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ORIGINAL PAPER

Taking games: a meta-analysis

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Abstract

This paper presents the first meta-analysis of the 'Taking Game,' a variant of the Dictator Game where participants take money from recipients instead of giving. Upon analyzing data from 39 experiments, which include 123 effect sizes and 7262 offers made by dictators, we discovered a significant framing effect: dictators are more generous in the Taking Game than in the Dictator Game (Cohen's $d = 0.26$, $p < 0.0001$), leaving approximately 35.5 percent of the stakes to recipients in the former as opposed to 27.5 percent in the latter. The difference is higher when the participants have earned their endowment before sharing or when the recipient is a charity. Consistent with the standard literature on giving, we also find that participants take less from a charity than from a standard recipient, take less when payoffs are hypothetical, or when recipients have previously earned their endowment. We also find that women (non-students) take less than men (students). Finally, it appears that participants from non-OECD countries leave more money to recipients than participants from OECD countries.

Keywords Taking Game · Dictator Game · Framing effects · Meta-analysis · Multiple regression

JEL Classification C13 · C91 · D03 · D64

1 Introduction

The Taking Game (TG), also known as the 'gangster game', is a variant of the Dictator Game (DG), a traditional game used in experimental economics to measure generosity or altruism. In the DG, a first player (the dictator) has an endowment (e.g., 10 USD) that they can choose to share or not with a second player, the

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receiver. The receiver is passive and powerless, merely a recipient of whatever the dictator leaves. Therefore, the rational prediction for a self-interested dictator is to keep the whole endowment. Conversely, in the TG, the receiver starts with the endowment, and the dictator can decide whether or not to take it. The rational prediction for a self-interested dictator in this case is to take the entire endowment from the receiver. Therefore, the outcomes of these two games should be the same: the dictator leaves nothing for the receiver.

However, empirical literature has shown that a large proportion of players are influenced by other-regarding preferences, such as altruism or fairness, and, therefore, their actions often deviate from the theory. In the context of the DG, Engel's (2011) meta-analysis reported that 64% of dictators choose to give something, with the average offering amounting to 28.3% of the endowment. Consequently, the TG is primarily used to study the potential influence of a 'framing' effect on this level of generosity. It aims to investigate whether the act of taking is perceived differently from the act of not giving, specifically within the context of charitable donations.

Indeed, while the taking frame is not commonly present in the majority of charitable situations, there are real-life instances where it does play a significant role. These include, among others, opt-out systems for organ donations; workplace giving programs, where some employers offer a scheme for a portion of an employee's pay to be automatically donated to a charitable organization (employees typically have the option to opt out); memberships and subscriptions to organizations or services that include a charitable donation; charitable contributions included in event ticket prices (which attendees can choose to opt out of); and even automatic round-up programs. Beyond charitable donations, this type of framing is often utilized in other areas, such as retirement contributions, insurance coverage, and subscription services. Thus, discerning the actual impact of this framing is of crucial importance.

Due to the "do-no-harm" principle (Baron, 1995) concerning property rights over the endowment, and the supposed higher moral cost of "taking" than not giving—known as "taking aversion" (see Korenok et al., 2018 for evidence)—the TG is believed to promote more pro-social behavior and generosity toward recipients than the DG. However, although empirical literature indicates that dictators in the TG refrain from taking everything from the receiver (Dreber et al., 2013; Jakiela, 2015), it remains unclear whether this variant of the game indeed yields a different level of generosity compared to behavior in the DG. Indeed, some studies found that individuals act more generously in the TG (leaving greater amounts to the recipient) compared to the DG (the control group), while others found no significant effects or even contrary results. The lack of empirical evidence on preferences for altruism in a taking context is widely discussed in the literature on the subject (e.g., Korenok et al., 2018, Dreber et al., 2013).

All these studies have their own protocols and ways of reporting results, with different sample sizes and populations tested, which could partly explain the discrepancies in outcomes. Furthermore, most results are not statistically significant, which could be due to a lack of power if the true potential effect is small. Lastly, it is possible that this literature may be influenced by publication bias or p-hacking. Therefore, it would be relevant to use the meta-analysis method to clarify the evidence.

Indeed, meta-analysis method allows researchers to combine and compare the results of different studies, even if they have different sample sizes or use different methods, which provide a more accurate picture of the overall pattern of findings on a particular topic. Moreover, it helps to identify and explore sources of heterogeneity between studies, which can help researchers understand the factors that might be driving the observed differences in results. This can be particularly useful when studying complex and nuanced topics, such as social preferences and fairness, which may be influenced by a wide range of factors. Finally, meta-analysis method has the main advantage of increasing the statistical power of the analysis by combining the sample sizes of multiple studies. This improves the ability to detect small but meaningful effects and reduces the risk of false negative findings (Stanley & Doucouliagos, 2012). Note that meta-analysis is particularly useful when studying laboratory experiments because they are designed to be standardized and controlled (Engel, 2011).

This method has been extensively used in recent years to examine player behavior within the giving context in the DG. Engel's pioneering and highly recognized meta-analysis in 2011 is a notable example, delving into the influence of diverse experimental conditions on the proportion of shared endowment in the DG. More recently, meta-analyses have primarily focused on the effects of single or a limited number of variables on altruistic behavior, allowing for greater control and power over these subjects. These variables span a range of domains, such as the magnitude of the stake (as examined by Larney et al., 2019), cognitive ability (explored by Fromell et al., 2020), participant gender (studied by Bilén et al., 2021, and Doñate-Buendía et al., 2022), the nature of incentives, property rights or feelings of ownership, types of recipients (as investigated by Umer et al., 2022, and Umer, 2023), and even the degree of a country's economic development (as per Cochard et al., 2021).

Overall, meta-analyses play an important role in research by improving the reliability and validity of research findings, identifying trends and patterns, informing policy and practice, and guiding future research. However, to the best of our knowledge, there is no meta-analysis of the TG, the symmetrical version of the DG in which players take from the recipients.[1] Our contribution aims to fill this gap and addresses the following main questions: Do participants exhibit greater generosity in DG or in the TG? If there is a difference, what could be driving it?

This paper presents the results of a meta-analysis of 39 studies, drawn from 34 TG papers, comprising 123 estimates and representing a total of 7262 observations. In addition to providing an overview of all TG studies to our knowledge, we employ multivariate regression analysis to identify the variables influencing the framing

[1] It is worth noting that Fromell et al., (2020) did examine the framing effect of "taking" rather than "not giving" in their meta-analysis, though it was treated as a control variable rather than the primary variable of interest. Moreover, their analysis was based on only two papers (Banker et al., 2017 and Hauge et al., 2016), corresponding to 8 estimates, and within a somewhat unique context where participants were depleted while playing. Similarly, Umer et al., (2022) also investigated this dimension in their meta-analysis, though they used just 5 estimates. Neither study found a significant effect of the take-frame, which could be attributed to limited statistical power. As we demonstrate below, the effect size is relatively small and necessitates a larger sample in order to be reliably detected.

effect. Note that the TG should not be confused with the DG with a "take-option," as described in well-known papers by List (2007) and Bardsley (2008). In this DG variant, the dictator has the usual option to give (e.g., 10 USD), but can also choose to take a small portion (e.g., 3 USD, sometimes deducted from the participation fee) from the recipient. While this 'take-option' expands the dictators' range of choices, theoretically it should not alter their altruistic preferences (List, 2007). Nevertheless, meta-analyses by Zhang and Ortmann (2014) and Engel (2011) have investigated the effect of the introduction of this option in DG, and show, as in List's, (2007) study, that it actually reduces overall giving by the dictator. These studies do not change the framing, the way information or choices are presented, but rather the set of possible choices in the standard DG. As our study specifically focuses on the role of framing, we do not consider DG with "take-option" experiments.

The remainder of this paper unfolds as follows. In Sect. 2, we introduce the theoretical framework and formulate our primary hypothesis. Section 3 offers an overview of the existing literature pertaining to the TG. Section 4 details the methodology employed for the meta-analysis. The findings from our analysis are presented in Sect. 5. Finally, in the last section, we discuss the implications of our results and draw our conclusions.

2 Theoretical elements and hypotheses

Several theoretical elements could explain a difference in outcomes between the TG and the DG. According to prospect theory (Kahneman & Tversky, 1979), losses outweigh gains. The decrease in expected utility from a loss exceeds the increase in expected utility from a gain of the same magnitude. Thus, a dictator in the DG, with the size of the endowment as the reference point,[2] would experience greater marginal disutility from each unit not allocated to themselves than a dictator in the TG (where the reference point is zero). In fact, any money given in the DG could be considered a loss (while in the TG, each unit not allocated to oneself can only be considered a missed gain). Several explanations, based on selfishness or ethical concerns, have been proposed in psychological studies (see for example Poppe & Valkenberg, 2003; Grolleau et al., 2016; Losecaat Vermeer et al., 2020). Therefore, due to loss aversion, we can expect dictators to be less generous in DG frameworks than in TG, especially if the endowment is truly perceived as belonging to the player (for instance, if the endowment is earned).

On the other hand, the extensive literature on other-regarding preferences also suggests that the dictator should exhibit greater generosity in the TG than in the DG. Levitt and List (2007) propose a model that considers the moral costs associated

[2] Indeed, it is important to note that in studies examining the framing effect, the dictator in the DG (the control group) 'possesses' the endowment and can choose whether or not to share it. This contrasts with the more conventional scenario where the allocation in the giving context is handled in a more neutral way, in which the dictator does not 'own' the endowment (e.g., 'an endowment of 10 euros has to be shared').

with an action and how changes in the institutional setting can influence a decision-maker's utility. In their model, an individual's utility is impacted through two channels—the first involves the effect on their wealth, while the second encompasses the non-monetary moral cost or benefit associated with the action. This moral cost may hinge on various game aspects, such as the payoffs for the recipient and the dictator, property rights over the endowment, power imbalance, size of the endowment, and also the framing of the decision (i.e., giving or taking). Within this theoretical framework, if the moral cost of taking is equal to the moral cost of not giving, and if the wealth in both the DG and the TG is the same, then the dictator's behavior should remain consistent across both scenarios. However, if the moral cost of taking surpasses that of not giving, the dictator should show more generosity in the TG, and vice versa (Korenok et al., 2018). A substantial body of research suggests that the moral cost associated with taking exceeds the moral cost of not giving. Krupka and Weber (2013) propose that societal norms differentiate between 'taking' and 'giving' actions, even when the resultant payoffs remain constant, rendering 'taking' actions less socially acceptable. List (2007) explores the idea of a "moral cost" related to 'taking' decisions. This moral cost could arise from an individual's desire to maintain a positive self-image, even when not observed by others. This idea aligns with the widely recognized "do-no-harm" principle (Baron, 1995; Royzman & Baron, 2002; Van Beest et al., 2003, 2005), positing that people are typically more reluctant to profit if it involves harming another, especially when the latter has no control over their outcomes (Blau, 1964; Emerson, 1962; Greenberg, 1978; Van Dijk & Vermunt, 2000). According to this principle, subjects are expected to hesitate in taking away money that is perceived as belonging to the recipient.

Korenok et al. (2018) formally demonstrated the existence of a 'taking aversion' through an experiment. In this study, a large majority of dictators chose to participate in a giving game over a taking game when the potential payoffs were identical. Furthermore, they were willing to sacrifice a substantial portion of their endowment to avoid taking actions.

Finally, potential differences between the two framings could also be due to the distinct default options each game presents. Research shows that individuals often prefer the status quo, or default option, due to cognitive biases like inertia (Samuelson & Zeckhauser, 1988). In the DG, the default option could be for the dictator to keep the entire endowment, as they start with full possession. In contrast, the TG begins with the recipient holding the endowment. The dictator must make an active choice to take some of it away, which deviates from the default option. This active decision might be perceived as more difficult or uncomfortable, as it involves a deliberate move away from the status quo (Thaler & Sunstein, 2008).[3] As a result, individuals in the dictator role might be less inclined to 'take from' in the TG

[3] However, it is worth noting that the preference for the default option tends to be most prominent when deviating from it involves cognitive effort, a perceived risk of loss, and uncertainty about the outcomes of alternative choices. Given that these conditions are not really present in our context, we remain cautious about its true impact here.

compared to 'not give to' in the DG. These considerations lead to the same primary prediction: dictators leave significantly more to recipients in the TG than in the DG.

3 Literature overview

Since the introduction of the "gangster game" by Eichenberger and Oberholzer-Gee (1998), a substantial body of experimental economics literature has emerged, exploring scenarios where players 'take' rather than 'give' in the DG. This research includes over 40 studies spanning 16 countries. In the majority of these studies, the authors compare behavior in the TG—where the endowment initially belongs to the recipient and the dictator can take from it—to behavior in the DG, a control game where the dictator possesses the endowment and can decide how much to share with the recipient. Thus, these studies vary the reference point between the two treatments while keeping the potential gains for the players constant.[4]

As previously mentioned, the evidence found in these studies is mixed. For instance, Dreber et al. (2013), Grossman and Eckel (2015), as well as Kettner and Ceccato (2014) performed multiple experiments but did not find any notable discrepancies in the final outcomes. Studies by Korenok et al. (2014), Oxoby and Spraggon (2008), Cox et al. (2016), Visser & Roelofs, (2011), Jakiela, (2013), among others, discovered that the recipient tends to gain more in the TG. Conversely, the studies by Eichenberger and Oberholzer-Gee (1998), Keysar et al. (2008), and Cox et al. (2017) showed that the recipient earns less in the TG. Finally, research by Chowdhury et al. (2017) and Alt et al. (2018) found evidence that supports both viewpoints.

Experiments in this area often exhibit specific characteristics. For instance, Grossman & Eckel's (2015) study utilized a legitimate charity as the recipient, and challenged the dictator to make a final allocation decision after starting from an initial allocation that assigned $20 either to the dictator or to the charity. Similar procedures were adopted by Clot et al., (2018a, 2018b), as well as by Keser and Späth (2021). Dreber et al. (2013) conducted experiments both in a physical lab and online via Amazon's Mechanical Turk. In the study by Kettner and Ceccato (2014), no significant framing effects were noted when they took into account the gender of the dictator and recipient, and publicly disclosed these genders. Korenok et al. (2014) and Bardsley (2008, third experiment), among others, utilized a within-sample design to compare dictator decisions in both settings. Chowdhury et al. (2017) reported notably higher payoffs to the recipient in the taking game when the dictator was female, with smaller, statistically insignificant payoffs when the dictator was male, essentially nullifying any significant difference in the combined population. Alt et al. (2018) found participants to be slightly more generous when they could give to rather than take

[4] Note that in rare cases authors have instead done the opposite to compare the two games, they have kept the reference point fixed (same endowment in TG and DG), while varying the potential gains for the players. The difference between these two ways of proceeding is studied in the meta regression (see below).

from the recipient in a standard protocol, provided there was no group identity. However, when participants were matched with in-group members, this result was reversed and highly significant. Due to the variety of methodologies, it is challenging to clarify the evidence merely by reviewing the literature.

Alternatively, some authors have primarily concentrated on behavior in the TG, without drawing comparisons to the DG, as they consider it to be a distinct game since it may not necessarily appeal to the same preferences. Their primary goal is to comprehend the factors that influence the act of taking and to explore whether the allocation appeals to other socially-oriented preferences or those of varying intensity. For instance, Chowdhury et al. (2014) evaluated the influence of the presence or absence of an "eye image" (a pair of eyes) on altruistic behavior but found no significant differences based on this factor. Halladay and Landsman (2020), along with Greig (2010), examined gender differences in a TG, specifically looking into the role of emotion and the social implications of asserting value. They discovered significant variations in behavior related to gender. Lastly, Clot et al., (2018a) studied whether previous good deeds can justify antisocial behavior in Madagascar. Their experiment demonstrated that participants who had earned moral credits were more likely to appropriate resources compared to the control group. The manner in which moral credits were earned also impacted behavior.

The literature on TG studies is predominantly centered in North America, particularly in the USA. Table 1 offers a comprehensive overview of all known TG studies. Each study is annotated with its publication details (refer to the later discussion on publication bias), the country where the experiment took place (presented in chronological order), the number of participants, and whether behaviors were compared to a DG as a control group. If such a comparison was made, the results are also provided.

We can already observe that a larger number of studies (14 in total) report results in favor of more pro-social behavior in the TG than in the DG, as compared to the opposite (3 studies in total), aligning with theoretical expectations. However, it is also noteworthy that several articles (16 in total) report a non-significant framing effect. As we will discuss later, this often results from a lack of statistical power. Indeed, many studies demonstrate a trend toward the expected result, but the actual effect size, as identified in the meta-analysis, is not substantial and may necessitate a large sample for detection. This situation underscores the utility of a meta-analysis, which, by aggregating results from all these studies, becomes particularly insightful. We will delve into the details of the employed methodology in the following section.

4 Method

We followed the methodology outlined in Stanley and Doucouliagos' (2012) book, 'Meta-regression Analysis in Economics and Business,' to carry out this study. It should be noted that this meta-analysis was not pre-registered.

Table 1 Overview of all taking games

Country	Study	Published	N	Effect
USA	Suvoy (2003)	Unpublished	103	N.S
	Swope et al. (2008)	S.Eco.J	31	N.S
	Keysar et al. (2008)	Psy.Science	101	Sign. −
	Kench & Niman (2010)	E.Eco.J	71	Sign. +
	Dreber et al. (2013)	Exp. Eco	479	N.S
	Visser & Roelofs (2011)	Exp. Eco	106	Sign. +
	Jakiela (2013)	Exp. Eco	144	Sign. +
	Korenok et al. (2014)	Exp. Eco	106	Sign. +
	Smith (2014)	JBEE	32	N.S
	Jakiela, (2015)	JEBO	106	N.S
	Cox et al., (2016)	Unpublished	101	Sign. +
	Banker et al., (2017)	JBDM	430	NA
	Korenok et al., (2017)	J.Econ.Psy	73	Sign. +
	Zhao et al., (2018)	Games	125	N.S
	Korenok et al., (2018)	JEBO	121	Sign. +
	Chang et al., (2019)	G.&Econ.B	237	N.S
	Halladay & Landsman (2020)	Unpublished	55	NA
	Capraro & Vanzo (2019)	Jg.Dec.Mak	284	Sign. +
Germany	Schildberg-H &Strassmair (2012)	J.Law.Eco.O	76	NA
	Heinrich & Weimann (2013)	Econ.Letters	44	NA
	Kettner & Ceccato (2014)	Unpublished	98	N.S
	Kettner & Waichman (2016)	J.Econ.Psy	227	N.S
	Goerg et al. (2020)	J.Eco.S.Asso	48	N.S
	Keser & Späth (2021)	Unpublished	120	Sign. +
England	Bardsley (2008)	Exp. Eco	29	N.S
	Chowdhury et al. (2014)	Unpublished	80	NA
	Chowdhury et al. (2017)	S.Eco.J	70	N.S
Australia	Grossman & Eckel (2015)	Econ.Letters	30	N.S
	Zhao et al. (2018b)	Unpublished	92	Sign. +
Bangladesh	Leibbrandt et al., (2015)	JEBO	45	Sign. +
Madagascar	Clot et al., (2018a)	App.Econ	159	NA
Canada	Oxoby & Spraggon (2008)	JEBO	83	Sign. +
France	Clot et al. (2018b)	Unpublished	78	N.S
Switzerland	Eichenberger & Ober.-Gee (1998)	Pub.Choice	8	Sign. −
Norway	Hauge et al., (2016)	Exp. Eco	96	N.S
N. Zealand	Cox et al., (2017)	Exp. Eco	105	Sign. −
Brazil	Greig (2010)	JEBO	36	NA
Congo	Lowes & Montero (2021)	QJE	482	NA
Kenya	Jakiela (2015)	JEBO	270	Sign. +
Philippines	Molina et al. (2021)	Unpublished	32	Sign. +
Indonesia	Alt et al. (2018)	Games	165	N.S

The caption for the Effect column is as follows: NA indicates a study which did not compare the results of his TG with a control group (DG). N.S indicates a non-significant framing effect, Sign. + indicates a positive effect of framing on generosity while Sign.—indicates a negative effect of framing on generosity

4.1 Inclusion criteria and data

We utilized Google Scholar, Econlit, and Elsevier's ScienceDirect for data collection, using the following keywords: "take-frame dictator game", "taking game," "give-take dictator game," and "gangster game". In the meta-analysis, we included data from articles that implemented a standard TG (as defined in the introduction) as well as data from their control groups in a giving context (when available), excluding any additional treatments that might introduce unnecessary noise into the final results (i.e., effects that cannot be reliably controlled). Consequently, we excluded:

- Experimental studies related to this literature but utilizing different games, such as the DG with a "take-option" (e.g., List, 2007; Bardsley, 2008; Krupka & Weber, 2013; Cappelen et al., 2013, see meta-analyses by Zhang & Ortmann, 2014; and Engel, 2011). Note that some papers, like Bardsley (2008) and Kench and Niman (2010), examine behavior in both a TG (which we do include in the meta-analysis) and a DG with a take-option.
- Non-standard TG studies, such as those conducted by Keysar et al. (2008) and Cox et al. (2017). These studies, while examining behavior in a TG, do so within a context of reciprocity and potential punishment between participants. These conditions dramatically deviate from the standard context of a powerful dictator and a powerless recipient, with no interaction between them. We also excluded data from Capraro & Vanzo (2019), which investigated an "extreme" DG/TG where players only have the choice to either give/take everything or give/take nothing—a condition termed "binary choices".
- TG studies with treatments that could potentially introduce noise, obscuring the true effect. For example, we excluded the study by Korenok et al. (2018), in which players chose the game (TG or DG) before playing. Being the main focus of the experiment, this could easily introduce a selection bias into the final allocations.

In short, we considered all the studies presented in the literature overview (Table 1), with the exception of Korenok et al., (2018), Keysar et al., (2008), Cox et al., 2017) and Capraro & Vanzo (2019). For information purposes and for a possible replication of the study, we indicate in detail which part of the others papers has been considered in the meta-analysis (see Table 1.1 in online appendix). Data were collected from 39 separate studies conducted in 15 countries. It represents a total of 123 effect sizes and 7262 offers made by dictators in TG (and their control group DG). The effect sizes correspond to the mean offers made by dictators. While most studies reported the standard deviations for these estimates, some did not. However, for those that omitted this information, we can, as Engel (2011) illustrates, reconstruct the standard deviation using information about the distribution of offers. Such information is typically depicted graphically, often in the form of a histogram or cumulative distribution.

4.2 Consideration for publication bias

It should be noted that studies reporting significant results are more likely to garner attention and get published than studies reporting non-significant results. This may introduce a bias if analysts exclusively examine the most widely reported studies on the topic. For this reason, our study includes both published and unpublished papers. However, as illustrated in Table 1, the majority of papers considered are published. Of course, a greater number of published papers in the field does not necessarily indicate publication bias; it could simply be a reflection of high scientific interest in the subject. Moreover, we observe that a significant number of published studies reported non-significant results (and are highly cited articles). Nevertheless, the absence of such bias must still be verified. Lastly, despite including all known studies (published or not), the potential for a 'file-drawer effect' (Rosenthal, 1979) still remains.

Such biases can be statistically evaluated in various ways. Since its introduction in 2014 (Simonsohn et al., 2014), the p-curve has become a popular tool to assess publication bias and the accuracy of findings across many scientific disciplines. The p-curve provides a way to verify the integrity of research findings by examining the distribution of significant p-values across a set of studies. In an ideal p-curve not affected by publication bias or p-hacking, we would expect to see a higher proportion of very low p-values (e.g., $p<0.01$) compared to higher ones (e.g., $p=0.04$). This results in a distribution that appears 'right-skewed'.[5] Conversely, a 'left-skewed' p-curve (where a disproportionate number of values are close to the 0.05 significance threshold, often targeted to substantially increase chances of publication) or a U-shaped p-curve may strongly suggest the presence of p-hacking.

The "funnel plot", a graph in the shape of an upturned funnel, is also commonly used to assess the presence of publication bias. Such graphs plot the study precision (or sample size) on the y-axis against the effect size on the x-axis. If the dots are not evenly distributed around the true value found and fail to form an image of an inverted funnel, then there are missing publications. Where significant publication bias is observed it may be corrected by the "trim and fill" method (Duval & Tweedie, 2000). The missing studies as seen in the mirror image are assumed to yield results that are the exact opposites of those found in the studies reported. In this paper, we used a "p-curve" and a "funnel plot" to assess the robustness of the relations we found.

Finally, certain meta-analysis approaches outperform others in managing potential publication bias. This will be discussed in the ensuing subsection.

4.3 Meta-analysis approach

Like Engel (2011) and other meta-analyses on the giving context, we use the traditional approach of pooling effect sizes in a random-effect model (DerSimonian &

[5] A right-skewed distribution means that the tail of the distribution extends more to the right on the x-axis, with the majority of values clustering to the left toward lower values.

Laird, 1986), as it is reasonably assumed that the true effect is not the same across all studies (due to between-studies heterogeneity). This is the standard method for carrying out a meta-analysis of summary statistics, based on estimates (with mean and standard deviation). As stated by Engel (2011), 'normally, meta-analysis cannot go any further.' However, Engel (2011), among others, included such a large number of papers in his meta-analysis that he could collect enough raw data (or reconstruct it from the reported distribution) to conduct a meaningful meta-analysis on 'individual' or 'original' data. This approach, however, significantly reduced his sample size. He used this second data set for complementary analysis. As we are specifically focused on the TG, a variation of the DG game that is less well known, we naturally have less data, and not enough authors have reported the distribution or provided raw data, which prevents us from conducting a second analysis on individual-level data. As Engel (2011) mentioned, "along with the analysis based on individual data, classical meta-analysis is always reported since it is more conservative, and since it can cover more papers". Moreover, as noted by Burke et al. (2017), these methods generally produce similar results and differences primarily occur when researchers use different modeling assumptions.

The model used is, therefore, the following:

$$y_i = x_i'\beta + \mu + e_i,$$

where y_i is the outcome—the mean share taken by participants or the standardized mean differences (SMD) between the mean share given in DG and the mean share left in TG—of experiment (a subgroup of a study) i. SMD, also known as "Cohen's d", is widely used in meta-analysis and represents the difference in mean outcome between treated and control groups over the standard deviation of outcome among participants. Thus, it expresses the size of the treatment effect (relative to the control group) in each study relative to the variability observed in that study. Using the difference between the control group and the experimental group as the response variable makes it possible to control for intra-study unobserved variables. $x_i'\beta$ is a vector of explanatory variables and its associated coefficient vector, $\mu \sim N(0,\tau^2)$ is the between-studies error, with variance τ^2 and $e_i \sim N(0,\sigma_i^2)$ is the within study (residual) error. Each study is, therefore, weighted with $1/(\sigma_i^2 + \tau^2)$ (Harbord & Higgins, 2008). The between-study variance τ^2 represents the variability in true effects across studies.

The estimation could be performed using alternative methods. In a fixed-effects model $y_i = x_i'\beta + e_i$, the weight assigned to each study is simply the inverse of the variance of the study's effect size estimate, denoted as $1/\sigma_i^2$. This approach assumes that all studies in the meta-analysis are estimating the same true effect. Care is required when interpreting the results because of potential unobserved differences in protocols and in the population under test. While it allows for within-subgroup variability, this type of estimator ignores between-subgroup variation. This means that parameter estimates are biased where between-subgroup variation cannot be ignored, which is the case in our study. We do not use this model which may be better suited to medical studies. The random effects (RE) estimator allows the real

variables of interest to vary from one experiment to the other but this method may be sensitive to possible publication bias (Stanley & Doucouliagos, 2012).

Lastly, Stanley and Doucouliagos (2015, 2017), in their unrestricted weighted least squares model propose estimating the same model $y_i = x_i'\beta + e_i$ using weighted least squares (WLS) with $1/\mathrm{se}^2(\mathrm{y_j})$ (where se is the standard error of the dependent variable) as the weights. In instances where publication selection bias occurs, WLS estimates have proven to be more appropriate than random effects estimates. For the purpose of robustness checks, we have also employed the WLS model in this meta-analysis/regression.

5 Meta-analysis results

We begin with a brief discussion of the pie division in the TG. The overarching results are as follows: dictators take approximately 65% of the receiver's pie (64.28% to be precise; [95%-CI: 67.68; 60.87]; N = 69, RE model). However, there is some variation depending on the type of participants and the procedure used. Indeed, we found that participants tend to take less when the receiver is a charity rather than a standard recipient, when the payoffs are hypothetical, or when receivers have previously earned their endowment. Interestingly, non-students take less than students, and the larger the share of women participating in the experiment, the less is the share taken from the recipients. Finally, it also seems that participants from non-OECD countries left more money to recipients than participants from OECD countries (see the entire process, discussion and results in Table 3 and 3.1 in Online appendix). These findings align with those of Engel's (2011) meta-analysis study, as well as other recent meta-analyses in the giving context (Umer et al., 2022; Cochard et al., 2021, Bilèn et al., 2021). Clearly, the variables that influence generosity in the TG are similar to those in the DG, which is not surprising and was somewhat expected given the similarities between the two games. This bolsters the findings of prior meta-analyses and enhances the credibility of our dataset's potential for generalization.

What most interests us is the following observation: by taking around 65% of the pie in the TG, dictators still leave a 35.5% donation [95%-CI: 32.31; 39.12] (N = 69, RE model) to the receivers, which is more generous than the donations observed in the DG (28.3%, RE model, as per Engel's, 2011 meta-analysis). However, there may be substantial mean differences between the samples. To draw more accurate conclusions, it is rather more relevant to consider the control group (DG) from these studies. As explained previously, a large majority of these studies (54 out of 69 estimates) have compared generosity in the TG with that in the DG, allowing the investigation of the framing effect by controlling for both observable and unobservable variables. Using 108 estimators, this yields 54 SMDs. Figure 1, a forest plot, presents these overall results.

The left-hand column lists the names of the authors. The right-hand side of the forest plot indicates the standardized mean differences between control and treatment groups in each study and their 95% confidence interval. The calculation for the

effect sizes involves subtracting the average offers in the control group (DG) from the average offers in the treatment group (TG), and then dividing the result by the pooled standard deviation. Consequently, positive values (or negative, respectively) represent situations in which dictators give more (less) in TG than in DG. Offers are calculated in "equivalent donations" in the TG: taking 60% of the recipient's endowment is considered equivalent to giving 40%. The weight given to each result is represented by the size of the boxes. The dotted vertical line (y-axis) indicates a situation where there is no difference between DG and TG. The diamond indicates the global effect size.

We observe that d equals 0.26, indicating a small to medium positive effect of framing on offers (p-value < 0.0001). Consistent with prospect theory and/or taking aversion, players leave significantly more to recipients in the TG than in the DG. More precisely, dictators give 27.5% [95%-CI 24.31; 30.65] of the endowment in the DG (control group; N = 54), whereas in the TG, dictators take 64.5%, therefore leaving 35.5% [95%-CI 31.76; 39.36] to the recipient (treatment group; $N = 54$). Presenting the game in a taking context has a positive impact on offers. Importantly, the results found in our control group (DG) closely align with those of Engel (2011) at 28.3%, indicating robustness and the potential for generalizing this framing result.

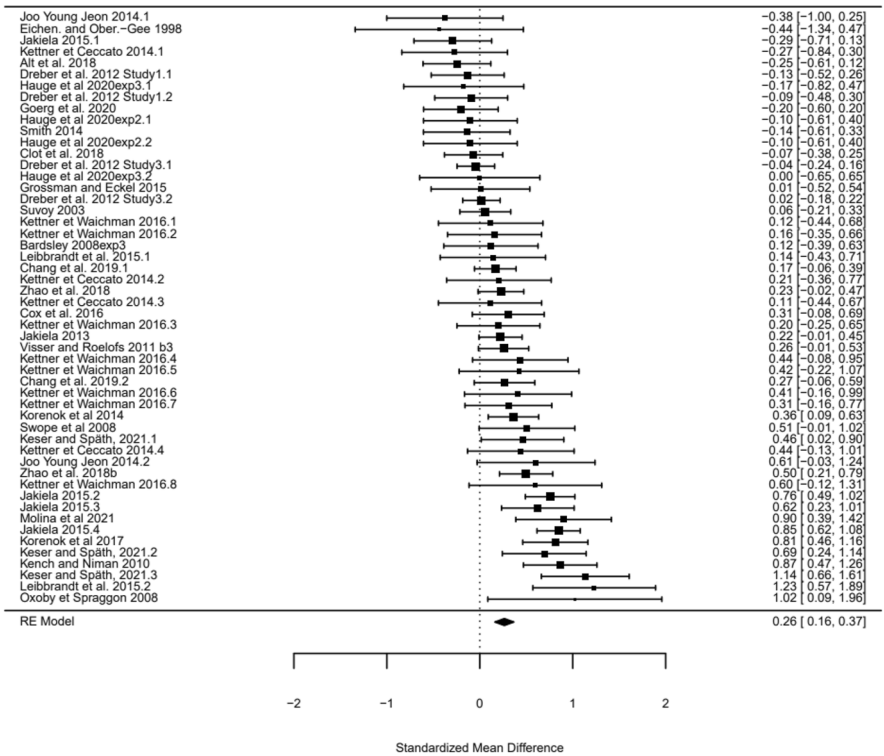
Result 1: Dictators are significantly more generous in TG than in DG

This framing effect appears robust against possible publication/selection bias. Indeed, the related p-curve (Fig. 2) shows a large proportion of very low p-values ('right-skewed'), which is a strong indicator of research integrity and the presence of a genuine effect. However, the sample of significant effect sizes that make up our p-curve is relatively small (around fifteen). Therefore, we also present the results of a funnel plot of these SMDs (Fig. 3). We observe a homogenous distribution of the dots around the true value, forming an image of an inverted funnel. This is further confirmed by the Egger's test ($p = 0.91$; Egger et al., 1997).

Finally, the effect sizes determined using the WLS method (Stanley & Doucouliagos, 2015, 2017)—a more effective method for managing potential publication bias—are highly similar to those identified by the RE model, leading to the same conclusions. With the WLS model, d also equals 0.26 [0.21, 0.31].

Significant heterogeneity is noticeable in the results (see τ^2), with a majority of the variability ($I^2 = 70\%$) not being attributable to sampling errors (differences in sample size), but rather to actual differences in effect sizes. These could be due to a variety of factors, such as differences in protocols, sample characteristics, and so forth. As a result, we carry out a multivariate meta-regression to identify the factors driving the framing effect. Although the comparison between the control group and the experimental group within each study already enables us to control largely for unobservable variables, it remains essential to also control for the observable variables that distinguish these studies.

Table 2 presents the results of a meta-regression of the SMD between the share given in the DG and the share left in the TG. We begin by presenting the results with only the variables deemed in the literature to have the most influence on the framing effect (reg. 1), i.e., whether the recipient is a charity or not, whether the endowment was earned prior to the division, or if the stakes in play are particularly



Note: This forest plot displays the standardized mean difference of offers in each study (point estimate as a square, two standard errors as lines). The diamond at the bottom indicates the effect size across studies (p-value < 0.0001, N =52 (Please note that two SMD outliers have been removed from this analysis to maintain sufficient homogeneity in the overall results. However, the four estimators comprising these outliers are not outliers in themselves—it is their difference that qualifies as an outlier—so they are included in the meta-analyses of means. Moreover, these two minor outliers are primarily due to genuine differences in the protocol used, the population tested, etc., so they are included in the meta-regression (see below) since between-study heterogeneity can be controlled. The value of *d* is 0.30 when these outliers are included)*: study level; 5320 observations,* $\tau^2 = 0.089$ with $SE = 0.0274$, $I^2 = 70\ \%$)

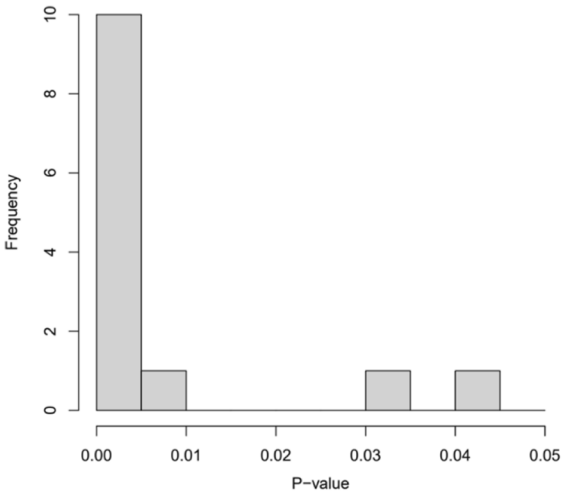
Fig. 1 Dictator games vs taking games (SMDs)

high. Subsequently, we examine the effect of all variables (reg. 2), using both RE and WLS models. Descriptive statistics of the variables used in the regressions are provided in the Appendix (Table 3).

Note that there is so little variability between students in the database regarding age that it is not really useful to take this variable into account, and the variability in age between workers and students can be considered as already controlled for by the variable *NotStudent*.

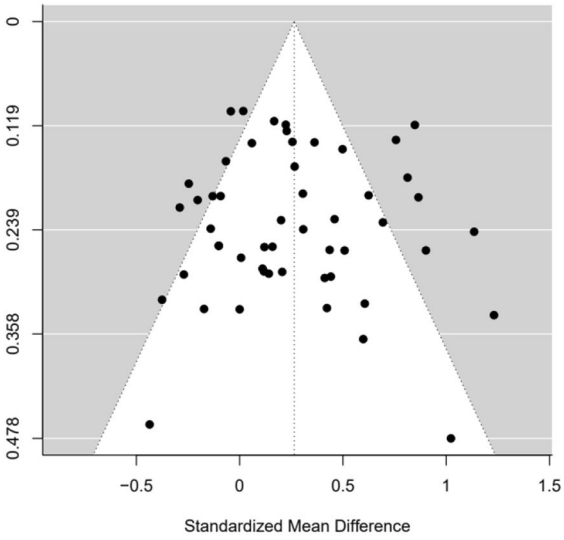
Multicollinearity is not to be overlooked in our regressions since a meta-regression analysis is more prone to this phenomenon than classical econometrics. Indeed, most explanatories are dummy variables. In our case, all explanatory variables present a variance inflation factor (VIF) less than 4. Small VIF values indicate low

Fig. 2 P-curve (SMDs)



Note: The x-axis represents the p-values (from 0 to 0.05), and the y-axis represents the proportion of studies with significant results at each p-value. A larger proportion of p-values must be close to 0.

Fig. 3 Funnel plot (SMDs)



Note: each dot represents a SMD (x-axis) estimated against the standard error of the SMD (y-axis), with a reversed scale that places the larger, most powerful studies toward the top.

Table 2 Meta-regression: independent variable: SMD ((mean share given in the TG – mean share given in the DG)/ pooled standard deviation))

	Model used			
	REML		WLS	
	(1)	(2)	(1)	(2)
Intercept	0.15**	0.15	0.16***	0.13
	(0.06)	(0.13)	(0.05)	(0.12)
NotStudent[(a)]		0.13		0.12
		(0.18)		(0.17)
Charity[(b)]	0.34**	0.44**	0.26*	0.48**
	(0.17)	(0.21)	(0.16)	(0.23)
Within[(c)]		0.01		0.09
		(0.15)		(0.12)
Bothrole[(d)]		− 0.21		− 0.10
		(0.18)		(0.16)
EarnEndowment[(e)]	0.57***	0.59***	0.57***	0.47***
	(0.16)	(0.18)	(0.14)	(0.16)
HighStakeSize[(f)]	0.44	0.41	− 0.22	− 0.12
	(0.27)	(0.27)	(0.23)	(0.23)
Hypothetical[(g)]		0.19		0.18
		(0.20)		(0.21)
NotPublished[(h)]		0.02		0.00
		(0.20)		(0.20)
NotDouble blind[(i)]		0.32		0.40
		(0.27)		(0.25)
NotOECD[(j)]		0.01		− 0.03
		(0.28)		(0.25)
NotinLab[(k)]		− 0.17		− 0.17
		(0.15)		(0.14)
NeutralWords[(l)]		− 0.15		− 0.11
		(0.17)		(0.17)
SameRef[(m)]		0.13		0.23
		(0.30)		(0.30)
N SMD	54	53	54	53
R-Squared	0.30	0.41	0.26	0.50

Robust standard errors in parentheses (standard errors are clustered at the author level in all specifications, to make them robust to intra-author dependence). ***p < 0.01, **p < 0.05, and *p < 0.1

Reference: (a) Student, (b) Traditional recipient (c) Between, (d) One role (Bothrole is a variable that takes the value 1 when the same participants played as dictator and recipient (with new partners in each role) (e) Endowment not earn, (f) Standard stake size (High-Stakesize is a variable that takes the value 1 when money at stake was high (e.g. representing several weeks or months of salary) and 0 when it was standard (e.g. 10 USD) , (g) Incentives, (h) Published, (i) Double-Blind, (j) OECD countries, (k) In the lab, (l) Active words (Neutralwords is a variable that takes the value 1 when the action terminology in the instructions was neutral (e.g. "transfer"," move to") and 0 when it was active words (e.g. "take" in TG or

Table 2 (continued) "give" in DG)., (m) Standard procedure (Samereference is a variable that takes the value 1 when dictators have the same reference point in both game (e.g. in Bardsley 2008, exp. 3)

correlation among variables. A limit value of 10 (or sometimes 5) is a rule of thumb commonly used in the literature (Hair et al., 1998).

We observe that few variables have a significant impact, which is not surprising, since our variable of interest pertains to a difference in offers between treatments, not the amount of the offer itself. While some variables are known to influence the offers, there is no clear reason why their impact should significantly vary with the giving/taking context.

We note that the coefficient for the variable *Charity* is positive and significant for both models, which implies that the framing effect (the difference between DG and TG) is larger when the recipient is a charity. It is probably because taking money from a charity is viewed as significantly less socially acceptable than not giving to it (this is also true for traditional recipients, as shown by the *Intercept*, but the difference is smaller). This result is consistent with Levitt and List's (2007) model of social preferences and the presence of a larger moral cost of taking than cost of not giving (Korenok et al., 2018).

Result 2: Framing effect is larger when the recipient is a charity

Moreover, enhancing the sense of ownership (Korenok et al., 2017), as evidenced when players earn their endowments (dictators in the DG and recipients in the TG) prior to sharing, also results in a more pronounced disparity in generosity between the TG and DG. This is indicated by the coefficient for the *EarnEndowment* variable, which is positive and highly significant. The augmented saliency of earned income may influence players' behavior more strongly than unearned income. This finding is particularly noteworthy as it attests to the robustness of the treatment effect. Treating the endowment as personal property mirrors real-life situations more closely.

This result also aligns with the existence of a taking aversion (Korenok et al., 2018), implying a larger moral cost associated with taking from someone who has earned their endowment, consistent with Baron's 'do not harm principle' (1995). However, this result can also be interpreted as evidence of heightened loss aversion when the dictator earns the endowment in the DG scenario. Indeed, the dictator may be less inclined to give if they perceive the endowment as truly theirs, but they may also show greater hesitation in taking away money perceived as truly belonging to the recipient.

Result 3: Framing effect is larger when participants earn their endowment before playing

Importantly, the framing effect remains significant when controlling for these variables of interest (see reg. 1), with unearned endowment, traditional recipients, and standard stake size. Interestingly, our findings suggest that the use of neutral/passive or active language in the instructions does not alter the behavioral disparities observed between these two games (refer to the *NeutralWords* variable). This

implies that the differences between the two games do not stem from a demand effect (coming from active words like 'take'), but rather are attributable to a genuine framing effect (Zizzo, 2010).

6 Conclusion

Do people exhibit greater generosity when placed in a taking frame rather than a giving frame? Does the act of taking elicit a stronger negative response than not giving in the context of charitable donations? A large experimental literature has investigated these questions, using a variant of the dictator game (DG), known as the "taking game" (TG) (also "gangster game" in rare cases), in which people take instead of give. Studying these questions is essential, as there are real-life instances where the taking frame already plays a significant role or could potentially play a role (e.g., opt-in/opt-out systems for organ donations, workplace giving programs, organization memberships and subscriptions, charitable contributions included in event ticket prices, automatic round-up programs).

To investigate these questions, we present in this paper the first meta-analysis of the TG. Our results show that dictators are significantly more generous in the TG than in the DG ($p < 0.0001$, Cohen's $d = 0.26$). In TG, they leave approximately 35.5 percent of the pie to the recipients, compared to 27.5 percent in DG. Notably, our control group results align closely with those of Engel (2011) who found a figure of 28.3 percent, indicating a certain robustness and possible generalization of the framing results.

Several theoretical elements could explain this difference in outcomes between the TG and the DG. One possibility is loss aversion (Kahneman & Tversky, 1979), as dictators do not have the same reference point in these games. Another explanation is a larger moral cost associated with taking rather than not giving, known as "taking aversion" (see Korenok et al., 2018 and Levitt & List's, 2007 model of social preferences). Additionally, the distinct default options each game presents could also play a role. However, we also found that this framing effect is more pronounced when participants have earned their endowment before sharing or when the recipient is a charity. This finding aligns more closely with the second explanation. The moral cost could stem from a dictator's desire to maintain a positive self-image, even when not observed by others (List, 2007). This desire could be intensified when the recipients have earned their endowment or are charities. These notions are in line with the widely recognized "do-no-harm" principle (Baron, 1995; Royzman & Baron, 2002; Van Beest et al., 2003, 2005), which suggests that people are typically more hesitant to profit if it means harming another, especially when the latter has no control over the outcomes.

A natural implication of our findings for decision-makers is the necessity to devote considerable attention to perceptions of giving and taking, and to the potential unintended effects of framing. For instance, this insight can be valuable for

the implementation of 'nudges' (Thaler & Sunstein, 2008) or other incentives. As illuminated by this meta-analysis, the impact of framing on generosity is accentuated when the beneficiary is a charitable organization or cause. One might naturally deduce that such entities should leverage this form of framing more intensively to bolster the donations they receive. However, it is critical to note that the increased generosity seen in this meta-analysis might only manifest in circumstances where participants were not provided a choice regarding their involvement in the game or the framing they were assigned. Indeed, Korenok et al. (2018) demonstrated that when presented with a choice, a significant majority of dictators preferred to participate in a giving game rather than a taking game, even when potential payoffs were identical. They were even willing to sacrifice a substantial portion of their endowment to avoid taking actions.

Consequently, the observed rise in donations in the TG, which can be attributed to a heightened moral cost associated with taking rather than not giving, may simultaneously lead to an increased discomfort among participants. While individuals might exhibit greater generosity in a taking frame, they may prefer to avoid engaging with such framing when given a choice. Therefore, while it might appear beneficial for organizations to employ this type of framing more frequently to amplify donations, it could paradoxically result in a decrease in overall participation. Thus, it is predominantly in situations where participants are confronted with a fait accompli, where they do not decide on their participation, that this framing could potentially have a positive impact on donations (e.g., organ donations, workplace giving programs). The most illustrative and closely related real-life example to these games remains the round-up programs.

To support noble causes such as aiding the victims of the Ukraine conflict, eradicating global hunger, or preserving the environment, supermarkets and other retail outlets often propose to consumers the option of rounding up their bill to the nearest euro or dollar (when making card payments). The additional cents then go to the designated cause. The consumer simply needs to press a button to confirm the proposition. Typically, this method garners good results, leveraging the moral cost of not giving. As one French consumer queried, 'What kind of person refuses to give 2 cents?' (Faure, 2020). However, it may be possible to boost donations even further by capitalizing on this framing effect. If bills were automatically rounded up to the nearest euro or dollar (given that round numbers are generally more appealing than those with decimals), but consumers had the option to reclaim the difference by pressing a button, it is likely that donations would rise even more (as actively retrieving money from the cause could carry a heavier moral burden than simply not giving). However, this potential increase in donations could likely bring about heightened discomfort among consumers.

Appendix

See Table 3

Table 3 Descriptive statistics of variables used in the meta-regression (Dep. variable: SMD; $N = 54$)

Dummy	Reference (Dummy = 0)	Frequency = 1	Frequency = 0	Frequency = NA
NotStudent	Students	15	39	0
Charity	Traditional recipients	6	48	0
Within	Between-procedure	9	45	0
Bothrole	Only one role	8	46	0
EarnEndowment	Endowment not earned	9	45	0
HighStakeSize	Standard stake size	3	51	0
Hypothetical	Incentivized	5	49	0
NotPublished	Data from published articles	12	42	0
NotDouble blind	Done in double blind	7	46	1
NotOECD	Experiments done in OECD	6	48	0
NotLab	Experiments in the lab	13	41	0
NeutralWords	Active words (take, give)	10	44	0
SameRef	Standard Procedure	2	52	0

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Data availability The replication material for the study is available at https://osf.io/bnpx6/.

Declarations

Conflict of interest The author declares no competing interests and funding.

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