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Generosity and livelihoods: Dictator game evidence on the multidimensional nature of sharing among the Kenyan Maasai

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Abstract

This paper investigates whether sharing behavior is multidimensional and embedded in social organization and modes of economic production. It uses a modified dictator game varying social distance to the recipient and varying the resource (money vs. six in-kind resources) being shared among the pastoral Maasai of Kenya. Results show that both social distance and the nature of the resource matter for sharing as well as their combination. The discussion argues that these findings are consistent with the nature and role of these resources in the pastoral livelihood among the Maasai.

KEYWORDS
dictator game, generosity, Kenya, livelihood resources, sharing, social distance

> "Not what we give, but what we share,--For the gift without the giver is bare"—James Russell Lowel

1 | INTRODUCTION

A large body of research supports the common-sense observation that people are not only motivated by self-interest but also display pro-social behavior (Güth, Schmittberger, & Schwarze, 1982; Kahneman, Knetsch, and Thaler, 1986; Fehr & Schmidt, 1999; Fehr & Fischbacher, 2002; Fehr & Fischbacher, 2003; Henrich et al., 2005; Engel, 2011). For example, a meta-study covering 129 publications and 616 dictator game (DG) sharing results—one of the most commonly used ways to measure pro-sociality in which a participant has the opportunity to share part of a monetary endowment with a recipient—shows that an overwhelming number of subjects across ages, societies, and socioeconomic contexts give a positive amount to the recipient (Engel, 2011).

However, most of these studies using DG results to assess pro-social behavior are conducted in Western, educated, industrialized, rich, and democratic (WEIRD) societies. Tellingly, a review determined that 96% of participants in published major psychology articles came from WEIRD countries, yet only 12% of the world population live in these countries (Arnett, 2008; Henrich, Heine, & Norenzayan, 2010). This raises the question in how far the current research on pro-sociality and its putative evolution in WEIRD countries is representative for the entire world population. In an important move, recent studies have begun to explore how pro-sociality has evolved with economic development over human history, in particular the transformation away from reciprocal economies predicted to arise from increased market exposure and integration. This is done by comparing contemporary pro-social behavior across different WEIRD and non-WEIRD societies (e.g., Cardenas & Carpenter, 2008; Engel, 2011; Ensminger, 2004; Henrich et al., 2005; Henrich et al., 2010; Henrich, Heine, & Norenzayan, 2010). Another recent interest has been to explore if generosity in non-WEIRD settings sustains collective action in the context of community-based natural resource management efforts and community-driven development more broadly (e.g., Nguyen & Rieger, 2017). The goal of this study is to contribute to this growing literature on the dynamics of sharing behavior in non-WEIRD

countries by exploring two potentially important dimensions moderating pro-sociality: (a) the social distance between donor and recipient and (b) the nature of the good (money vs. in-kind goods) being shared. This paper posits that both dimensions—social distance and nature of the good, as well as their interaction—matter for sharing in the sense that the division of resources depends on (a) how socially close a donor feels to the recipient and (b) whether there is a good-dependent cultural norm of sharing, as is often the case with in-kind goods but may also apply to money.

Our first hypothesis that social distance matters in sharing behavior is motivated by the observation that people are not equally generous to everyone alike; they have a higher tendency to help others if they care for them and feel close to them. Several studies have shown that generosity decreases hyperbolically as a function of social distance, that is, how much a donor cares about the recipient (Goeree, McConnell, Mitchell, Tromp, & Yariv, 2010; Jones & Rachlin, 2006; Strombach et al., 2014; Strombach et al., 2015). The diminution of generosity across social distance has been dubbed as social discounting (Jones & Rachlin, 2006). In a series of studies using variants of the DG, hyperbolic social discounting has been observed in subjects from different socioeconomic backgrounds, including participants in Germany (Margittai et al., 2015; Margittai, Van Wingerden, Schnitzler, Joels, & Kalenscher, 2018; Strombach et al., 2015), the United States of America (Jones & Rachlin, 2006; Rachlin and Jones, 2008; Goeree et al., 2010), and China (Strombach et al., 2014). We speculate that the nature of the dyadic interaction, as measured by social distance, is of equal or even higher importance in communities that rely on well-defined categories of social relations to allocate and access resources, such as semi-nomadic, pastoral societies of Eastern Africa. We expect that the propensity for cooperative and sharing behavior varies with social distance in these societies because individuals at close social distances are likely to live in close spatial and temporal proximity and thus directly share (and manage) certain common pool resources on a daily basis, but such day-to-day interdependencies are much less applicable with socially remote individuals.

Regarding our second hypothesis that the nature of the resource matters in sharing behavior, there is, to the best of our knowledge, no DG evidence that explores this dimension for pro-social behavior. Some scholars—especially (but not exclusively) anthropologists studying non-Western societies—have long argued that money, like material goods, is importantly embedded in a social and cultural context, which structures its use and its particular value, in ways that may impact pro-social behavior (e.g., DeVoe & Iyengar, 2010; Ferguson, 1990; Hutchinson, 1992; Shipton, 1989).

To explore our hypotheses, we modify the DG and investigate sharing behavior in a non-Western setting, namely, the pastoral Maasai of Southern Kenya. This is an appropriate setting because despite recent social and economic change, the Maasai in this region maintain pastoralism as a primary livelihood strategy and with it a complex social system that has traditionally included good and relational-specific norms around resource sharing. However, the traditional pastoral livelihood, with it their social system of resource sharing, faces considerable new pressures from population growth, land privatization, climate change, economic diversification, migration, urbanization, and formal education, among other forces. As the Maasai become increasingly more integrated socially, economically, and politically in the national and even international arena, that is, as they become more WEIRD, their sharing norms and expectations may be changing.

The results of our DG experiment confirm both of our hypotheses. Social distance does matter in sharing behaviors among the Maasai, and social discounting is present for all resource types. Interestingly, we see the presence and significance of newer forms of social networks, such as church groups, as well as the continued importance of traditional social affiliations despite various forms of integration. We also find that the nature of the good matters, reflecting important and persistent good and relational-specific norms around resource sharing.

2 | SETTING

The pastoral Maasai of Kenya inhabit the semi-arid rangelands of Southern Kenya, where the rain is sparse throughout much of the year and variable during periods of rain. In such an environment, livestock mobility is key to the success of the livelihood. Historically, the mobility of people and herds across this landscape has been facilitated by an elaborate system of social organization coupled with collective land holdings. Access to pasture and water resources were managed through sectional membership, clan identity, age-set association, and kinship ties and were based on norms of reciprocity and social obligation. The typical residence pattern was a large homestead composed of multiple families who relied on one another for resource access and labor pooling. The late colonial period (1950s) formalized these arrangements in the establishment of formal collective land holdings under a group ranch model (Galaty, 2013). Although this system of tenure experienced many challenges, it did help retain strong norms and expectations around resource sharing, particularly of grazing and water. Importantly, however, the ethic of sharing extends beyond an economic/livelihood imperative in an ecologically uncertain environment. For the Maasai, it is a fundamental human virtue—one that centrally defines and distinguishes humanity from the rest of the animal world. "For the Maasai, being 'human'—being a person—is to live communally with other people in residence groups where sharing, generosity, and cooperation are virtues of the highest degree. Extensive gift-giving and exchanges of livestock and livestock products are part of this cultural complex" (Talle, 1990:76). Each good has its place in this "cultural complex" roughly divided into public/communal goods, like grass and water, which are readily shared, and private goods, like livestock and livestock products, which are more regulated and exchanged in particular ways. Milk, for example, a staple in the Maasai diet, is a private household good, often hidden and to some extent hoarded to ensure the availability for the family and visitors. Asking for milk from others is a sign of poverty. By contrast, an animal that is slaughtered for meat always meets its fate in the public eye, outside the home, and is eaten in a collective celebration. Private meat consumption is really only practiced with purchased meat from a butcher,

an adaptation or accommodation made possible by the recent prevalence of market integration.

Over the past decade, however, various dynamics have put pressure on the system of collective land holdings and associated social organization that has been an integral part of the pastoral Maasai. These dynamics include population growth, privatization and commodification of communal land, climatic instability, and economic development in Kenya as a whole. Most families now pursue pastoralism alongside other livelihood activities (Archambault, 2014; Homewood, Kristjanson, & Trench, 2009).

3 | RESEARCH DESIGN

3.1 | Sampling and recruitment

The DGs were conducted among a sample of the population living in three contiguous Maasai communities in the Southern Kenyan rangelands: Elangata Wuas, Kilonito, and Torosei.[1] Together, the communities cover an area of approximately 1,300 km^2 with a population estimated in 2008 of approximately 20,000 residents (Archambault, 2014). Specifically, the DG was conducted from May to August 2010 with a random sample of 314 adults (139 men and 175 women). The DG were conducted in private at people's homes with only the respondents present. Table 1 shows the summary statistics for this sample: Respondents were on average 43 years old, with large families (6 children), few were literate (27%), and a minority had a cash income generating activity (31%).

TABLE 1 Summary statistics

Variables	Mean	SD	Observations
Women	0.56	0.50	305
Maasai	0.96	0.19	260
Age	43.36	14.29	252
Number of children	6.23	3.31	248
Literate	0.27	0.44	260
Years of education	2.59	4.14	250
Income-generating activity	0.31	0.47	260
Monthly earnings (average KSh)	2,445	10,919	252

Notes. $1 US = 74 KSh (approximately).
Abbreviations: KSh, Kenyan shillings *SD*, standard deviation.

3.2 | Dictator game modifications

In the standard DG, a participant, dubbed the dictator, is endowed with a sum of money, and she can decide to split her endowment between her and an anonymous recipient. The dictator determines the fraction shared, or whether she wants to share at all. The recipient has to accept the dictator's offer and cannot reciprocate or respond to the offer. Here, the standard DG was modified in several ways in response to the challenges in measuring social discounting in cross-cultural research identified (Hruschka, Munira, Jesmin, Hackman, & Tiokhin, 2018), including variability in numeracy skills, in local, idiosyncratic, and culture-specific norms and customs, especially when construing social distance, and the need for concreteness of the instructions and task manipulations. First, the DG was not conducted with *one* anonymous recipient as is usual, but rather with recipients from 20 pre-defined social categories in repeated rounds of the game (see Table 4 for details on the social categories, and supporting information for justification). These 20 social categories were created on the basis of existing socio-spatial units (the lineage system of clanship and the age-set system), as well as more recently established forms of social alliances such as church groups.[2] Participants were first asked to assess how close they felt to each of these 20 pre-defined social categories by ranking them from 1 (socially closest) to 20 (socially most distant). Next, in order to obtain an additional interval-scaled measure of social distance, they were asked to place markers for each of these 20 categories on a 100-cm ruler, with 1 representing being *socially very close* and 100 being *socially very far*. Importantly, our ruler-based social distance elicitation metric made no assumptions on our participants' numeracy skills as social distance estimates were obtained on the basis of their visual placement abilities only (see Supporting information for details).

Second, the standard DG was modified by assessing sharing behavior of six in-kind resources alongside money. The six in-kind resources used were (a) grass, (b) water, (c) cattle, (d) milk, (e) children's labor time herding animals, and (f) charcoal. These resources were chosen because they can be expressed in monetary terms as they are readily purchased and sold at local markets (with the exception of children herding[3]) and because they are central in the pastoral economy. Specifically, they provide variation along two different dimensions that we hypothesized shape norms around sharing livelihood resources for the Maasai. The first is the degree to which a resource has historically been considered communal/collective. Roughly categorizing, grass and water have long been considered collective, whereas, milk, cattle, and charcoal more private. We hypothesized that resources with a collective history would be more easily shared. Money and child work, on the other hand, fall less clearly onto this spectrum. Money, for example, although privately earned, also has strong sharing norms associated with it as discussed below. Child work, although private in that it falls within the decision authority of parents, is also shared with others: children herding animals of relatives.

A second dimension is that of status, in other words, the extent to which a good is prestigious versus taboo. Cattle, grass, water, milk,

[1]The Maasai and Samburu (a close relative to the Maasai) have been subject to several experimental game studies, including the dictator game. This retained money as the medium of exchange in relation to an anonymous peer group is defined as someone in the players' community (pp. 21–23).

[2]The relatively recent rise in popularity of Christianity among the Maasai, and especially among Maasai women, has been well documented (Hodgson, 2005).

[3]There is not a market for children's time herding cattle or goats, but there is a market for its substitute—hiring a herdsman.

and money carry considerable prestige within Maasai society, whereas charcoal and child herding labor is taboo and, to some extent, illegal. Charcoal preparation in this region has been unsustainable exploitative. Child herding is illegal if it interferes with schooling and/or other aspects of a child's development. We presumed that taboo goods would be less easily shared.

To keep the implementation of the DG manageable, each participant was offered the opportunity to share three out of the seven resources: money (all participants) and two of the six in-kind resources, the latter drawn randomly. The order in which the three DGs were played (money and the two selected in-kind resources) was also random. Table 2 shows that the proportion of respondents that within 1 year prior to the survey had sold or paid for specific resources. These proportions varied between 8%–34% (purchased) and 7%–49% (sold) of respondents.

To ensure comparable stakes across resource sharing, each DG participant was endowed with the same market value—approximately 2,000 KSh ($22 US)—for each resource. We opted for a market value of approximately 2,000 KSh per resource because it is roughly the equivalent of a half-month casual labor wage at the time of the study. The exceptions were cows because it is not divisible in units amounting to 2,000 KSh. For logistical reasons and consistency across all resources (including money), the DGs used laminated pictures depicting (denominations of) actual resources (see Table 3). For example, for money, these depicted actual Kenyan currency notes in denominations of 500 KSh and 100 KSh. Similarly, there were ten cards depicting a local breed of cow in good health. For a resource such as milk where we needed to play with a total of 100 L, we broke the allocation unit into 10 L of milk and used picture cards showing a woman carrying a container to store milk, and we indicated how full this container would be with 10 liters of milk.

TABLE 2 Proportion of respondents purchased/sold resources

Resource	Purchased (%)	Sold (%)
Cows	0.24	0.49
Grass	0.25	0.07
Water	0.34	0.08
Charcoal	0.08	0.28
Milk	0.22	0.11
Child herding	0.26	0.09

TABLE 3 Resources used in the dictator game

Resource	Rounded total game value	Units for allocation
Money (KSh)	2,000	2 × 500 and 10 × 100
Grassland (days)	20	20 × 1
Water (weeks)	20	10 × 2
Cattle	10 cows	10 × 1 cows
Milk (L)	100	10 × 10
Child work (days)	20	20 × 1
Charcoal (kg)	300	10 × 30

Abbreviation: KSh, Kenyan shillings.

3.3 | Framing and procedures

In the DG used here, in each round of the game, participants were endowed with cards depicting the initial sum of money or the (equivalent) initial stack of resources. They were then asked how much of their endowment/units of resources they would share with individuals on variable social distance levels (see Supporting information for details).

As described earlier, money was played by all participants, and each participant was also asked to play with two additional randomly chosen resources. For each medium of exchange, the DG game was then repeated for those social categories that had initially been ranked by the participant as 1, 2, 4, 8, 12, 16, and 20. In total, each participant played 21 games. The order of play with the different social categories was randomly determined by shuffling the markers and playing in the order they emerged.

The DG script (see Supporting online information) stressed anonymity; neither the dictator nor the recipient would know one another. In order to make the script as realistic as possible, respondents were explicitly told that the money they received as dictators had been earned from work that they had done (as opposed to gifted by a foreign researcher). For obvious ethical (e.g., child work) and practical reasons, it was not possible to incentivize our task. Even though we appreciate the value of full incentive compatibility, a large body of evidence in behavioral economics, psychology, and cognitive neuroscience reveals a striking congruence in the mental mechanisms involved in processing real and hypothetical monetary gains (Bickel, Pitcock, Yi, & Angtuaco, 2009; Hinvest, Bradshaw, & Anderson, 2005; Johnson & Bickel, 2002; Lagorio & Madden, 2005; Madden et al., 2004; Madden, Begotka, Raiff, & Kastern, 2003; Whelan & McHugh, 2009). In addition, a meta-review of DG results by Engel (2011) finds that the use of a hypothetical scenario—employed in 22% of all treatments—is not significantly different from incentivized stakes in meta-regression and when using individual data. We therefore maintain that our results provide meaningful scientific insights despite the non-incentivized nature of the task.

All data and analysis scripts can be downloaded from a public data repository: https://osf.io/pv5hd/

4 | RESULTS

4.1 | Ranking of social categories

First, the ranking and ratings results of social categories are shown in Table 4.[4]

[4]Supporting information presents 20 figures showing the distribution of ratings assigned by the respondents for each of the 20 social categories, sorted from the most (on average) socially close category (a close family member or blood relative) to the most (on average) socially distant category (a foreigner).

TABLE 4 Distance ranking and rating of social categories

Rank	20 Social categories	Average rank	Average social distance
1	A close family member or blood relative	1.68 (0.14)	4.43 (0.71)
2	Close friend	3.21 (0.11)	8.66 (0.47)
3	Clanmates from this group ranch	4.07 (0.12)	13.23 (0.68)
4	Age-mate from this group ranch	5.60 (0.16)	20.15 (0.94)
5	A member of your church/religious group	6.25 (0.25)	21.03 (1.21)
6	Fire-stick elder from this group ranch	6.97 (0.17)	23.73 (0.92)
7	Clanmates from a different group ranch but same Maasai section	7.44 (0.15)	27.66 (0.99)
8	Someone from the age-set above yours from this group ranch	8.41 (0.18)	29.71 (0.98)
9	Age-mate from a different group ranch but same section	8.69 (0.14)	32.96 (1.05)
10	Clanmates from a different group ranch and different section	10.16 (0.16)	38.82 (1.11)
11	Age-mate from a different group ranch and different section	11.22 (0.15)	42.71 (1.09)
12	A person from a different denomination	11.31 (0.26)	42.77 (1.40)
13	A Kalenjin from this group ranch	13.10 (0.18)	53.28 (1.42)
14	A Kenyan Maasai from outside this Maasai section	13.32 (0.13)	51.24 (1.20)
15	Non-Maasai and non-Kalenjin from this group ranch	14.22 (0.19)	58.77 (1.46)
16	A Maasai from Tanzania	15.12 (0.14)	59.23 (1.32)
17	A Kalenjin from a different group ranch, but within Kenya	16.66 (0.13)	69.79 (1.46)
18	Non-Maasai and non-Kalenjin from a different group	17.02 (0.13)	72.15 (1.40)
19	A person from a different religion	17.49 (0.18)	77.39 (1.49)
20	A foreigner	17.69 (0.23)	78.46 (1.68)

These rankings underscore the persistence of Maasai traditional social organization. The social nucleus contains kin and affines (family—ranked first) and extends out first to close friends (ranked second), then to clanmates, then to people from the same age set (so-called age-mates), then to co-ethnics (Maasai), and then to bonds of citizenship (Kenyans vs. foreigners). These rankings also show a strong link between geography and social connections. For example, although clanmates are generally ranked higher than age-mates, an age-mate *from this group ranch* is ranked higher than a clanmate *from a different group ranch*. The social categories ranked 1 through 8 roughly constitute social units residing in close physical proximity to one another (a shared group ranch). Finally, the high ranking (rank fifth) of churchmates underscores how Maasai have incorporated more recent alliances.

4.2 | Sharing by social distance and resource

Table 5 presents the mean sharing values across social distance and resources. The top line is for milk, which had the lowest average sharing across all ranks (10.5%), to grass at the bottom, which had the highest average sharing across all ranks (18.7%). In terms of average sharing, the table shows that milk, cows, and charcoal are all on the lower end (10.5%–11.7%) compared with water, money, child work, and grass (16.6%–18.7%). The gaps are largest (17.6%–32.3%) for those socially closest, Rank 1, and the gaps decline with social distance. Note that sharing levels for grass are just as high towards people that are socially farthest (Ranks 16 and 20: essentially strangers) as milk and cows are shared with those socially very close (Ranks 2 and 4, friends or clanmates from this community). Focusing on money, the sharing average for Rank 4 is 16.5%. Rank 4 corresponds (on average) to an age-mate from this group ranch, which is comparable with recipients in a standard DG, which is often an anonymous member of the same social group (e.g., a classmate or community member). This is below the average giving in Engel's, 2011 meta-analysis of 616 treatments, 28.4%. However, it is still a common average share found in other studies, as the distribution of sharing means in the meta-analysis is left-skewed (Engel, 2011, p. 588). One contributing factor to this relatively lower level of average sharing may be the fact that respondents were told that they had *earned* the resources through work. Engel's, 2011 meta-analysis shows that whether resources are earned is associated with among the largest negative declines in sharing—by one-third relative to the regression intercept (Engel, 2011, p. 20). Furthermore, the hypothetical stakes in our study were $22 US, similar to the average stakes in Engel's, 2011 meta-analysis (Engel, 2011, p. 10). But because this latter average is based on studies that were by and large conducted in rich countries (87% of all treatments in the meta-analysis), the stakes in those studies constitute a much smaller share of consumption to the dictator than in the case of the Maasai. The relatively high hypothetical stakes may have also reduced sharing below the mean observed in the meta-analysis. In support of this possibility, a recent meta-analysis (Larney, Rotella and Barclay, 2019) revealed that, as stake size increases in the dictator game, people transfer less to others, including socially close others.

Figure 1 plots the sharing values from Table 5, including the 95% confidence interval around these values.

TABLE 5 Average sharing results by rank

Resource	Overall mean (%)	Rank (%)						
		1	2	4	8	12	16	20
Milk	10.5	17.6	13.5	11.3	9.9	8.0	6.7	6.9
Cows	11.3	16.9	13.2	11.0	10.0	8.9	8.5	10.5
Charcoal	11.7	19.6	15.7	12.9	10.4	9.0	7.2	7.3
Water	16.6	25.0	20.5	16.5	15.5	13.4	12.4	13.0
Money	16.9	28.2	21.9	16.4	14.5	13.4	11.2	12.3
Child work	17.5	28.5	22.2	18.7	15.2	14.3	11.6	11.5
Grass	18.7	32.3	24.9	18.9	16.1	13.1	11.1	14.3

We next assess if the differences in sharing behavior across resources and across social distances observed in Figure 1 are also statistically significant. To do so, we perform two sets of regression estimations. First, a set of basic estimations (Equation (1)) was performed separately for each resource where generosity toward the specific resource is the dependent variable and social distance (including its square) is the main independent variable:

$$\theta_{ijz} = \beta f(SD_z) + \alpha_i + u_{ijz} \quad (1)$$

Second, estimations (Equation (2)) that pool the data across all the resources were performed to test explicitly whether sharing of one resource is significantly different from sharing of another resource, including as a function of social distance. In these estimations, money is the left-out dummy variable and thus becomes the comparison resource. Again, generosity toward the specific resource is the dependent variable and social distance (including its square) as well as the specific resources, including their interaction, are the main independent variables:

$$\theta_{ijz} = \beta f(SD_z) + \delta_j R_j + \gamma_j f(SD_z)^* R_j + \alpha_i + u_{ijz} \quad (2)$$

Tables 6 and 7 present the results for Equations (1) and (2), respectively. In both estimations, *i* identifies the respondent, *j* the specific resource, and *z* the specific social distance ranking or rating. θ_{ijz} is the proportion shared (measured between 0 and 1) by individual *i* with regard to resource *j* when faced with a recipient of social rank *z*. The coefficient vector β captures the relation between social distance and generosity, δ_j captures how generous respondents are with resource *j* relative to money (the omitted category), and γ_j captures any interaction effect between social distance and the particular resource, again relative to money. Consistent with Figure 1, we include square terms of social distance to account for non-linear effects. To improve efficiency, each estimation can include individual fixed effects (α_i) because there are multiple observations for each respondent (sharing responses to three resources, each for seven rank measures).[5] Hence, these regression estimation findings on sharing capture differences in how a given respondent played one resource relative to another resource (and one social category compared with another) and not due to differences in individual background characteristics between respondents that may systematically affect how much they share different resources. We ran regressions for social distance rankings and distance ratings separately.

Table 6 shows that the relation between social distance and sharing is convex for each of the resources: Sharing declines with social distance (the negative coefficients on "rank") but flattens out (the positive coefficients on "rank squared"). The (absolute) size of the coefficient estimates on "rank" tends to be higher for the resources that are shared less than the resources that are shared more. For example: −1.339 is the coefficient estimate on social distance for milk versus −3.003 for grass. Although the reverse is the case for the coefficient estimates of the square terms, it suggests convergence.

Note that the total number of observations across all the columns of Table 6 sums to 6,364. Table 7 pools all these sharing data across the different resources. Columns 1 and 2 of Table 7 use the rank measure of social distance (from 1 to 20) and Columns 3 and 4 use the rating measure of social distance (from 0 to 1). Table 7 confirms that resources are shared differently, including across social distance.

First, sharing depends importantly on the specific resource. As shown by Columns 1 and 3, Maasai are more generous with grass than with money ($p < .05$), but less generous with water than with money ($p < .05$), and especially less generous with cows ($p = .01$), milk ($p < .01$), and charcoal ($p < .01$). For example, Column 3 predicts that, relative to money, Maasai are 1.5 percentage points (equivalent to a 6.4% change in sharing relative to the mean sharing) more generous with grass than with money, and 6.0 percentage points (equivalent to 25.8% change relative to the mean) less generous with milk than with money.

Second, sharing also depends importantly on the social category–resource combination. This is shown by the interaction terms between resources and social distance (and its square) in Columns 2 and 4. In particular, although milk, cows, and charcoal are overall shared less than money, the significant interaction terms show that the decline with social distance is much less pronounced. Only for child herding is there no significant difference with money. The result patterns are identical between social distance rank and rating measures. This finding raises the question whether this is due to a genuine interaction between resource and social discounting or due to an overall floor effect that is reached at higher ranks. As shown in Table 5, there is not one overall floor effect across the resources, but sharing "floors" are actually lower for milk, cows, and charcoal on the one hand (varying between 6.7% and 8.5% for Rank 16) than for water, money, child work, and cows on the other (varying between 11.1% and 12.4% for Rank 16). This further supports the notion that the interaction between resource and social discounting is indeed real.

Figure 2 shows the predicted difference in sharing between money and each resource, by social rank, based on the coefficient estimates ($p < .05$) from Table 7, Column 2. For example, the predicted difference in sharing between money and child work is 0 for all values of social distance because none of the child work coefficient estimates in Column 2 are significantly different from zero (at $p < .05$). The predicted difference between money and water is −3.67 percentage points for all values of social distance because only the coefficient estimate on the water dummy in Column 2 is significantly different (at $p < .05$) and not its interactions with social distance. On the other hand, the predicted difference in sharing between grass (as well as cows, milk, and charcoal) and money is non-linear: The sharing gap is largest when the social distance to the recipient is small, and this difference declines significantly at $p < .05$ as the recipient is socially further removed.

[5]Alternatively, the fixed effects can be modeled as random effects. The results are statistically identical, as would be expected, as each participant was asked the sharing amount for the seven selected ranks, whose order was random, and, in addition to sharing of money, for two randomly selected resources.

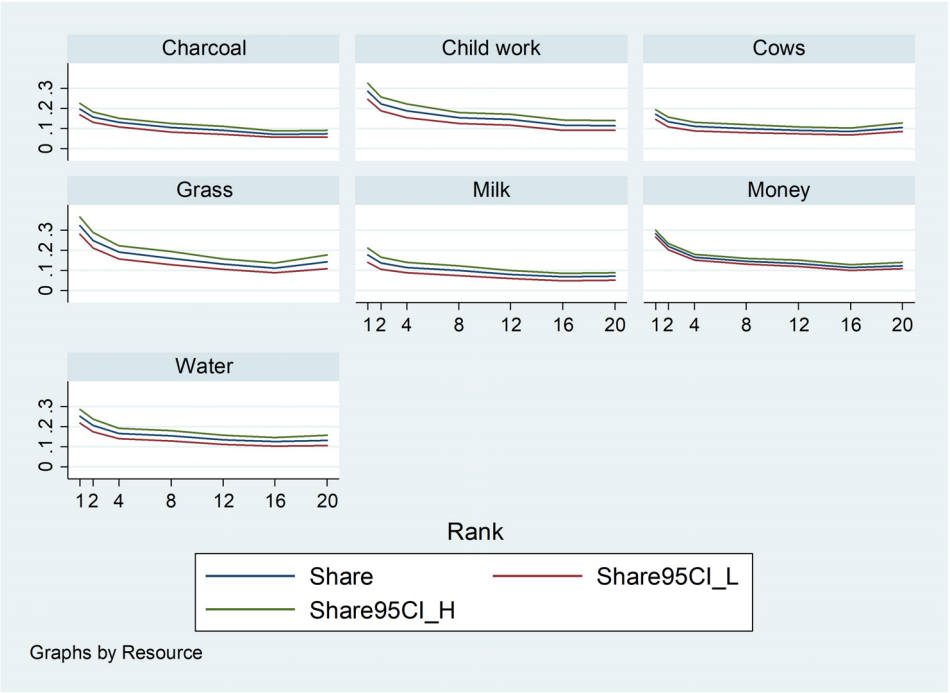

FIGURE 1 The (actual) proportion shared by resource and by rank. Mean fraction of goods shared as a function of social distance rank (± upper and lower bounds of the confidence interval, CI) [Colour figure can be viewed at wileyonlinelibrary.com]

5 | DISCUSSION AND CONCLUSION

Our DG findings underscore the multidimensional nature of sharing among the Maasai, with a strong presence of good- and relational-specific norms around resource sharing. That money occupies a place of its own in the cultural complex of sharing is consistent with the argument that "money" matters (e.g., Hutchinson, 1992; Shipton, 1989).

With regard to social distance, we could replicate in a non-WEIRD population (the Kenyan Maasai) previous social discounting studies with WEIRD samples (Jones & Rachlin, 2006; Strombach et al., 2014, 2015; Goeree et al. 2010; Margittai et al., 2015, 2018) that generosity towards others declines across social distance. Our social discounting results are consistent with those obtained from other non-WEIRD populations, including Indian (Hackmann, Danvers & Hruschka, 2015), Singaporean (Pornpattananangkul et al., 2017), and Banghadeshi participants (Hruschka et al., 2018), but they extended previous results by the observation that social discounting was not uniform across all goods and commodities. Some resources like grass and money are more readily shared than other resources such as milk and cows *between people considered socially close*. Intuitively, sharing declines with social distance across all resources. However, the results show that the *differences* in sharing between resources also declines with social distance; the largest sharing differences between resources are among social categories that are close (Ranks 1 through 8), and there is little difference in sharing across the different resources for social distance Ranks 9 and higher. Thus, this pattern resembles the hyperbolic shape of the social discount function typically found in Western and Chinese participants, too (Jones & Rachlin, 2006; Strombach et al., 2014, 2015). To understand this in the present context, note that Ranks 1 through 8 effectively constitute people living in the same group ranch,[6] and thus directly share (and manage) certain common pool resources on a daily basis, notably grass, whereas others, such as milk and cows, are more privately held with different sharing expectations. Such day-to-day interdependencies around common pool resources are much less applicable with people living outside the group ranch. The fact that different resources are shared differently might be explained by their respective relative value. A recent meta-analysis of the DG (Larney et al., 2019) showed that as the stake size increases, sharing decreases. This would imply that relatively more valued goods would be shared less readily than less valued goods, even if relative valuation is purely subjective. In addition, it is likely that sharing behavior of the different goods is also modulated by social and cultural expectations. What are the sharing expectations?

First, the fact that grass is the most readily shared resource is perhaps not surprising given that it constitutes the core common pool resource that underpins Maasai pastoralism. And, even though the group ranches are undergoing a process of de jure privatization in which group ranch parcels are (or have already been) allocated to group ranch members; the dry and unpredictable rainfall patterns mean that individual parcels are unlikely economically viable by themselves. In this environment, flexible access, and thus sharing of grass, remains an essential component of pastoralism even if land is privately held (Archambault, 2016).

Second, with regard to money, our benchmark resource, the DG shows that money is a relatively "generous" resource among the

[6]The exception is Rank 7: "Clanmates from a different group ranch but same Maasai section."

TABLE 6 Sharing (0%–100%) of resources by social distance

	Milk	Cows	Charcoal	Water	Money	Child work	Grass
Social distance	−1.339	−1.284	−1.496	−1.656	−2.225	−2.012	−3.003
Rank	(0.193)***	(0.145)***	(0.169)***	(0.196)***	(0.127)***	(0.231)***	(0.261)***
Social distance squared	0.043	0.049	0.045	0.055	0.075	0.062	0.107
Rank squared	(0.009)***	(0.007)***	(0.008)***	(0.009)***	(0.006)***	(0.010)***	(0.012)***
Constant	17.211 (0.878)***	16.635 (0.651)***	19.495 (0.738)***	24.569 (0.886)***	27.353 (0.536)***	27.762 (1.073)***	32.177 (1.133)***
R^2	0.72	0.76	0.72	0.73	0.69	0.73	0.71
N	619	776	813	745	2,121	736	554

*p < .1.**p < .05.***p < .01.

TABLE 7 Sharing (0%–100%) relative to money

Variables	Share (0%–100%) social distance Rank (1 thru 20)		Sharing (0%–100%) social distance Rating (0 thru 1)	
Social distance	**−1.906 (0.085)*** **	**−2.225 (0.155)*** **	**−31.703 (1.596)*** **	**−36.3653 (2.8421)*** **
Social distance squared	0.064 (0.004)***	0.075 (0.007)***	20.222 (1.495)***	23.2417 (2.7444)***
Grass	1.546 (0.621)**	4.593 (1.557)***	1.544 (0.635)**	2.9843 (1.3159)**
Water	−1.156 (0.495)**	−3.669 (1.272)***	−1.155 (0.500)**	−2.7837 (0.9991)***
Cows	−4.679 (0.438)***	−9.836 (1.044)***	−4.679 (0.444)***	−7.8945 (0.8425)***
Milk	−6.024 (0.527)***	−9.872 (1.383)***	−6.023 (0.531)***	−8.5262 (1.0807)***
Child work	0.980 (0.543)*	0.772 (1.470)	0.980 (0.547)*	1.1498 (1.1635)
Charcoal	−5.529 (0.471)***	−8.214 (1.169)***	−5.529 (0.474)***	−7.3550 (0.9031)***
Grass × Social distance		−0.783 (0.348)**		−8.8945 (6.3473)
Grass × Social distance squared		0.032 (0.016)*		7.2138 (5.9376)
Water × Social distance		0.562 (0.289)*		8.0279 (5.1400)
Water × Social distance squared		−0.020 (0.013)		−5.0461 (4.8387)
Cows × Social distance		0.943 (0.238)***		15.7306 (4.3838)***
Cows × Social distance squared		−0.026 (0.011)**		−9.5016 (4.1674)**
Milk × Social distance		0.910 (0.303)***		13.3484 (5.4064)**
Milk × Social distance sq.		−0.034 (0.014)**		−9.3159 (5.0524)*
Child work × Social distance		0.230 (0.321)		−1.4068 (5.7056)
Child work × Social distance squared 1		−0.015 (0.014)		1.3881 (5.3214)
Charcoal × Social distance		0.719 (0.269)***		11.3328 (4.8162)**
Charcoal × Social distance squared		−0.030 (0.012)**		−8.9802 (4.5892)*
Constant	25.948 (0.413)***	27.346 (0.629)***	23.255 (0.352)***	24.1829 (0.4991)***
R^2	0.51	0.51	0.50	0.50
N	6,364	6,364	6,364	6,364

Table 7 shows the main estimation results using the rank measure (1, 2, 4, 8, 12, 16, and 20) for the social categories and the rating measure (1–100, re-scaled from 0.01 to 1). Columns 1 (rank) and 3 (rating) show the main effects. The dependent (sharing) variable in each estimation takes values on interval (0–100). OLS regressions include individual fixed effects (303 individuals, fixed effects not shown). Robust standard errors in parentheses. *p < .10.**p < .05.***p < .01.

Maasai. It is more readily shared than the in-kind resources water, cows, milk, and charcoal, and shared equally compared with child work. Grass is the only in-kind resource that the Maasai share more readily than money. Based on our determining dimensions, money generosity was pulled in opposite directions. On the one hand, money is a prestige good, but on the other, it is typically considered a private good. Ferguson's (1990) observation among Lesotho farmers suggests that money may not be as private (excludable) as we assumed. Ferguson argues that money is often in the "domain of contestation" by relatives and friends, unlike cattle. For this reason, wage-earning men in Lesotho prefer to invest their income in cattle and are reluctant to sell these cattle even for amounts above market prices because they offer men more protection as a form of property with far fewer claimants. Qualitative insights from years of work among the Maasai in this study support this notion. Regular wage employment is not common, making money relatively scarce and highly sought after (e.g., to pay for school fees or medical bills). Anticipating this, research assistants for this study commonly requested that their pay be withheld until a later date so that they could more easily save toward a particular purchase without worrying about sharing claims. One assistant would divert his route home on payday so as to avoid passing through a small town center where he would likely meet a higher concentration of potential claimants. And, sharing expectations are especially high

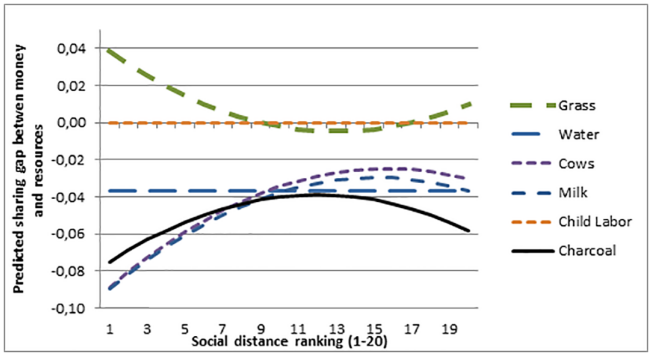

FIGURE 2 The predicted difference in sharing between money and each resource, by social rank. The lines reflect sharing gap predictions between respective resources and money for different social ranks. These predictions are based on the significant coefficient estimates (maximum p < .05) from Table 7, Column 2. [Colour figure can be viewed at wileyonlinelibrary.com]

among extended family and close friends, which could explain why money generosity declines relatively fast with social distance.

Third, the level of sharing of child work was the same as money, both on average and across social distance rankings. This finding was quite surprising, as we had categorized child work as both private and taboo. Children's herding indeed has traditionally been a shared resource in the context of resource pooling within large homesteads, so a collective rather than a private good. However, one might have expected that the recent transition into formal education and the subsequent exposure to powerful children's rights discourses, combined with residential fragmentation, would have decreased the willingness of parents to share child work with others. Nevertheless, it was readily shared in comparison with other goods.

Fourth, water was shared less than money, both on average and across social distances, but shared more than milk, cows, and charcoal, at least among people socially close. That water lies somewhere in the middle when it comes to sharing may reflect that water is in essence a common pool resource but also a complex good because there are private aspects that depend on its source. For example, there are several deep boreholes in the area for which users pay a per liter price in cash. There are also water collection holes that are (privately) dug out of "dry" communal rivers that contain subsurface water and water from large shallow pans dug on de jure private group ranch parcels that collect erratic rainfall.

Fifth, charcoal was among the least readily shared alongside milk and cows. The charcoal result was not surprising given that we categorized it as a private good and taboo. As a result of the recent de jure privatization of group ranch parcels, trees on these parcels have become private property. In the de jure sense, trees are as much private property as the rainfall harvesting water pans built on private parcels. However, unlike decisions around providing access to water to others, decisions around the felling of trees for charcoal is not seen as having immediate consequences for the collective, also making trees de facto private goods. Furthermore, the production of charcoal in this community has a sordid history. As it is taboo for Maasai to cut down entire trees, non-Maasai were often hired in to do the work. Issues around exploitative profit making, unsustainable practices, and social conflict with outsiders have made charcoal a taboo, likely reducing the appetite for sharing.

Finally, the fact that cows and milk are among the least readily shared resources is also not surprising. They are in essence privately held goods, and their exchange is often socially regulated. Milk and cows are considered to have private prestige status and cows have been among the most socially significant means of exchange, used to build and cement, specific, life-long relations. The exchange of a heifer, considered the most productive member of the herd, is marked by the prestigious term of address *pakiteng* (giver/receiver of a heifer; Talle, 1990). In this light, the fact that the DG framed the gift under pure anonymity (by insisting it would be an anonymous contribution to the requestor) may also have stripped the act of its social significance and its relational context, something that does not ever happen around the gifting of cattle. Milk, as discussed earlier, is also shared mostly with very close social relations as requesting milk can feel stigmatizing.

Our findings that sharing behavior is multidimensional and strongly depends on the social distance between donor and recipient have potentially far-reaching implications for experimental field studies. Decision making as well as time, risk, and social preferences are typically measured with economic games adapted from behavioral economics and psychology. These games are often implemented using financial incentives, but frequently also use non-monetary currencies. Our data suggest that different sharing commodities go along with different sharing behaviors and that the type of currency moderates the effect of social distance on sharing behavior. In addition, we argue that the currency-dependent effects on social discounting are highly culture specific; the same currencies used here might induce different social-distance-dependent sharing behavior in another culture than the Maasai. This implies that cross-cultural comparisons of standardized economic test data have to be interpreted with caution and they always have to be understood with the particular cultural values, norms, and customs in mind (Lesorogol, 2007). In addition, our data call for sound measurements of the psychometric properties of currencies used to elicit social preferences; without such knowledge, the interpretation of sharing or choice behavior is potentially flawed. We conclude that future research should consider the culture-specific idiosyncrasy of sharing behavior. At the same time, our research opens new avenues for characterizing systematic higher-order differences and commonalities in sharing behavior between different cultures.

In conclusion, our findings underscore that sharing is multidimensional among the pastoral Maasai. The specific DG findings are likely to change over time with dynamics in the types of livelihoods and income-generating activities being pursued by the Maasai, changing the nature (communal) and value (status maker or breaker) of the specific goods used in the DG.

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