Septiembre 2020

ART6_A1_2020_2
N° de serie

Artículo Científico

How do risk attitudes affect pro-social behavior? Theory and experiment

Autores

Sean Fahle

Santiago Sautua

COLOMBIA CIENTÍFICA
Conocimiento Global para el Desarrollo

ALIANZAEFI
Economía Formal e Inclusiva

Theory and Decision (2021) 91:101–122
https://doi.org/10.1007/s11238-020-09788-8

How do risk attitudes affect pro-social behavior? Theory and experiment

Sean Fahle[1] · Santiago I. Sautua[2]

Accepted: 26 October 2020 / Published online: 17 November 2020

Abstract

We explore how risk preferences affect pro-social behavior under uncertainty. We analyze a modified dictator game in which the dictator can, 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. Consistent with the predictions of the model, we find that the relationship between giving behavior and a giver's loss aversion is mediated by the strength of the giver's pro-social preferences. Among more (less) pro-social dictators, an increase in loss aversion increases (decreases) the likelihood that a dictator contributes to a recipient.

Keywords Other-regarding preferences · Pro-social behavior · Reference-dependent preferences · Risk

We thank Greg Sacks for insightful conversations at the beginning of this project, and an associate editor, two anonymous referees, Ori Heffetz, Ted O'Donoghue, Erkut Ozbay, Guillem Roig, Chad Stecher, and Kyle Woodward for helpful comments and suggestions. We also thank the audiences at the 2017 ESA World Meeting, the Experimental and Behavioral Economics Workshop at Universidad del Rosario, the Bogotá Experimental and Behavioral Economics Seminar (BEBES), Universidad Nacional de Colombia, Universidad de los Andes, and Cornell University for their feedback. Laura Correa provided excellent research assistance. For valuable assistance in the laboratory sessions, we also thank Laura Becerra and Yuliet Verbel. Sautua thanks Universidad del Rosario for financial support. Fahle acknowledges funding from the Alfred P. Sloan Foundation (Grant G-2015-14131).

Electronic Supplementary Material The online version of this article (https://doi.org/10.1007/s11238-020-09788-8) contains supplementary material, which is available to authorized users.

✉ Santiago I. Sautua
santiago.sautua@urosario.edu.co

Sean Fahle
seanfahl@buffalo.edu

Extended author information available on the last page of the article

1 Introduction

Individuals often undertake pro-social behavior even when its effectiveness is uncertain. As an example, consider the situation of a teacher choosing whether to expend time and energy to provide extra after-hours help to a struggling student. On the one hand, by helping the student, the teacher incurs a certain cost in terms of her forgone 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 and include physicians performing risky operations for patients and parents making risky investments in their children. In this paper, we are concerned with how this type of social decision is impacted by the decision-maker's risk preferences.

Very few empirical studies have directly 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. By contrast, the results from two earlier studies (Brennan et al. 2008; Güth et al. 2008) suggest that while players care about their own risks, they do not appear to respond to risks faced by others. Most recently, in settings similar to our own, Freundt and Lange (2017) and Cettolin et al. (2017) both found that a giver's risk preferences do appear to matter for giving behavior.[1]

An important limitation of the existing empirical literature is that it generally explores the relationship between risk attitudes and pro-social behavior outside of the context of any particular model of behavior. As a result, the literature has remained largely silent on the precise mechanism underlying this connection. We seek to address this limitation here.

In this paper, our aim is to build upon these existing results by taking a more model-driven approach. This approach allows us to provide (and experimentally test) a more precise characterization of how a decision-maker's risk preferences interact with her other-regarding preferences to affect her pro-social behavior in risky environments.[2]

Our first contribution is to embed reference-dependent risk attitudes into a standard social preferences model and to derive testable implications for the giving behavior of a dictator in a risky dictator game. In the augmented model, the dictator evaluates both her own sure payoff and the recipient's risky payoff relative to a reference point. Because we consider situations in which the giver knows the risk faced by the recipient but does not know the recipient's risk preferences, our basic premise is that the giver projects her own risk preferences onto the recipient when deciding how much to give. This premise relies on the concept of social projection, which social psychologists have defined as the tendency to expect similarities

[1] Another strand of experiments has investigated whether individual risk preferences predict trusting decisions. Several studies have failed to find a systematic association between the two (see, e.g., Eckel and Wilson (2004) and Houser et al. (2010)).

[2] Our approach is not intended to reconcile the seemingly contradictory findings in the existing literature. That task is outside the scope of this paper. Whereas the results described above emerged from a disparate array of games and settings, we concentrate here on the dictator game and study one specific configuration of this game in detail.

between oneself and others. The use of social projection to make predictions about others has been widely documented, especially in situations in which information about others is limited (Robbins and Krueger 2005; Krueger 2007).

With regard to risk attitudes, we concentrate on the giver's loss aversion. We do so for two reasons. First, the stakes in our experiment are small, and in such settings, the diminishing marginal utility of wealth should not play a role (Rabin 2000; Rabin and Thaler 2001; Kőszegi and Rabin 2007). By contrast, loss aversion has been identified as a key determinant of risk attitudes under small- or modest-scale risk.[3] Second, a sizeable literature has documented the importance of reference-dependent preferences, and loss aversion in particular, for rationalizing experimental anomalies and non-standard behavior across a variety of domains.[4]

To date, Cettolin et al. (2017) have provided the only formal model incorporating both social preferences and risk preferences.[5] As the authors themselves have acknowledged, their approach has two important limitations. First, they develop the model after conducting their laboratory experiments in an attempt to explain the observed link between risk attitudes and giving behavior. Hence, by design, their experiments do not provide a sharp test of their model. Second, although the model is primarily intended to explain behavior under small-scale risk, it retains classical expected utility assumptions, which imply risk neutrality in such a setting. By contrast, we allow for reference-dependent risk preferences, so our model is well-suited to making predictions in situations with small- or modest-scale risk.

Illustrating the value of taking a model-oriented approach, we find that our model makes a distinctive prediction about the link between social preferences and loss aversion in our setting. For dictators who perceive giving as a loss, giving entails a trade-off between their own losses and the recipient's potential losses. In these cases, our model implies that the net effect of loss aversion on giving behavior is mediated by the strength of the dictator's social preferences. Dictators with weak social preferences will weigh their own losses more heavily than the recipient's potential losses. For these dictators, therefore, the probability of giving will be decreasing in their degree of loss aversion. By contrast, among dictators with strong social preferences, those who are more loss averse will be more likely to give. As we show in Sect. 5, this nuanced relationship between social preferences and risk preferences may not hold in settings with large-scale risk, where the diminishing marginal utility of wealth is the main driver of risk aversion. There, we provide an example in which, when the stakes are large, a more risk-averse dictator will generally give more than a less risk-averse dictator.[6]

[3] In our empirical analysis, we also make a limited attempt to account for the role of non-linear probability weighting, another important component of risk attitudes.

[4] For an excellent summary of recent work, see Sprenger (2015).

[5] Saito (2013) extended Fehr and Schmidt's (1999) inequality aversion model to investigate the trade-off between equality of opportunity and equality of outcome when outcomes are risky. His model, however, assumes risk neutrality.

[6] Our focus on the interaction between social preferences and risk attitudes also differentiates our work from that of Fornasari et al. (2020), who study risky choices with social spillovers with an emphasis on decision-making on behalf of others. Although the authors, like us, take a model-driven approach, they neglect considerations about risk attitudes and focus exclusively on the role of social preferences.

A strength of our approach is its generality. The theoretical results we derive for situations with small- or modest-scale risk are robust across numerous different motives for giving, such as 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 ego-centric altruism (Cox et al. 2007). In addition, the predictions hold regardless of whether decision-makers evaluate utilities ex-ante, ex-post, or both.

Our second contribution is to test the predictions of the augmented social preferences model 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 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 et al. 2008; Güth et al. 2008). In contrast to other recent studies that have analyzed similar risky dictator games (Krawczyk and Le Lec 2010; Brock et al. 2013; Freundt and Lange 2017; Cettolin et al. 2017), we focus on situations in which behavior is largely unaffected by the giver's precise motive for giving.

To test our augmented social preferences model, we combine the data from the dictator game tasks with data from an additional suite of tasks that elicit measures of loss aversion and other-regarding preferences. We then compare giving behavior across dictators who exhibit varying degrees of loss aversion, controlling for individual differences in the strength of social preferences.

We find results broadly supportive of our augmented social preferences model. Most significantly, and consistent with the predictions of the model, we find that the effect of a dictator's loss aversion on her giving behavior is mediated by the strength of her social preferences. While loss aversion reduces the probability of giving for less pro-social dictators, among more pro-social dictators, we observe that those who are more loss averse are more likely to give.

The rest of the paper proceeds as follows. Section 2 presents our social preferences model augmented with reference-dependent risk preferences. Section 3 describes our experimental design. Section 4 discusses the experimental results and assesses their robustness. In Sect. 5, we broaden the scope of our analysis beyond reference-dependent risk preferences and consider how our model can be extended to settings with large-scale risk, in which another dimension of risk aversion, the curvature of the utility function over wealth, plays a key role. Section 6 concludes.

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 et al. (2013) (see their Tasks 2 and 3, p. 422). The dictator is endowed with 20,000 Colombian pesos (COP) (equivalent to about 7