	21,000
20 out of 100	19	58 out of 100	20,500
20 out of 100	20	60 out of 100	20,000

Participant ID #: ________

TASK #6

In this task, **Person 2 starts out with <u>20 out of 100 lottery tickets</u>.**

You can allocate anything between 0 and 20 tokens to Person 2.

Each token that you allocate to her is worth <u>3 lottery tickets</u>.

Each token that you take for yourself is worth 500 COP.

Initial number of tickets for Person 2	Tokens for Person 2	Final number of tickets for Person 2	Your payoff in COP (including your 20,000 COP)
20 out of 100	0	20 out of 100	30,000
20 out of 100	1	23 out of 100	29,500
20 out of 100	2	26 out of 100	29,000
20 out of 100	3	29 out of 100	28,500
20 out of 100	4	32 out of 100	28,000
20 out of 100	5	35 out of 100	27,500
20 out of 100	6	38 out of 100	27,000
20 out of 100	7	41 out of 100	26,500
20 out of 100	8	44 out of 100	26,000
20 out of 100	9	47 out of 100	25,500
20 out of 100	10	50 out of 100	25,000
20 out of 100	11	53 out of 100	24,500
20 out of 100	12	56 out of 100	24,000
20 out of 100	13	59 out of 100	23,500
20 out of 100	14	62 out of 100	23,000
20 out of 100	15	65 out of 100	22,500
20 out of 100	16	68 out of 100	22,000
20 out of 100	17	71 out of 100	21,500
20 out of 100	18	74 out of 100	21,000
20 out of 100	19	77 out of 100	20,500
20 out of 100	20	80 out of 100	20,000

Participant ID #: ________

TASK #7

In this task, **Person 2 starts out with <u>40 out of 100 lottery tickets</u>.**

You can allocate anything between 0 and 20 tokens to Person 2.

Each token that you allocate to her is worth <u>1 lottery ticket</u>.

Each token that you take for yourself is worth 500 COP.

Initial number of tickets for Person 2	Tokens for Person 2	Final number of tickets for Person 2	Your payoff in COP (including your 20,000 COP)
40 out of 100	0	40 out of 100	30,000
40 out of 100	1	41 out of 100	29,500
40 out of 100	2	42 out of 100	29,000
40 out of 100	3	43 out of 100	28,500
40 out of 100	4	44 out of 100	28,000
40 out of 100	5	45 out of 100	27,500
40 out of 100	6	46 out of 100	27,000
40 out of 100	7	47 out of 100	26,500
40 out of 100	8	48 out of 100	26,000
40 out of 100	9	49 out of 100	25,500
40 out of 100	10	50 out of 100	25,000
40 out of 100	11	51 out of 100	24,500
40 out of 100	12	52 out of 100	24,000
40 out of 100	13	53 out of 100	23,500
40 out of 100	14	54 out of 100	23,000
40 out of 100	15	55 out of 100	22,500
40 out of 100	16	56 out of 100	22,000
40 out of 100	17	57 out of 100	21,500
40 out of 100	18	58 out of 100	21,000
40 out of 100	19	59 out of 100	20,500
40 out of 100	20	60 out of 100	20,000

Participant ID #: ________

TASK #8

In this task, **Person 2 starts out with <u>40 out of 100 lottery tickets</u>.**

You can allocate anything between 0 and 20 tokens to Person 2.

Each token that you allocate to her is worth <u>2 lottery tickets</u>.

Each token that you take for yourself is worth 500 COP.

Initial number of tickets for Person 2	Tokens for Person 2	Final number of tickets for Person 2	Your payoff in COP (including your 20,000 COP)
40 out of 100	0	40 out of 100	30,000
40 out of 100	1	42 out of 100	29,500
40 out of 100	2	44 out of 100	29,000
40 out of 100	3	46 out of 100	28,500
40 out of 100	4	48 out of 100	28,000
40 out of 100	5	50 out of 100	27,500
40 out of 100	6	52 out of 100	27,000
40 out of 100	7	54 out of 100	26,500
40 out of 100	8	56 out of 100	26,000
40 out of 100	9	58 out of 100	25,500
40 out of 100	10	60 out of 100	25,000
40 out of 100	11	62 out of 100	24,500
40 out of 100	12	64 out of 100	24,000
40 out of 100	13	66 out of 100	23,500
40 out of 100	14	68 out of 100	23,000
40 out of 100	15	70 out of 100	22,500
40 out of 100	16	72 out of 100	22,000
40 out of 100	17	74 out of 100	21,500
40 out of 100	18	76 out of 100	21,000
40 out of 100	19	78 out of 100	20,500
40 out of 100	20	80 out of 100	20,000

Participant ID #: ________

TASK #9

In this task, **Person 2 starts out with <u>40 out of 100 lottery tickets</u>.**

You can allocate anything between 0 and 20 tokens to Person 2.

Each token that you allocate to her is worth <u>3 lottery tickets</u>.

Each token that you take for yourself is worth 500 COP.

Initial number of tickets for Person 2	Tokens for Person 2	Final number of tickets for Person 2	Your payoff in COP (including your 20,000 COP)
40 out of 100	0	40 out of 100	30,000
40 out of 100	1	43 out of 100	29,500
40 out of 100	2	46 out of 100	29,000
40 out of 100	3	49 out of 100	28,500
40 out of 100	4	52 out of 100	28,000
40 out of 100	5	55 out of 100	27,500
40 out of 100	6	58 out of 100	27,000
40 out of 100	7	61 out of 100	26,500
40 out of 100	8	64 out of 100	26,000
40 out of 100	9	67 out of 100	25,500
40 out of 100	10	70 out of 100	25,000
40 out of 100	11	73 out of 100	24,500
40 out of 100	12	76 out of 100	24,000
40 out of 100	13	79 out of 100	23,500
40 out of 100	14	82 out of 100	23,000
40 out of 100	15	85 out of 100	22,500
40 out of 100	16	88 out of 100	22,000
40 out of 100	17	91 out of 100	21,500
40 out of 100	18	94 out of 100	21,000
40 out of 100	19	97 out of 100	20,500
40 out of 100	20	100 out of 100	20,000

[Participants receive this instruction sheet for Tasks #10 - #17, and one of the experimenters reads the instructions aloud.]

TASKS #10 - #17

In each of Tasks #10 - #17, you are asked to make a series of choices between two options— **Option A** and **Option B**. In each task, choices are presented in a list with 21 rows.

As an example, the following is the first row of one of the lists that you will find in Tasks #10 - #17 (the row number is shown next to the row):

	Option A	A	B	Option B
1	Person 2 [keeps her] *{receives}* 20,000 COP for sure			You: $0

Option A is the initial option and **Option B** is the alternative option. For each row, **you have to decide whether you prefer to keep Option A or switch to Option B**.

- If you prefer to keep Option A, then check the A box:

	Option A	A	B	Option B
1	Person 2 [keeps her] *{receives}* 20,000 COP for sure	**X**		You: $0

- If you prefer to switch to Option B, then check the B box:

	Option A	A	B	Option B
1	Person 2 [keeps her] *{receives}* 20,000 COP for sure		**X**	You: $0

One way to complete the list is to determine in which row you want to switch from Option A to Option B. You do not necessarily have to switch; if you want to, you can keep Option A in all rows.

If one of Tasks #10 - #17 is selected as the task-that-counts, one of the experimenters will randomly draw a number between 1 and 21 from a plastic cup to select the row-that-counts. The choice that you made on the row-that-counts will determine both your payment and Person 2's payment.

[Participants receive instructions for Task #10, and one of the experimenters reads the instructions aloud. To complete the task, Group 1 participants use the computer in addition to the answer sheet. The computer is needed because a participant's valuation from Task #10 determines the maximum sure amount that she later faces in Option B in Tasks #14 - #16. (See the discussion of these tasks for more detail.) Answer sheets are collected upon completion.]

Participant ID #: ________

TASK #10

To complete this task, you will use the computer and this sheet. Consider the list below:

- **Option A** will be **Person 2** [keeps her] *{receives}* 20,000 COP for sure and **you** receive nothing in addition to your 20,000 COP

- **Option B** will be **Person 2** [loses her 20,000 COP for sure] *{does not receive anything}* and **you** receive some peso amount that will be added to your 20,000 COP. As you proceed down the rows of the list, the amount you receive will increase from 0 COP to 20,000 COP.

For each row, you have to decide whether you prefer to keep Option A or switch to Option B.

Please indicate your preference by checking the corresponding option on the table below. Once you are satisfied with all your choices, please copy them in the table that appears on the screen.

Please raise your hand once you are done.

	Option A	A	B	Option B
1	Person 2 [keeps her] *{receives}* 20,000 COP for sure			You: $0
2	Person 2 [keeps her] *{receives}* 20,000 COP for sure			You: $1,000
3	Person 2 [keeps her] *{receives}* 20,000 COP for sure			You: $2,000
4	Person 2 [keeps her] *{receives}* 20,000 COP for sure			You: $3,000
5	Person 2 [keeps her] *{receives}* 20,000 COP for sure			You: $4,000
6	Person 2 [keeps her] *{receives}* 20,000 COP for sure			You: $5,000
7	Person 2 [keeps her] *{receives}* 20,000 COP for sure			You: $6,000
8	Person 2 [keeps her] *{receives}* 20,000 COP for sure			You: $7,000
9	Person 2 [keeps her] *{receives}* 20,000 COP for sure			You: $8,000
10	Person 2 [keeps her] *{receives}* 20,000 COP for sure			You: $9,000
11	Person 2 [keeps her] *{receives}* 20,000 COP for sure			You: $10,000
12	Person 2 [keeps her] *{receives}* 20,000 COP for sure			You: $11,000
13	Person 2 [keeps her] *{receives}* 20,000 COP for sure			You: $12,000
14	Person 2 [keeps her] *{receives}* 20,000 COP for sure			You: $13,000
15	Person 2 [keeps her] *{receives}* 20,000 COP for sure			You: $14,000
16	Person 2 [keeps her] *{receives}* 20,000 COP for sure			You: $15,000
17	Person 2 [keeps her] *{receives}* 20,000 COP for sure			You: $16,000
18	Person 2 [keeps her] *{receives}* 20,000 COP for sure			You: $17,000
19	Person 2 [keeps her] *{receives}* 20,000 COP for sure			You: $18,000
20	Person 2 [keeps her] *{receives}* 20,000 COP for sure			You: $19,000
21	Person 2 [keeps her] *{receives}* 20,000 COP for sure			You: $20,000

[In half of the experimental sessions, Group 1 participants first complete Tasks #11 - #13 and then complete Tasks #14 - #16. The order of these two blocks of tasks is reversed in the other half of the sessions.]

[Participants receive instructions for Tasks #11 - #13 as well as the corresponding block of answer sheets. One of the experimenters then reads the instructions aloud. Answer sheets are collected upon completion.]

TASKS #11 - #13

In the following three tasks, you will not receive anything in addition to your 20,000 COP.

In each task, you will face a list featuring two options:

- **Option A** will be **Person 2** plays a lottery to determine whether she [gets to keep her] {*receives*} 20,000 COP

- **Option B** will be **Person 2** receives some peso amount for sure. As you proceed down the rows of the list, the amount Person 2 receives will increase from 0 COP to 20,000 COP.

As an example, consider the decision you face on row 3 from Task #11, which we reproduce next.

- If you keep Option A, then Person 2 will play a lottery in which she will [get to keep her] {*receive*} 20,000 COP if a number smaller than or equal to **40** (out of 100) comes out.

	Option A	**A**	**B**	**Option B**
3	Person 2 [keeps her] {*receives*} 20,000 COP if a number smaller than or equal to 40 comes out	**X**		Person 2: $2,000

- If you switch to Option B, Person 2 will be paid 2,000 COP for sure and will not play the lottery. [This means that Person 2 will keep 2,000 COP from the envelope, but will have to return the remaining 18,000 COP to the experimenters.]

	Option A	**A**	**B**	**Option B**
3	Person 2 [keeps her] {*receives*} 20,000 COP if a number smaller than or equal to 40 comes out		**X**	Person 2: $2,000

For each row, you have to decide whether you prefer to keep Option A or switch to Option B.

Please raise your hand once you have completed Tasks #11 - #13.

Participant ID #: ________

TASK #11

Consider the list below. In this list:

- **Option A** will be **Person 2** plays a lottery in which she will [get to keep her] {*receive*} 20,000 COP if a number smaller than or equal to **40** (out of 100) comes out

- **Option B** will be **Person 2** receives some peso amount for sure. As you proceed down the rows of the list, the amount Person 2 receives will increase from 0 COP to 20,000 COP.

For each row, you have to decide whether you prefer to keep Option A or switch to Option B.

	Option A	A	B	Option B	
1	Person 2 [keeps her] {*receives*} 20,000 COP if a number smaller than or equal to 40 comes out			Person 2:	$0
2	Person 2 [keeps her] {*receives*} 20,000 COP if a number smaller than or equal to 40 comes out			Person 2:	$1,000
3	Person 2 [keeps her] {*receives*} 20,000 COP if a number smaller than or equal to 40 comes out			Person 2:	$2,000
4	Person 2 [keeps her] {*receives*} 20,000 COP if a number smaller than or equal to 40 comes out			Person 2:	$3,000
5	Person 2 [keeps her] {*receives*} 20,000 COP if a number smaller than or equal to 40 comes out			Person 2:	$4,000
6	Person 2 [keeps her] {*receives*} 20,000 COP if a number smaller than or equal to 40 comes out			Person 2:	$5,000
7	Person 2 [keeps her] {*receives*} 20,000 COP if a number smaller than or equal to 40 comes out			Person 2:	$6,000
8	Person 2 [keeps her] {*receives*} 20,000 COP if a number smaller than or equal to 40 comes out			Person 2:	$7,000
9	Person 2 [keeps her] {*receives*} 20,000 COP if a number smaller than or equal to 40 comes out			Person 2:	$8,000
10	Person 2 [keeps her] {*receives*} 20,000 COP if a number smaller than or equal to 40 comes out			Person 2:	$9,000
11	Person 2 [keeps her] {*receives*} 20,000 COP if a number smaller than or equal to 40 comes out			Person 2:	$10,000
12	Person 2 [keeps her] {*receives*} 20,000 COP if a number smaller than or equal to 40 comes out			Person 2:	$11,000
13	Person 2 [keeps her] {*receives*} 20,000 COP if a number smaller than or equal to 40 comes out			Person 2:	$12,000
14	Person 2 [keeps her] {*receives*} 20,000 COP if a number smaller than or equal to 40 comes out			Person 2:	$13,000
15	Person 2 [keeps her] {*receives*} 20,000 COP if a number smaller than or equal to 40 comes out			Person 2:	$14,000
16	Person 2 [keeps her] {*receives*} 20,000 COP if a number smaller than or equal to 40 comes out			Person 2:	$15,000
17	Person 2 [keeps her] {*receives*} 20,000 COP if a number smaller than or equal to 40 comes out			Person 2:	$16,000
18	Person 2 [keeps her] {*receives*} 20,000 COP if a number smaller than or equal to 40 comes out			Person 2:	$17,000
19	Person 2 [keeps her] {*receives*} 20,000 COP if a number smaller than or equal to 40 comes out			Person 2:	$18,000
20	Person 2 [keeps her] {*receives*} 20,000 COP if a number smaller than or equal to 40 comes out			Person 2:	$19,000
21	Person 2 [keeps her] {*receives*} 20,000 COP if a number smaller than or equal to 40 comes out			Person 2:	$20,000

Participant ID #: ________

TASK #12

Consider the list below. In this list:

- **Option A** will be **Person 2** plays a lottery in which she will [get to keep her] {*receive*} 20,000 COP if a number smaller than or equal to **60** (out of 100) comes out

- **Option B** will be **Person 2** receives some peso amount for sure. As you proceed down the rows of the list, the amount Person 2 receives will increase from 0 COP to 20,000 COP.

For each row, you have to decide whether you prefer to keep Option A or switch to Option B.

	Option A	A	B	Option B
1	Person 2 [keeps her] {*receives*} 20,000 COP if a number smaller than or equal to 60 comes out			Person 2: $0
2	Person 2 [keeps her] {*receives*} 20,000 COP if a number smaller than or equal to 60 comes out			Person 2: $1,000
3	Person 2 [keeps her] {*receives*} 20,000 COP if a number smaller than or equal to 60 comes out			Person 2: $2,000
4	Person 2 [keeps her] {*receives*} 20,000 COP if a number smaller than or equal to 60 comes out			Person 2: $3,000
5	Person 2 [keeps her] {*receives*} 20,000 COP if a number smaller than or equal to 60 comes out			Person 2: $4,000
6	Person 2 [keeps her] {*receives*} 20,000 COP if a number smaller than or equal to 60 comes out			Person 2: $5,000
7	Person 2 [keeps her] {*receives*} 20,000 COP if a number smaller than or equal to 60 comes out			Person 2: $6,000
8	Person 2 [keeps her] {*receives*} 20,000 COP if a number smaller than or equal to 60 comes out			Person 2: $7,000
9	Person 2 [keeps her] {*receives*} 20,000 COP if a number smaller than or equal to 60 comes out			Person 2: $8,000
10	Person 2 [keeps her] {*receives*} 20,000 COP if a number smaller than or equal to 60 comes out			Person 2: $9,000
11	Person 2 [keeps her] {*receives*} 20,000 COP if a number smaller than or equal to 60 comes out			Person 2: $10,000
12	Person 2 [keeps her] {*receives*} 20,000 COP if a number smaller than or equal to 60 comes out			Person 2: $11,000
13	Person 2 [keeps her] {*receives*} 20,000 COP if a number smaller than or equal to 60 comes out			Person 2: $12,000
14	Person 2 [keeps her] {*receives*} 20,000 COP if a number smaller than or equal to 60 comes out			Person 2: $13,000
15	Person 2 [keeps her] {*receives*} 20,000 COP if a number smaller than or equal to 60 comes out			Person 2: $14,000
16	Person 2 [keeps her] {*receives*} 20,000 COP if a number smaller than or equal to 60 comes out			Person 2: $15,000
17	Person 2 [keeps her] {*receives*} 20,000 COP if a number smaller than or equal to 60 comes out			Person 2: $16,000
18	Person 2 [keeps her] {*receives*} 20,000 COP if a number smaller than or equal to 60 comes out			Person 2: $17,000
19	Person 2 [keeps her] {*receives*} 20,000 COP if a number smaller than or equal to 60 comes out			Person 2: $18,000
20	Person 2 [keeps her] {*receives*} 20,000 COP if a number smaller than or equal to 60 comes out			Person 2: $19,000
21	Person 2 [keeps her] {*receives*} 20,000 COP if a number smaller than or equal to 60 comes out			Person 2: $20,000

Participant ID #: ________

TASK #13

Consider the list below. In this list:

- **Option A** will be **Person 2** plays a lottery in which she will [get to keep her] {*receive*} 20,000 COP if a number smaller than or equal to **80** (out of 100) comes out

- **Option B** will be **Person 2** receives some peso amount for sure. As you proceed down the rows of the list, the amount Person 2 receives will increase from 0 COP to 20,000 COP.

For each row, you have to decide whether you prefer to keep Option A or switch to Option B.

	Option A	A	B	Option B
1	Person 2 [keeps her] {*receives*} 20,000 COP if a number smaller than or equal to 80 comes out			Person 2: $0
2	Person 2 [keeps her] {*receives*} 20,000 COP if a number smaller than or equal to 80 comes out			Person 2: $1,000
3	Person 2 [keeps her] {*receives*} 20,000 COP if a number smaller than or equal to 80 comes out			Person 2: $2,000
4	Person 2 [keeps her] {*receives*} 20,000 COP if a number smaller than or equal to 80 comes out			Person 2: $3,000
5	Person 2 [keeps her] {*receives*} 20,000 COP if a number smaller than or equal to 80 comes out			Person 2: $4,000
6	Person 2 [keeps her] {*receives*} 20,000 COP if a number smaller than or equal to 80 comes out			Person 2: $5,000
7	Person 2 [keeps her] {*receives*} 20,000 COP if a number smaller than or equal to 80 comes out			Person 2: $6,000
8	Person 2 [keeps her] {*receives*} 20,000 COP if a number smaller than or equal to 80 comes out			Person 2: $7,000
9	Person 2 [keeps her] {*receives*} 20,000 COP if a number smaller than or equal to 80 comes out			Person 2: $8,000
10	Person 2 [keeps her] {*receives*} 20,000 COP if a number smaller than or equal to 80 comes out			Person 2: $9,000
11	Person 2 [keeps her] {*receives*} 20,000 COP if a number smaller than or equal to 80 comes out			Person 2: $10,000
12	Person 2 [keeps her] {*receives*} 20,000 COP if a number smaller than or equal to 80 comes out			Person 2: $11,000
13	Person 2 [keeps her] {*receives*} 20,000 COP if a number smaller than or equal to 80 comes out			Person 2: $12,000
14	Person 2 [keeps her] {*receives*} 20,000 COP if a number smaller than or equal to 80 comes out			Person 2: $13,000
15	Person 2 [keeps her] {*receives*} 20,000 COP if a number smaller than or equal to 80 comes out			Person 2: $14,000
16	Person 2 [keeps her] {*receives*} 20,000 COP if a number smaller than or equal to 80 comes out			Person 2: $15,000
17	Person 2 [keeps her] {*receives*} 20,000 COP if a number smaller than or equal to 80 comes out			Person 2: $16,000
18	Person 2 [keeps her] {*receives*} 20,000 COP if a number smaller than or equal to 80 comes out			Person 2: $17,000
19	Person 2 [keeps her] {*receives*} 20,000 COP if a number smaller than or equal to 80 comes out			Person 2: $18,000
20	Person 2 [keeps her] {*receives*} 20,000 COP if a number smaller than or equal to 80 comes out			Person 2: $19,000
21	Person 2 [keeps her] {*receives*} 20,000 COP if a number smaller than or equal to 80 comes out			Person 2: $20,000

[Participants receive instructions for Tasks #14 - #16 as well as the corresponding block of answer sheets. One of the experimenters then reads the instructions aloud. Group 1 participants complete this block of tasks using both the answer sheets and the computer. They see each of the three price lists on a separate screen. Answer sheets are collected upon completion.]

TASKS #14 - #16

To complete the following three tasks, you will use the computer and the answer sheets we just gave you.

In each task, you will face a list featuring two options:

- **Option A** will be **Person 2** plays a lottery to determine whether she [gets to keep her] {*receives*} 20,000 COP, and **you** receive nothing in addition to your 20,000 COP

- **Option B** will be **Person 2** [loses her 20,000 COP for sure] {*does not receive anything*} and **you** receive some peso amount that will be added to your 20,000 COP

For example, in Task #14 Option A will be **Person 2** plays a lottery in which she [gets to keep her] {*receives*} 20,000 COP if a number smaller than or equal to **40** (out of 100) comes out.

For each row, you have to decide whether you prefer to keep Option A or switch to Option B.

Please raise your hand once you have completed Tasks #14 - #16.

Participant ID #: ________

TASK #14

Consider the list that appears on the screen. In this list:

- **Option A** will be **Person 2** plays a lottery in which she [gets to keep her] {*receives*} 20,000 COP if a number smaller than or equal to **40** (out of 100) comes out, and **you** receive nothing in addition to your 20,000 COP.

- **Option B** will be **Person 2** [loses her 20,000 COP for sure] {*does not receive anything*} and **you** receive some peso amount that will be added to your 20,000 COP.

For each row, you have to decide whether you prefer to keep Option A or switch to Option B.

Please indicate your preference by checking the corresponding option on the table below. Once you are satisfied with all your choices, please copy them in the table that appears on the screen.

	Option A	Option B
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		
21		

Participant ID #: ________

TASK #15

Consider the list that appears on the screen. In this list:

- **Option A** will be **Person 2** plays a lottery in which she [gets to keep her] {*receives*} 20,000 COP if a number smaller than or equal to **60** (out of 100) comes out, and **you** receive nothing in addition to your 20,000 COP.

- **Option B** will be Person 2 [loses her 20,000 COP for sure] {*does not receive anything*} and **you** receive some peso amount that will be added to your 20,000 COP.

For each row, you have to decide whether you prefer to keep Option A or switch to Option B.

Please indicate your preference by checking the corresponding option on the table below. Once you are satisfied with all your choices, please copy them in the table that appears on the screen.

	Option A	Option B
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		
21		

Participant ID #: ________

TASK #16

Consider the list that appears on the screen. In this list:

- **Option A** will be **Person 2** plays a lottery in which she [gets to keep her] {*receives*} 20,000 COP if a number smaller than or equal to **80** (out of 100) comes out, and **you** receive nothing in addition to your 20,000 COP.

- **Option B** will be Person 2 [loses her 20,000 COP for sure] {*does not receive anything*} and **you** receive some peso amount that will be added to your 20,000 COP.

For each row, you have to decide whether you prefer to keep Option A or switch to Option B.

Please indicate your preference by checking the corresponding option on the table below. Once you are satisfied with all your choices, please copy them in the table that appears on the screen.

	Option A	Option B
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		
21		

[Participants receive instructions for Task #17 and one of the experimenters reads the instructions aloud. Answer sheets are collected upon completion.]

TASK #17

In this task, **Person 2 will** [**keep her**] {***receive***} **20,000 COP for sure** and may earn more money. You can also earn additional money. Your decisions will affect both Person 2's additional payment and your own additional payment.

All peso amounts in this task are final payments. This means that payments to you already include your 20,000 COP from the envelope; similarly, payments to Person 2 include her 20,000 COP.

Consider the list below. In this list:

- **Option A** will be **you** receive some peso amount and **Person 2** receives the same peso amount. As you proceed down the rows of the list, the amount both of you receive will decrease from 30,000 COP to 20,000 COP.

- **Option B** will be **you** receive 30,000 COP and **Person 2** receives 20,000 COP.

For each row, you have to decide whether you prefer to keep Option A or switch to Option B.

As an example, consider the decision you face in row 11, which we reproduce next. The initial allocation (i.e., Option A) is 25,000 COP for each person.

- If you keep Option A, then each person receives 25,000 COP.

	Option A				A	B	Option B			
11	You:	**$25,000**	Person 2:	**$25,000**	**X**		You:	**$30,000**	Person 2:	**$20,000**

- If you switch to Option B, then you will receive 30,000 COP instead of 25,000 COP, and Person 2 will receive 20,000 COP instead of 25,000 COP.

	Option A				A	B	Option B			
11	You:	**$25,000**	Person 2:	**$25,000**		**X**	You:	**$30,000**	Person 2:	**$20,000**

One way to complete this list is to determine in which row you want to switch from Option A to Option B. You do not necessarily have to switch; if you want, you can keep Option A in all rows.

Now, please make your decisions.

Please raise your hand once you are done.

Participant ID #: ________

TASK #17

	Option A				A	B	Option B			
1	You:	**$30,000**	Person 2:	**$30,000**			You:	**$30,000**	Person 2:	**$20,000**
2	You:	**$29,500**	Person 2:	**$29,500**			You:	**$30,000**	Person 2:	**$20,000**
3	You:	**$29,000**	Person 2:	**$29,000**			You:	**$30,000**	Person 2:	**$20,000**
4	You:	**$28,500**	Person 2:	**$28,500**			You:	**$30,000**	Person 2:	**$20,000**
5	You:	**$28,000**	Person 2:	**$28,000**			You:	**$30,000**	Person 2:	**$20,000**
6	You:	**$27,500**	Person 2:	**$27,500**			You:	**$30,000**	Person 2:	**$20,000**
7	You:	**$27,000**	Person 2:	**$27,000**			You:	**$30,000**	Person 2:	**$20,000**
8	You:	**$26,500**	Person 2:	**$26,500**			You:	**$30,000**	Person 2:	**$20,000**
9	You:	**$26,000**	Person 2:	**$26,000**			You:	**$30,000**	Person 2:	**$20,000**
10	You:	**$25,500**	Person 2:	**$25,500**			You:	**$30,000**	Person 2:	**$20,000**
11	You:	**$25,000**	Person 2:	**$25,000**			You:	**$30,000**	Person 2:	**$20,000**
12	You:	**$24,500**	Person 2:	**$24,500**			You:	**$30,000**	Person 2:	**$20,000**
13	You:	**$24,000**	Person 2:	**$24,000**			You:	**$30,000**	Person 2:	**$20,000**
14	You:	**$23,500**	Person 2:	**$23,500**			You:	**$30,000**	Person 2:	**$20,000**
15	You:	**$23,000**	Person 2:	**$23,000**			You:	**$30,000**	Person 2:	**$20,000**
16	You:	**$22,500**	Person 2:	**$22,500**			You:	**$30,000**	Person 2:	**$20,000**
17	You:	**$22,000**	Person 2:	**$22,000**			You:	**$30,000**	Person 2:	**$20,000**
18	You:	**$21,500**	Person 2:	**$21,500**			You:	**$30,000**	Person 2:	**$20,000**
19	You:	**$21,000**	Person 2:	**$21,000**			You:	**$30,000**	Person 2:	**$20,000**
20	You:	**$20,500**	Person 2:	**$20,500**			You:	**$30,000**	Person 2:	**$20,000**
21	You:	**$20,000**	Person 2:	**$20,000**			You:	**$30,000**	Person 2:	**$20,000**

[The task-that-counts is selected. Group 1 participants learn their payments from Tasks #1 - #17. One of the experimenters takes the corresponding answer sheets from Group 1 participants to the other room. Using these answer sheets, experimenters in the other room determine payments to Group 2 participants. (Group 1 participants do not learn their partner's payment if it is determined by a lottery.) Before Group 1 participants are paid, they receive the following general instructions for Tasks #18 - #19, and one of the assistants reads the instructions aloud.]

TASKS #18 - #19

Now that we have determined your payment from Tasks #1 - #17, you will complete the last two tasks of the session (Tasks #18 - #19). In these tasks, you will have the opportunity to earn additional money. **The decisions you will make in Tasks #18 - #19 will affect only your own payment**.

Once you have completed both tasks, we will randomly select the task-that-counts by rolling a ten-sided die. If any of the first five numbers comes out, then Task #18 will be selected as the task-that-counts; otherwise, Task #19 will be selected as the task-that-counts.

To select the row-that-counts, we will use the procedure with numbered pieces of paper that we described before.

[Participants receive instructions for Task #18 and one of the experimenters reads the instructions aloud. Answer sheets are collected upon completion.]

Participant ID #: ________

TASK #18

Consider the list below. In this list:

- **Option A** will be you keep your payment from Tasks #1 - #17 (i.e., your current payment) for sure
- **Option B** will be you play a lottery; you will **receive 10,000 COP in addition to your current payment** if a **number between 1 and 50** comes out, or you will **lose part of your current payment** if a **number between 51 and 100** comes out. As you proceed down the rows of the list, the amount you might lose will decrease from 11,000 COP to 0 COP.

For each row, you have to decide whether you prefer to keep Option A or switch to Option B.

Now, please make your decisions. Please raise your hand once you are done.

	Option A	**A**	**B**	**Option B** *Lottery - potential gain is 10,000 COP*	
1	Keep your current payment for sure			Play the lottery when the potential loss is	$11,000
2	Keep your current payment for sure			Play the lottery when the potential loss is	$10,500
3	Keep your current payment for sure			Play the lottery when the potential loss is	$10,000
4	Keep your current payment for sure			Play the lottery when the potential loss is	$9,500
5	Keep your current payment for sure			Play the lottery when the potential loss is	$9,000
6	Keep your current payment for sure			Play the lottery when the potential loss is	$8,500
7	Keep your current payment for sure			Play the lottery when the potential loss is	$8,000
8	Keep your current payment for sure			Play the lottery when the potential loss is	$7,500
9	Keep your current payment for sure			Play the lottery when the potential loss is	$7,000
10	Keep your current payment for sure			Play the lottery when the potential loss is	$6,500
11	Keep your current payment for sure			Play the lottery when the potential loss is	$6,000
12	Keep your current payment for sure			Play the lottery when the potential loss is	$5,500
13	Keep your current payment for sure			Play the lottery when the potential loss is	$5,000
14	Keep your current payment for sure			Play the lottery when the potential loss is	$4,500
15	Keep your current payment for sure			Play the lottery when the potential loss is	$4,000
16	Keep your current payment for sure			Play the lottery when the potential loss is	$3,500
17	Keep your current payment for sure			Play the lottery when the potential loss is	$3,000
18	Keep your current payment for sure			Play the lottery when the potential loss is	$2,500
19	Keep your current payment for sure			Play the lottery when the potential loss is	$2,000
20	Keep your current payment for sure			Play the lottery when the potential loss is	$1,500
21	Keep your current payment for sure			Play the lottery when the potential loss is	$1,000
22	Keep your current payment for sure			Play the lottery when the potential loss is	$500
23	Keep your current payment for sure			Play the lottery when the potential loss is	$0

[Participants receive instructions for Task #19 and one of the experimenters reads the instructions aloud. Answer sheets are collected upon completion.]

Participant ID #: ________

TASK #19

Consider the list below. (Row numbers are displayed next to each row.) In this list:

- **Option A** will be you play a lottery; you will receive **your current payment plus 10,000 COP** if a **number between 1 and 50** comes out; or you will receive **your current payment plus 0 COP** if a **number between 51 and 100** comes out

- **Option B** will be you receive your current payment plus some peso amount for sure. As you proceed down the rows of the list, the additional amount you receive will increase from 0 COP to 10,000 COP.

For each row, you have to decide whether you prefer to keep Option A or switch to Option B.

Now, please make your decisions. Please raise your hand once you are done.

	Option A		A	B	**Option B**
	Current payment plus $10,000 if the number is	*Current payment plus $0 if the number is*			*Sure payment*
1	between 1 and 50	between 51 and 100			Current payment plus $0
2	between 1 and 50	between 51 and 100			Current payment plus $500
3	between 1 and 50	between 51 and 100			Current payment plus $1,000
4	between 1 and 50	between 51 and 100			Current payment plus $1,500
5	between 1 and 50	between 51 and 100			Current payment plus $2,000
6	between 1 and 50	between 51 and 100			Current payment plus $2,500
7	between 1 and 50	between 51 and 100			Current payment plus $3,000
8	between 1 and 50	between 51 and 100			Current payment plus $3,500
9	between 1 and 50	between 51 and 100			Current payment plus $4,000
10	between 1 and 50	between 51 and 100			Current payment plus $4,500
11	between 1 and 50	between 51 and 100			Current payment plus $5,000
12	between 1 and 50	between 51 and 100			Current payment plus $5,500
13	between 1 and 50	between 51 and 100			Current payment plus $6,000
14	between 1 and 50	between 51 and 100			Current payment plus $6,500
15	between 1 and 50	between 51 and 100			Current payment plus $7,000
16	between 1 and 50	between 51 and 100			Current payment plus $7,500
17	between 1 and 50	between 51 and 100			Current payment plus $8,000
18	between 1 and 50	between 51 and 100			Current payment plus $8,500
19	between 1 and 50	between 51 and 100			Current payment plus $9,000
20	between 1 and 50	between 51 and 100			Current payment plus $9,500
21	between 1 and 50	between 51 and 100			Current payment plus $10,000

[Final payments are determined. Next, Group 1 participants complete the following demographic questionnaire. Finally, Group 1 participants are paid and dismissed.]

Participant ID #: _________

PERSONAL INFORMATION

Thanks for completing this session!

Before you leave, we ask you to complete the following questionnaire. Your answers will be kept strictly confidential.

1) Have you participated in other studies at Universidad del Rosario?

Yes _______ No _______

If your answer is Yes, please indicate which departments were conducting the studies.

2) What is your age?

3) What is your gender? M _____ F _____

4) What is your major?

5) How many semesters have you been enrolled at Universidad del Rosario?

6) Where have you lived most of your life?

Country: _______________________ City: _______________________

7) What stratum does your home belong to? Check the corresponding number.

1 2 3 4 5 6