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Social discounting in a symmetric giving and taking frame: An artifactual field experiment with young South African adults

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Abstract

In the dictator game, the evidence that giving is equivalent to taking is mixed. The purpose of this study was to investigate framing effects (giving/taking) on social-discounting rates among young African adults from an informal settlement in South Africa. Employing a within-participant design, these young adults completed a series of incentivized dictator games with an isomorphically equivalent giving and taking frame at each of eight social distances. Altruism was measured by the social-discounting rate, and framing effects were assessed using generalized linear regression. The study provides empirical evidence that prosocial behavior among young South African adults is subject to framing because exponential, hyperbolic, and q-exponential social-discounting rates in all instances were lower in the taking than in the giving frame. This difference may be the result of greater "egalitarianism" and "selflessness" elicited by the taking frame, which likely is a product of the experiment's particular social and economic field context. More comparative research is required to establish the working of specific mechanics of morality that may operate differently in diverse socioeconomic contexts, thus contributing to elucidating the heterogeneous nature of findings in this area of study.

KEYWORDS
dictator game, field experiment, giving, social discounting, taking

To study greed and framing effects, researchers have introduced a "taking" frame alongside the standard "giving" frame in the dictator game. In the giving frame, a dictator (participant) decides how much from their own endowment to give to a partner (recipient). In contrast, the taking frame places all or part of the endowment in the partner's hands, leaving the dictator to decide how much of the partner's endowment will be taken. The amount that is not taken from the partner (the remainder) is compared with the amount that is given to the partner in the giving frame. The experimental evidence on the effect of taking/giving framing on performance in the dictator game is mixed. On one hand, Bardsley (2008) and List (2007) reported that partners keep *less* in the taking frame than they received in the giving frame, a finding supported by Alt et al. (2018), Cappelen et al. (2013), and Cox et al. (2016). On the other hand, Korenok et al. (2014) and Visser and Roelofs (2011) found that partners got to keep *more* in the taking frame than what they received in the giving frame, which is supported by Jakiela (2013), Kench and Niman (2010), Moffatt and Zevallos (2021), Serdarevic and Tjøtta (2022), and Zhao et al. (2018). Although not directly comparable due to differences in design, however, many other studies have found that partners keep approximately as much in the taking frame as what they receive in the giving frame (Chowdhury et al., 2017; Dreber et al., 2013; Goerg et al., 2020; Grossman & Eckel, 2015; Kettner & Waichmann, 2016; Krupka & Weber, 2013; Smith, 2015; Suvoy, 2003). Even in meta-regression analysis there is no agreement on whether the taking frame in the dictator game enhances altruism (Engel, 2011; Zhang & Ortmann, 2014).

Many economic decisions are a function of social distance (Bechler et al., 2015). Few of the studies on giving and taking, however, introduce a social distance frame in their experimental design. Basically, in experiments with such social distance frames, participants make choices

regarding the allocation of resources to recipients to whom they are socially related in a specific way. Such frames are constructed in a variety of ways, most commonly in terms of a mentally constructed numerical scale of an ordinal nature or a literally predefined set of relations such as parents, siblings, or complete strangers. Kench and Niman (2010) adopted a social distance frame (based on university affiliation) alongside the taking and giving frame but did not investigate whether the giving and taking frame had different effects across social distance. Alt et al. (2018) indirectly introduced the equivalent of a social distance frame (artificially constructed in a laboratory setting) by comparing choices that were made under a giving and taking frame across three treatments: a stranger treatment (∼no social distance), an in-group treatment (∼low social distance), and an out-group treatment (∼intermediate social distance). The authors found that the partner received more in the giving frame than they kept in the taking frame if the partner was a stranger but that this was reversed in the in-group treatment, with the kept (remainder) amounts (taking frame) exceeding the received amounts in the giving frame. This suggests that differences between choices made in giving as opposed to taking frames may be a function of social context, highlighting the importance of adopting social distance frames in studies of giving and taking.

These studies on giving and taking furthermore employ the prevalence of nonzero transfers and the amount transferred between dictator and recipient as measures of altruism and, when social distance is incorporated into the analysis, can compare these outcomes across alternate social distance contexts. The social-discounting rate, defined as the decline in generosity or amount given to the recipient with increasing social distance (Jones and Rachlin, 2006; Takahashi, 2007), can demonstrate the overall sensitivity to social distance in altruistic choices (Jones, 2021), thereby representing an alternative summary measure of altruism (Olson et al., 2016) or, as Rachlin and Locey (2011, 32) describe it, as "a measure of the extent of a behavioral pattern" of altruism. To date, no studies, including Alt et al. (2018), have assessed how social-discounting rates may differ when assessed in a conventional giving context as opposed to a taking frame. Yet, this is important insofar as the social norm of altruism emerges in a social context (Fehr & Rockenbach, 2004; Pereda et al., 2017; Simpson & Willer, 2015).

Our empirical study reports on the results from an artifactual field experiment (Harrison & List 2004) and addresses this knowledge gap. The study was an investigation of the effects of giving/taking framing on social discounting among young adults from an informal settlement in South Africa that is characterized by high levels of poverty and inequality. The study was conducted in a developing, non-WEIRD (Western, Educated, Industrialized, Rich, and Democratic society; Henrich et al., 2010) country in a field setting as opposed to a context like Alt et al.'s (2018) university-based experimental setting. This study is the only research, to our knowledge, that applies a social distance lens to the giving–taking task in a field setting. Another contribution of this study is the use of social-discounting rate as derived from judgements that are exercised in a framed dictator game as the outcome measure rather than using social-discounting rate as derived from choices that are exercised in the traditional social-discounting task and merely comparing allocations across social distance. Despite the loss of information that such an approach entails in terms of aggregating information across social distances, the advantage is that it allows us to answer a novel research question—namely, whether social discounting varies across the taking and giving frame. Furthermore, comparisons are made between alternative forms of the social-discounting function (exponential, hyperbolic, q-exponential), whereas the majority of social-discounting studies, following Mazur (1987), assume social discounting to be exclusively hyperbolic in nature. Together, the unique nature of this study lies in not only its empirical context that reaches beyond the laboratory but also its methodological approach.

Theory

Social discounting

According to the economist Julian Simon (1995), the allocation of resources is discounted not only temporally (via choices regarding current as opposed to future consumption) but also socially (via choices regarding personal consumption as opposed to allocations to others). This social-discounting function dictates that, as social distance increases, people are "willing to forego less money for themselves in order to give a fixed amount to another person" (Jones & Rachlin, 2009, 61). Altruism therefore declines with social distance (Rachlin & Jones, 2010). Following Takahashi (2013), we examine alternative discounting models in constructing the social-discounting rates for the participants in our study—namely, the exponential, hyperbolic, and q-exponential discounting functions—which allows us to assess whether our results are robust to alternative specifications of the discounting functions.

Hypothesis

Early in the century, Howard Rachlin (2002, 245) emphasized that a "moral code may approve of some kinds of altruism but disapprove of others." Moreover, according to Capraro and Rand (2018) moral preferences drive human prosociality, with evidence suggesting that adding moral labels to social choices substantially

increases prosociality. Therefore, utility is derived from a preference for doing the "right thing" or doing what is "morally right," encapsulated in a generalized morality preference (Tappin & Capraro, 2018). What we do know is that taking generally is not considered morally acceptable because negative, bad, or immoral stimuli (such as taking) weigh more than their positive, good, or moral counterparts (such as giving) in human cognition and behavior (Tappin & Capraro, 2018). In other words, the person we want to avoid being (i.e., the taker) outweighs the type of person we ideally want to be (i.e., the giver). A similar symmetry is revealed in the psychology of moral regulation, with prescriptive morality (what to avoid being or doing, in this case taking) and proscriptive morality (what you should be or do, in this case giving) being mandatory and discretionary, respectively (Tappin & Capraro, 2018). Dictators may also perceive taking as harmful in and of itself at a psychosocial level and thus may refrain from it on moral grounds, which is consistent with harm aversion (Greene, 2014; Nowak & Sigmund, 2005), and taking could be associated with stealing, which may have a substantial moral cost (Hermann & Mußhoff, 2019). Supporting such claims is the empirical evidence presented by Serdarevic and Tjøtta (2022) among Danish citizens. Taking, therefore, may be considered as less socially appropriate than giving, which means that by taking the dictator incurs a moral cost.

Levitt and List (2007), moreover, proposed a utility function that is useful in further contextualizing our hypothesis. The utility function is presented as $U_i(a,v,n,s) = M_i(a,v,n,s) + W_i(a,v)$. In this basic utility function, utility is a function of wealth (W) and of moral cost or benefit (M), where W is a function of the action (a) and the stakes (v) and M is a function of both a and of v (a financial externality increasing with the stakes or payoff) as well as social norms (n) and, importantly, scrutiny (s). In our case, the action is whether to give or take a certain amount of money from the person at the relevant social distance. Our point of departure in this article, given the manner in which the choice task was designed, is that decisions regarding taking or not taking are moral choices but are dependent, in this case, not on s (because anonymity in experimental terms is identical across the taking and giving frame) but on n, where the social norm to not take is stronger than the social norm to give, for reasons outlined in the preceding paragraph. Therefore, under similar scrutiny, this moral cost related to social norms is relatively more salient in the dictator's mind for taking than giving than the issue of anonymity is. For this reason, we hypothesize that altruistic choices to not take are socially discounted to a lesser degree than are choices to give. As Law et al. (2022) points out, moreover, it is important to investigate such moral judgements in real-world social contexts where social norms are especially salient, which is what our field-based experiment set out to do.

METHODS

Participants

The participants were 240 young adults between the ages of 18 and 24 years. The focus on young adults is relevant due to the importance of the development of altruistic preferences over the life cycle (Sparrow et al., 2019). The sociodemographic characteristics of the participants are summarized in Table 1. A distinction is made between the full sample of 233 young adults with no missing information on all the study variables (representing 97.1% of the original sample) and the analytical sample. The latter group of participants excludes participants whose response pattern to the choice task was not monotonically decreasing in either the giving or in the taking frame ($n = 179$), which is a necessary condition for estimating each of the three forms of the social-discounting function that was used to construct the outcome measures that were employed in the empirical analyses. Importantly, however, the latter sample, which comprises 76.8% of the full sample, is not statistically significantly different from the full sample on any of the sociodemographic characteristics reported in Table 1 when compared using t tests or when selection bias is assessed using a logistic regression model in which these sociodemographic characteristics are regressed on a binary variable indicating whether the participant belongs to the analytical or the full sample. This provides some confidence in the results being unlikely to be biased due to the selection into the analytical sample of participants with unique characteristics that are different from those of the full sample.

The mean age of the study participants in the analytical sample that we employ in our analysis was 20.6 years, and 52.5% of these participants were females. Most of these participants were unemployed (73.7%), not yet married (78.7%), and had some secondary schooling (58.6%) or had completed at least their secondary schooling (30.7%; Table 1). The study participants on average scored low (3.98) on the 10-point Cantril scale measuring subjective economic well-being.

Procedure

Participants were recruited in an informal settlement in the city of Mangaung in the Free State province of South Africa. Trained enumerators visited dwellings on a door-to-door basis and identified households with young adults. Where households included multiple young adults, a Kish grid was used to randomly select one of the young adults (see Supplementary Material S1).

Consenting participants then first completed a sociodemographic questionnaire, followed by a series of questions on health, health behavior, and well-being. Next, the Sesotho translation of the Global Preferences

TABLE 1 Sample characteristics.

Variable		Full sample		Analytical sample	
		Mean or %	Standard deviation	Mean or %	Standard deviation
Age (years)	Mean	20.57	2.10	20.55	2.14
Gender (%)	Female	50.21	0.50	52.51	0.50
	Male	49.79	0.50	47.49	0.50
	Total	*100.00*		*100.00*	
Marital status (%)	Married	4.72	0.21	5.59	0.23
	Living together	17.17	0.37	15.64	0.36
	Never married	78.11	0.41	78.77	0.41
	Total	*100.00*		*100.00*	
Education (%)	None	0.86	0.09	0.56	0.07
	Primary	7.72	0.26	8.38	0.27
	Some secondary	57.51	0.49	58.66	0.49
	Grade 12	30.47	0.46	29.61	0.45
	Tertiary	1.29	0.11	1.12	0.10
	Other	2.15	0.14	1.67	0.12
	Total	*100.00*		*100.00*	
Employment status (%)	Student/learner	21.03	0.40	20.11	0.40
	Unemployed	73.39	0.44	73.74	0.44
	Employed	5.58	0.23	6.15	0.24
	Total	*100.00*		*100.00*	
Subjective economic well-being	Mean	4.02	2.02	3.98	2.06
Sample (*n*)		233		179	

Survey (GPS) was administered to participants (Falk et al., 2016, 2018) (see Supplementary Material S2). Finally, participants completed the dictator game task. In the latter task, the order of the giving and taking tasks was reversed for half of the sample. Similarly, the order of the social distances was counterbalanced in this task to control for possible order effects (see Supplementary Material S3).

Payment

Following the completion of the instruments and choice tasks, a within-participant random incentive system (RIS) was used to calculate each participant's earnings (Baltussen et al., 2012). First, 24 participants (i.e., 10% of the pool) were randomly selected from the total pool of respondents using Stata's *sample* command. A four-sided die was then used to randomly select one of the two tasks—giving or taking—for each of the selected participants. Next, one of the eight social distances was selected randomly using an eight-sided die. The selected participant's choice on this individual task was implemented for actual payment. For example, if the selected choice was in the taking frame at social distance 10 and the selected participant took ZAR40, which left the recipient with ZAR60, the participant was paid ZAR40 and the recipient received ZAR60, respectively. In this specific case, both the participant and recipient received money. If, however, the participant took all of the ZAR100 from the recipient, only the participant received money, in this instance the full ZAR100. Where the participant did not take any money from the recipient, only the recipient was paid the full ZAR100. If the social distance selected for payment was the 50th or 100th position and an amount had to be paid to the recipient, such amount was donated to a charitable organization (Kovsie Foodbank). Participants were not privy to the latter information before exercising their choices, and this detail was only disclosed to them after completion of the choice tasks. The experimenters implemented the payment process following the completion of the survey. These payments were made in private and via mobile phone for cash withdrawal at a bank's automated teller machine. Participants who were selected to receive payment on average earned ZAR53, whereas an average amount of ZAR47 was paid to the corresponding recipients. All participants consenting to participate in the study received compensation to the value of ZAR50, but only after completion of the interview. This compensation was equivalent to twice the national hourly minimum wage.

Tasks

The dictator game is the most popular workhorse of experimental and behavioral economists in their study of altruism. In this study, participants completed a dictator game task similar to the ones described in Chowdhury et al. (2017) and Korenok et al. (2014). Specifically, in the current study, the instruction that was given to the participants, in vernacular language, was "You will make two choices in the two tasks. In one task, we will assume that you have access to ZAR100 (i.e., 100 South African Rand). You will be asked to divide this amount between yourself and a specific person on the list, and this is your 'giving' choice. In the other task, we will assume that a specific person on the list has access to ZAR100. You now will have to decide how much of the ZAR100 to take from this person, and that is your 'taking' choice." Thus, the framing was such that the entire endowment was linked with a specific person whose social distance from the participant could be manipulated.

Unlike in the research by Chowdhury et al. (2017) and Korenok et al. (2014), participants in this study made a separate choice for each of eight social distances (1, 2, 3, 5, 10, 20, 50, 100). Participants were first asked to construct a social hierarchy using the following instruction: "Imagine that you have made a list of the 100 people closest to you in the world ranging from your dearest friend or relative at position #1 to a complete stranger at #100. The person at #1 would be someone you know well and is your closest friend or relative. The person at #100 is a complete stranger" (see Supplementary Material S3). This stage of mental ranking of recipients happened at the outset of the dictator game task in the experiment, before the participants knew that the game was about sharing/transferring money to someone else. In addition, participants were asked to provide a contact number for each of the recipients, but only up to the 20th rank. Therefore, participants had a clear person in mind for each social distance up to the 20th rank. This information was collected to enable the research team to make payments to recipients (see Payment procedure). Information that was given in the consent form about money indicated only the compensation of ZAR50 that the experimenters paid to the participants in the study. Thus, at the point of listing the possible recipients for each social distance, no information was available to participants about whether the money would actually be shared with anyone. This was done so that the participants would not be thinking about the effects of windfall gains on the people occupying the social distances when those recipients were listed. Also, the participants were in an informal settlement where economic experiments are not common and one would not expect participants to guess that there will be money to be shared.

As an example, an excerpt from the experimental instructions and format for the giving task (English translation) are given below (see Supplementary Material S3 for additional details).

Giving task

Instruction:
You have access to R100. You have to make a simple decision. You have to decide how much of the R100, if any, to keep for yourself and how much of the R100 to give to the person in a specific position. Your choice can be anywhere from R0 to R100, in R10 increments for each of the persons.
Let us start:
How much will you give to person #1 [name]?
Assuming you have access to another R100, how much will you give to person #2 [name]?
With another R100 at your disposal, how much will you give to person #3 [name]?
Assuming that you have R100 for each choice, how much will you give to person #5 [name]?
How about Person #10 [name]?
And person #20 [name]?
How much of the R100 will you give to person #50?
And to a complete stranger (person #100)?

	First name	Amount (Rand)										
1		0	10	20	30	40	50	60	70	80	90	100
2		0	10	20	30	40	50	60	70	80	90	100
3		0	10	20	30	40	50	60	70	80	90	100
5		0	10	20	30	40	50	60	70	80	90	100
10		0	10	20	30	40	50	60	70	80	90	100
20		0	10	20	30	40	50	60	70	80	90	100
50	n/a	0	10	20	30	40	50	60	70	80	90	100
100	n/a	0	10	20	30	40	50	60	70	80	90	100

Possible allocations in South African rand were made in multiples of ZAR10 to the person at each social distance from an endowment of ZAR100. The experimenter was required to circle a single amount indicating the maximum desired transfer amount *from* the participant in each of the eight rows representing social distance. For the taking task, the circled amount was the maximum transfer *to* the participant.

In addition to measuring giving and taking at distinct social distances with the aid of a modified dictator game, we employed selected data from the sociodemographic questionnaire that was completed by participants (as outlined in the sections on Procedure and Analysis) as indicators of age, gender, education, marital status, and employment status. Subjective economic well-being was measured using a 10-point Cantril scale (Cantril, 1965). Measures of positive reciprocity (representing the willingness to return a favor: "When someone does me a favor, I am willing to return it," with responses ranging from 0 [*does not describe me at all*] to 10 [*describes me perfectly*]) and of trust (represented by the assumption that people have only the best intentions: "I assume that people have only the best attentions," with responses ranging from 0 [*does not describe me at all*] to 10 [*describes me perfectly*]) were

TABLE 2 Discounting functions.

Exponential	Hyperbolic	q-Exponential
$v_{ij} = \frac{A_i}{k_e N_{ij}}$ (1)	$v_{ij} = \frac{A_i}{1 + k_h N_{ij}}$ (2)	$v_{ij} = \frac{A_i}{\left(1 + k_q (1-q) N_{ij}\right)^{1/(1-q)}}$ (3)

adopted from the Global Preference Survey (GPS; Falk et al., 2016, 2018; see Procedure and Supplementary Material S2).[1]

Outcome measures

For the study outcomes, we used the transfer amounts for the giving and taking frames to compute the exponential, hyperbolic, and q-exponential social-discounting rates for each participant, using the discounting functions as presented in Takahashi's (2013) experimental work on discounting in loss and gain frames (Table 2).

In these functions, v_{ij} represents the value that the young adult participant i attaches to the welfare of another person j on the participant's social distance list. This determines the amount that the participant is willing to give (not take) to (from) person j out of the ZAR100 house money (see Supplementary Material S3). The variable A_i in the function is the socially undiscounted value of the house money and represents the value that participant i associates with their own welfare, and N_{ij} is the rank that they assign to person j among i's full list of associated people. Thus, k_e is the exponential social-discounting rate, k_h is the hyperbolic social-discounting rate, and k_q is the q-exponential discounting rate. The q-exponential discounting function further estimates the deviation of the participant's social discounting from exponential discounting $(1-q)$ such that when $q = 0$, Equation 3 is equivalent to Equation 2 and when $q \to 1$, Equation 3 is equivalent to Equation 1 (Takahashi, 2013).

Thus, the values that were used to estimate the discounting rates are the transfers given to person j (for the giving frame) or "not taken" from person j (for the taking frame) and, as discussed earlier, the values range from ZAR0 to ZAR100. When the choice set consists of transfers of ZAR100 to all the persons in the social distance list, the participant did not discount socially at all and the social-discounting rate (k) approaches zero. When the choice set consists of transfers of ZAR0 to all the persons in the social distance list, the participant completely discounted socially and the social-discounting rate (k) is infinitely high. Thus, k measures the steepness of socially discounting: the greater k, the greater the degree of social discounting and the lower the degree of altruism (Bechler et al., 2015; Sharp et al., 2012). Participants who are extremely selfish keep everything for themselves (in the giving frame) or take everything from the recipient (in the taking frame) at each of the eight social distances, whereas those who are most altruistic generously transfer all their resources to the recipient (giving frame) or do not take anything from the recipient (taking frame) at each of the eight social distances.

[1]We collected additional data on various other outcomes as part of our study but do not employ these data in the analysis presented in this article because the indicators in the larger data set were collected for purposes related to the multiple other objectives of the larger research project that focused on health behavioral intentions of young adults and on economic preferences.

TABLE 3 Mean transfer amount (ZAR), by social distance and frame.

Social distance	Giving	Taking	Mean difference	F (1, 282)
1	66.04	69.66	−3.61	1.79
	(1.91)	(1.88)		$p = .182$
2	53.11	61.74	−8.62	11.63
	(1.84)	(1.68)		$p < .001$
3	43.71	54.12	−10.40	19.58
	(1.66)	(1.64)		$p < .001$
5	36.67	45.58	−8.91	13.33
	(1.62)	(1.58)		$p < .001$
10	30.52	37.91	−7.38	8.53
	(1.66)	(1.94)		$p = .003$
20	25.97	32.14	−6.17	5.76
	(1.65)	(2.03)		$p = .017$
50	6.55	6.39	0.15	0.01
	(0.81)	(1.32)		$p = .918$
100	6.06	5.35	0.70	0.25
	(0.79)	(1.25)		$p = .619$
Mean	33.58	39.11	−5.53	21.27
	(0.76)	(0.94)		$p < .001$
F	183.37	190.68		
p	$p < .001$	$p < .001$		

Note: Adjusted for response bias using IPWs. Standard error of the means in parentheses.

Analysis

The data set employed in the analysis is available at 10.17632/mmtmsmv4wy.3. The analyses comprised two parts: a descriptive analysis and a regression analysis. In the descriptive analysis, mean transfers are first compared across each of the eight social distances for the giving and taking frames (Table 3) using a combination of analyses of variance (ANOVAs) and t tests. Using the transfer amounts for each of the frames and for each individual, we derived the social-discounting rates for each of the three discounting functions (Table 2). The means of these social discounting rates were then compared between the giving and taking task frames (Table 4). Because the social-discounting rates are skewed and heteroscedastic, we opted for the generalized linear regression modeling (GLM) discussed below.

TABLE 4 Social-discounting rates (k) by discounting function and frame.

	Giving	Taking	F (1, 282)	Joint skewness and kurtosis χ^2 test
Exponential	0.362	0.204	15.43	155.91
	(0.032)	(0.019)	$p < .001$	$p < .001$
Hyperbolic	0.724	0.388	11.30	185.77
	(0.081)	(0.050)	$p < .001$	$p < .001$
q-Exponential	2,953.274	1.306	1.71	447.03
	(2,063.338)	(0.287)	$p = .192$	$p < .001$
Sample (n)	*166*	*117*		

Note: Adjusted for response bias using IPWs. Standard errors in parentheses.

TABLE 5 Framing and social discounting by social-discounting model.

	Exponential	Hyperbolic	q-Exponential
Taking vs. Giving (semirobust standard error)	2.598 (0.727)	1.422 (0.420)	0.690 (0.188)
z	3.57	3.38	3.66
p	$p < .001$	$p = .001$	$p < .001$
df	270	270	270
Residual deviance	310.686	365.437	1,781.616
Pregibon link test			
z	0.32	0.38	1.78
p	$p = .749$	$p = .706$	$p = .074$
Pearson correlation test			
r	0.0033	0.0143	0.0009
p	$p = .956$	$p = .811$	$p = .988$
Sample (n)	283	283	283

Note: Generalized linear model (GLM) with power link (−1.1) and gamma family, adjusted for task frame order, social distance order, gender, age, education, employment status, marital status, subjective economic well-being, whether the subject was a student (laboratory subject), positive reciprocity, and trust. Adjusted for response bias using IPWs. Due to the inverse link function used for GLMs, in the current situation, the covariate of interest reports a positive coefficient, implying that, in reciprocal sense, the taking frame associates with lower k values and the giving frame associates with higher k values.

In the regression analysis, GLM was employed with the aid of Stata's *glm* routine to determine how the task frame (0 = giving frame and 1 = taking frame) was associated with each of the three social-discounting rates derived from the three discounting functions: exponential, hyperbolic, and q-exponential. The GLM analysis had three primary components: a structural component that specifies the linear combination of the predictors, a random component specified by some distributional family, and a link function that transforms the expected value of the response such that the mean value of the outcome of interest is related to the structural component (Ng & Cribbie, 2017). In our analysis, the GLM can be presented as follows: $g[E(k|x)] = \alpha + \beta_{TG}TG + \sum \beta_j x_{ij}$, where k is the outcome variable (social-discounting rate: k_e, k_h, or k_q), TG is the covariate of interest (giving–taking frame), and $\sum \beta_j x_{ij}$ represents other covariates (controls). So, $E(k|x)$ was the expected values of the outcome variable and $\alpha + \beta_{TG}TG + \sum \beta_j x_{ij}$ is the linear combination of predictors. Also, $k \sim F$ such that F was the distributional family. Our outcome variable has some assumed sort of distribution, and $g(.)$ represents the link function.

We estimated a GLM with a canonical power link function of −1.1 and a gamma distribution family, using an iterated reweighted least squares estimation algorithm, which is better at mitigating potential problems with outliers (especially in the q-exponential discounting rate, as reflected in the summary statistics in Table 4) than the standard Newton–Raphson maximum-likelihood algorithm (Hardin & Hilbe, 2012). The gamma family, according to Ng and Cribbie (2017), is especially appropriate for modeling continuous, skewed, and heteroscedastic outcomes. Our dependent variables all exhibit both significant skewness as well as heteroscedasticity. The former is evident from the joint skewness and kurtosis test for normality implemented using Stata's *sktest* (exponential: $\chi^2 = 155.91$, $p < .001$; hyperbolic: $\chi^2 = 185.77$, $p < .001$); q-exponential: $\chi^2 = 447.03$, $p < .001$). The latter is substantiated by the rejection of the null hypothesis of homoscedasticity in the Breusch–Pagan test, conducted by estimating an ordinary least squares model with the relevant discounting rate as the dependent variable and the other covariates in our regression model (see below) as independent variables. The relevant Breusch–Pagan test statistics are as follows: (exponential: $\chi^2 = 98.63$, $p < .001$; hyperbolic: $\chi^2 = 132.06$, $p < .001$; q-exponential: $\chi^2 = 1{,}110.27$, $p < .001$). In turn, power link functions have the advantage of being especially flexible and ideally suited to fine-tuning GLM models to find the optimal fit (Hardin & Hilbe, 2012). In our case, a link function with a power of −1.1 resulted in the best model fit, with criteria for both the Pregibon (1980) link test and the Pearson correlation test (Ng & Cribbie, 2017) being met.

The regression results, presented in Table 5, were adjusted for task order (giving/taking) and social distance order (ascending/descending), respectively, two important features of the choice task. In addition, we controlled for the participant's age, gender, education, employment status, marital status, subjective economic well-being, positive reciprocity, and trust. We controlled for positive reciprocity and for trust to address the tendency of people to be generous in expectation of quid pro quo (reciprocity principle) and being generous to those with good reputation and therefore trusted (Denic & Agarwal, 2022).

In addition, as we do not have complete data on both the giving and taking task for all 179 subjects in the analytical sample described in Table 1, we employ inverse

probability weights (IPWs) in our various analyses to counter potential response bias and preserve maximum statistical power. The IPWs were constructed with the aid of a logistic regression model in which "response" (having a valid social-discounting rate) was predicted by task frame, order of the giving and taking and the social-discounting tasks, age, gender, education, subjective economic well-being, whether the subject was a student (laboratory subject), and self-reported proficiency in mathematics (as reported in the GPS). As explained above, we excluded response patterns to the giving and taking choice tasks that were not monotonically decreasing from our analysis. As a result, we have valid social-discounting rates for only 283 or 79.1% of the 358 potential discounting parameters for the full analytical sample. Of the 179 subjects in our analytical sample, 104 have valid discounting rates for both task frames, 62 subjects for only the giving frame, and 13 subjects for only the taking frame.

RESULTS

Table 3 illustrates that the transfer amounts—that is, the amounts given (giving frame) and not taken (taking frame)—show the expected relationship with social distance—declining as social distance increases—and that this is statistically significant. The mean differences between the two frames are also statistically significant in many instances, except for the person closest to the dictator (Social Distance 1) as well as at the 50th and 100th positions on the social-discounting continuum.

As shown in Table 4, the aggregate social-discounting rates were consistently higher in the giving frame than in the taking frame. When comparing the mean social-discounting rates computed using the three functions, by frame, the exponential, $F(1, 282) = 15.43$, $p < .001$, and hyperbolic, $F(1, 282) = 11.30$, $p < .001$, functions differed statistically between the two frames. However, the q-exponential discounting rate shows no significant difference, $F(1, 282) = 1.71$, $p > .10$.

According to the regression diagnostics presented in Table 5, the power-gamma GLM represents a suitable specification of the link function, with the p values for both the Pregibon and Pearson correlation goodness-of-link tests exceeding .50. In support of the descriptive results presented in Table 4, the GLM regression results (Table 5) provide further robust evidence of a negative and statistically significant framing effect ($p < .001$)—that is, social discounting being lower in the taking frame than in the giving frame. This is the case for all three discounting models (exponential: $\beta = 2.598$, 95% CI [1.173, 4.023]; hyperbolic: $\beta = 1.422$, 95% CI [0.598, 2.246]; q-exponential: $\beta = 0.690$, 95% CI [0.320, 1.060]).

The remaining question concerns identifying explanations for the results indicating that social discounting is lower in the taking than in the giving frame (higher transfer amounts in the taking game). For this purpose, we interrogate the distribution of the individual allocations made in the giving as opposed to the taking frame at different social distances, as represented in Figure 1. We contract the social distance variable into four groups based on the original social distances: immediate relations (1; 2); close relations (3; 5); intermediate relations (10; 20); and distant relations (50; 100). The choice types are represented by being completely selfish (giving or leaving nothing of the endowment), egalitarian (a 50:50 split of the endowment), or completely selfless (giving or leaving the entire endowment), respectively. In addition, we distinguish between choices that are "somewhat selfish" (nonzero but ≤ ZAR40) and "somewhat selfless" (values ≥ ZAR60 but ≤ ZAR90), respectively.

Selfishness (i.e., giving or leaving nothing) is significantly more pronounced in the taking frame than in the giving frame, $F(1, 2263) = 6.71$, $p = .009$. Selfishness, as expected, also increases significantly with social distance, giving: $F(3, 1327) = 338.54$, $p < .001$; taking: $F(3, 935) = 466.26$, $p < .001$. The proportion of selfishness in the taking frame exceeded that in the giving frame only for distant social relations, $F(1, 565) = 18.53$, $p < .001$, with no significant differences observed across the frame at other social distances. Interestingly, the distribution of somewhat selfish choices across social distance, although statistically significantly different—giving: $F(3, 1327) = 65.68$; taking: $F(3, 935) = 51.58$, respectively, $p < .001$—is not, as one would expect, strictly increasing. Rather, the distribution exhibits a prominent inverted-U shape, increasing steadily as one moves from immediate, to close, to intermediate social distances but then dropping markedly for distant social relations. In all instances, the proportion of somewhat selfish choices in the giving frame exceeds that in the taking frame—immediate relations: $F(1, 565) = 17.22$, $p < .001$; close relations: $F(1, 565) = 32.38$, $p < .001$; intermediate relations: $F(1, 565) = 14.63$, $p = .002$; and distant relations: $F(1, 565) = 26.63$, $p < .001$. When jointly considering the fully and somewhat selfish allocations, the prevalence of selfishness is markedly lower in the taking than in the giving frame, $F(1, 2263) = 39.99$, $p < .001$, and this is the case in all four of the social distance groupings—immediate relations: $F(1, 565) = 17.22$, $p < .001$; close relations: $F(1, 565) = 34.92$, $p < .001$; intermediate relations: $F(1, 565) = 12.32$, $p < .001$; and distant relations: $F(1, 565) = 3.95$, $p = .047$.

The picture for egalitarian choices shows an opposite pattern, as expected, with the proportion of egalitarian choices declining with social distance. Participants made more egalitarian choices toward those closer to them than toward those at a greater social distance, $F(3, 1327) = 45.11$, $p < .001$, but they did so only in the giving frame. The distribution for egalitarian choices in the taking frame exhibits an inverted-U shape, $F(3, 935) = 34.04$, $p < .001$, with the proportion of egalitarian choices increasing from immediate to close relations but then declining, with the lowest proportion reported

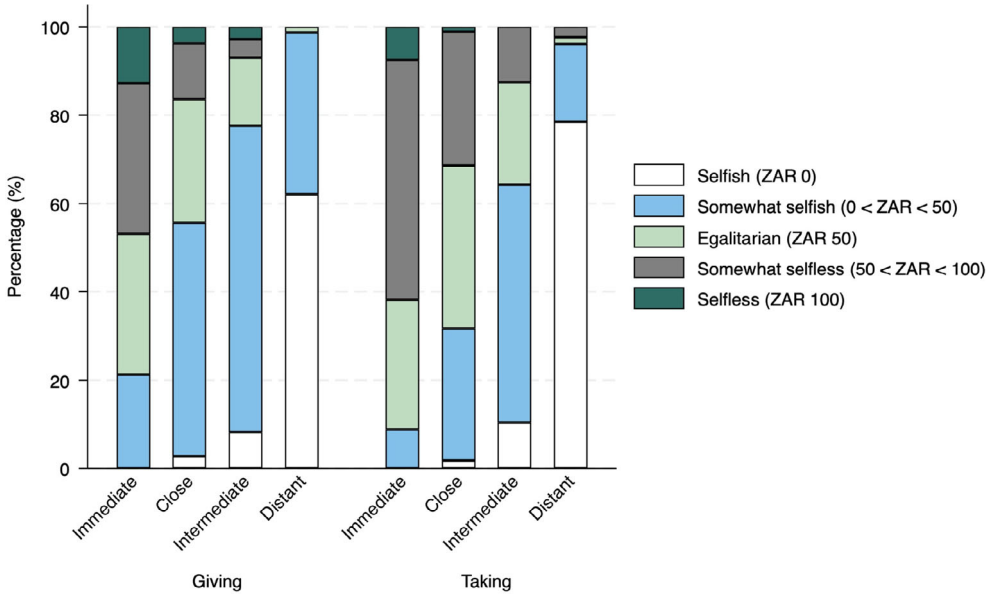

FIGURE 1 Prevalence of choice types by frame and social distance, adjusted for response bias using IPWs.

for distant relations. Most importantly, however, is the fact that these differences, apart from the proportion of choices made at immediate and distant social distances, differ statistically significantly across the two task frames. In each instance, egalitarianism is greater in the taking than in the giving frame—close relations: $F(1, 565) = 5.13$, $p = .024$; intermediate relations: $F(1, 565) = 5.39$, $p = .020$. Therefore, participants were equally egalitarian toward immediate and distant relations.

Finally, we see the distribution of selfless choices between the giving and taking frames exhibiting similar trends. In both the giving frame, $F(3, 1327) = 23.08$, $p < .001$, and the taking frame, $F(3, 935) = 15.08$, $p < .001$, selflessness, as one would expect, declines statistically significantly with social distance. On the social distance hierarchy, we observe greater selflessness in the giving than in the taking frame for immediate social distances, $F(1, 565) = 4.25$, $p = .039$; close social distances, $F(1, 565) = 4.11$, $p = .043$; and intermediate social distances, $F(1, 565) = 7.91$, $p = .005$. For distant relations, however, we observe no difference, with no selfless choices being observed in either the taking or the giving frame. As one would expect, the proportion of somewhat selfless choices also declines with social distance, significantly so—giving: $F(3, 1327) = 81.61$, $p < .001$; taking: $F(3, 935) = 81.77$, $p < .001$. In all instances, the proportion of somewhat selfless choices in the taking frame significantly exceeds that in the giving frame—immediate relations: $F(1, 565) = 24.34$, $p < .001$; close relations: $F(1, 565) = 27.67$, $p < .001$; intermediate relations: $F(1, 565) = 13.34$, $p < .001$; and distant relations: $F(1, 565) = 6.87$, $p = .009$. When considered jointly, however, the prevalence of selflessness, as represented by being entirely or somewhat selfless, is greater in the taking frame than in the giving frame, $F(1, 2263) = 29.92$, $p < .001$. This is the case for immediate relations, $F(1, 565) = 13.02$, $p < .001$; close relations, $F(1, 565) = 18.33$, $p < .001$; intermediate relations, $F(1, 565) = 5.07$, $p = .024$; and distant relations $F(1, 565) = 6.87$, $p = .009$.

DISCUSSION

This work extends the literature on giving and taking framing in dictator games. Giving/taking framing is comparable to valence framing (Bizer & Petty, 2005), when the difficulty of persuading a person depends on whether the preferences are expressed in terms of supporting something or in terms of opposing something. The current study specifically investigates these framing effects in a developing country context and in a group of young adults, using the social-discounting rate as a summary quantitative measure of altruism (Buddiga & Locey, 2021) as opposed to comparing altruistic choices in the giving and taking frame at individual social distances, which represents its most distinct feature. This results of this study demonstrate a significant effect for giving versus taking framing, which is robust to how the discounting function is modeled. More specifically, participants exhibit greater altruism under the taking than under the giving frame, a result that is similar to that reported by Kench and Niman (2010), Korenok et al. (2014), and Visser and Roelofs (2011), who found that, on average, the payoff to recipients increases with the introduction of the taking option. Related evidence suggests that this result could be explained by aversion to taking due to the moral cost of taking exceeding the moral cost of not giving (Korenok et al., 2018; Levitt &

List, 2007) or reluctant altruism (Klinowski, 2018). In one study, aversion to taking was strongly prevalent, with 85% of participants choosing the giving over the taking game where the two had identical payoff possibilities. In fact, participants, on average, were willing to sacrifice more than 31% of their endowment to avoid taking (Korenok et al., 2018). In turn, Zhao et al. (2018) found evidence that the "do-no-harm" principle is more strongly associated with the taking frame than with the giving frame as far as personality traits are concerned. A similar result was reported by Perera et al. (2016)—that is, people are more altruistic in the taking frame because they are generally averse to harming others.

Our results in part mirror the finding reported in Alt et al. (2018). Although the authors attribute their findings to differences in the social norms that may influence decisions in alternate task frames, they do not offer a more detailed exposition that would explain their result. We go some way toward doing so, having found that it is the greater prevalence of egalitarianism at greater social distances in the taking frame together with the greater extent of selflessness across the task frames, particularly at greater social distances, that underlie the significant differences in social discounting. Jakiela (2013) also reported not taking to exceed giving by a statistically significant margin (but in a nonstrategic environment) and likewise found egalitarianism to be statistically significantly greater in the taking than in the giving frame in a sample of university applicants who were completing a Graduate Record Exam. Similarly, Krupka and Weber (2013) found equally split allocations to be more attractive in their "bully" (give or take) game than in the standard dictator game. Yet, taking more than half of the recipient's endowment was reported as being highly inappropriate on social grounds. In fact, Kimbrough and Vostroknutov (2016) found the norm of equal division in the dictator game to be highly socially appropriate. However, different designs are required to separate the roles of self-interest and inequality aversion, and reciprocity for that matter (Fiedler et al., 2011), in explaining giving and taking in relation to social connectedness. Robson (2021) offers a theoretical, experimental, and analytical approach that may be usefully extended to investigate dictator game decisions in a giving and taking frame.

An important concern in relation to the limitations of our study is that the findings we report here may be a function of the specific social context. The experiment was conducted in a single community, rendering it homogenous with respect to geography, being conducted with a group of participants who are also relatively homogeneous in nature in terms of age (within a narrow age range of 18–24), employment status (being mostly unemployed), education (predominantly having some form of secondary education), and marital status (being mainly single). This raises concerns regarding the wider generalization of our results, arguing in favor of further studies being conducted in more diverse social settings to unravel the complexities of how the moral costs of giving and taking play out in relation to human altruism.

Our study adopts a heavy frame in labeling the name and actions in the game as "taking" rather than more neutrally as "transferring." Although Dreber et al. (2013) found that such a difference in labels does not affect transfers, such an explanation cannot be ruled out in our study. In other words, participants may have perceived the labels as normative and thus may have exhibited different behaviors. In other studies of social preferences, such as the linear public goods game, where a giving versus taking framing was applied, this framing was shown to influence attitudes, beliefs, moral judgements, free-riders proportions, and misperceptions (see for instance, Cartwright, 2016). If indeed it is a moral cost effect that (partly) explains our result, then it is also important to point out that such moral costs are not only context dependent but also vary with the features of the choice problem (Cox et al., 2016). Therefore, the framing effects that were observed in the current study need further investigation because similar studies have not been conducted elsewhere. Such studies should include posttask questions on the participant's specific motivations for their experimental choices (Aguiar et al., 2008) and the alternative choices' moral or social appropriateness (Kimbrough & Vostroknutov, 2016; Krupka & Weber, 2013; Law et al., 2022) so as to reveal the arguments behind participants' varied choices in giving and taking from socially close others as opposed to socially distant others. Alternatively, experimenters may adopt an approach like that followed by Aguiar et al. (2008) in which participants are provided with information regarding the relative deservedness of different recipients, thus adding a moral frame to the choice task, but vary this randomly at different social distances. Yet another alternative is the approach followed by Cox et al. (2016) in which moral reference points are introduced exogenously by varying the initial endowments of participants but preserving the feasible set of allocations. Such work is necessary to absolve the experimenter of the need to merely speculate as to the real reasons for a dictator's choices in giving and taking tasks (Aguiar et al., 2008).

It is also important to note that the social-discounting procedure that was used in this study poses a challenge to whether the ranking of recipients is absolute or relative because it depends on the size of the participant's network of friends or relatives. Social distance measures the degree of closeness between two people. Although various factors may influence this perceived social distance, with some studies measuring relationship, relation, and relationship closeness (Booysen et al., 2018), the current study's focus is not on exploring who occupies what position on this social distance ladder. Thus, no relational information was collected for the listed recipients at different social distances, so we could not control for these relative differences between recipients and the arbitrary nature of the social distance ladder. Further studies that collect such detail may add nuance in the analysis because the experimenter can infer whether the ranking is in absolute or relative terms. Such information is also

critical insofar as it provides the context within which to interpret the result. In fact, as Aguiar et al. (2008) points out, it is the recipient's state of well-being rather than personal closeness or social distance to the recipient that is the critical factor in dictator behavior when invoking the concept of moral as opposed to social distance, where moral distance is the "degree of moral obligation that the dictator has towards the recipient" (Aguiar et al., 2008). In the poor community in which we carried out our study, all recipients' relative well-being most likely is low, which may also explain why participants gave less than what they failed to take. Equally important is inequality (Bechtel et al., 2018). In conditions of widespread poverty, such as in this community, even a small hypothetical endowment may put the participant in the frame of mind of a situation of advantageous inequality (the self as richer) rather than disadvantageous inequality (the self as poorer); for example, Bechtel et al. (2018) showed giving to be more prevalent than taking. In our study, however, advantageous inequality, the former, may be more likely, which may have resulted in the opposite, with the endowment not taken exceeding the endowment given insofar as participants may not have wanted to further impoverish others.

Furthermore, we cannot completely rule out the possibility that our results are an artifact of experimenter-demand effects (Bardsley, 2008) or of conversational implicatures (Hilton, 1995), although we did match interviewers and respondents on gender and race and approximate age and we did train interviewers to exclusively stick to the script provided in the instrument. House money effects may also influence the results of dictator behavior in giving and taking experiments (Kench & Niman, 2010).

CONCLUSION

We conjectured that there is a difference between the social-discounting rate for the giving frame and that for the taking frame due to various moral costs associated with framing. Our research shows that young adults from a non-WEIRD society in a poor informal settlement in South Africa behave differently under isomorphically equivalent designs for the taking and giving dictator game. In general, equivalence in giving and taking is not the norm, it seems, partly due to differences in inequality aversion and selflessness across the task frames. More research, including laboratory and field experiments, is required to uncover the mechanisms through which such behavior operates, inclusive of different socioenvironmental contexts in which the extent of poverty and inequality in communities are varied, either experimentally or by choice of field setting.

AUTHOR CONTRIBUTIONS

Frederik Booysen (FB) and Sevias Guvuriro (SG) jointly conceived the study and designed the experiment. SG conducted the experiments. FB, SG and Herkulaas Morkel van Eyssen Combrink (HC) collaborated on data analysis and interpretation of results. FB wrote the initial draft of the manuscript, which then SG critically revised together with HC. All the authors approved the final version of the manuscript. While FB was responsible for securing of research funding, both FB and SG shared the responsibility for project administration. All three authors are equally accountable for all aspects of the work and its integrity.

CONFLICT OF INTEREST STATEMENT

The authors declare no conflicts of interest.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are openly available in Mendeley data at 10.17632/mmtmsmv4wy.3.

ETHICS APPROVAL

Ethical clearance for the study was obtained from the University of the Free State's Faculty of Economic and Management Sciences (UFS-HSD2018/1397). Written informed consent was obtained from all study participants and participation in the study was voluntary.

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