

# Intergroup Contact and Rice Allocation via a Modified Dictator Game in Rural Cameroon

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Field Methods

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## Abstract

Economic games in field settings have been subject to criticism concerning their ecological validity. We use social identity theory and the intergroup contact hypothesis as a framework to illustrate how economic games can be applied to field settings with higher ecological validity. A quasi-experiment in two rural Cameroonian villages studied participants' allocation of rice to co-inhabitants of their village. The villages are characterized by different degrees of contact between the ethnic groups and the sexes. Our results indicate that women who are segregated from each other disadvantage other women more than men or women who

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experience higher amounts of contact. These findings are interesting from a theoretical and methodological perspective since we utilized a nonmonetary stake in naturalistic intergroup settings.

### **Keywords**

dictator game, Cameroon, ecological validity, intergroup contact

Experimental economic games have been played with Sukuma and Pimbwe people in Tanzania (Paciotti and Hadley 2003), with Hadza in Tanzania (Marlowe 2004), Torguud and Kazakh in the Republic of Mongolia (Gil-White 2004), and with the inhabitants of villages in the Commonwealth of Dominica (Macfarlan 2011). Such games are useful for measuring aspects of social norms and preferences. By allowing reciprocity, inequality aversion, and altruism to become visible in a quantifiable manner, economic games have become increasingly important in anthropology since the mid-1990s (see Camerer and Fehr 2004; Chibnik 2005).

This study uses the dictator game, which consists of a “one person decision task”: the players (dictators) individually distribute a stake between themselves and their recipient. The recipient cannot object to the dictator’s allocation; the resources are split according to the dictator’s wishes. Since the dictator does not have to fear repercussions from the recipient, the dictator game is usually seen as providing a pure measure of altruism (Camerer and Fehr 2004). In the classic dictator game, the dictators and the recipients do not know each other’s identity; it is seen as a crucial characteristic of the game that the players remain anonymous (see Henrich et al. 2001).

Self-interest suggests that the dictator keeps the entire stake and gives nothing to the recipient. However, many studies obtained different results (see Bolton et al. 1998; Henrich et al. 2001). Bolton et al. (1998) suggest that allocations arise from concerns for fair distribution on the part of dictators. These fairness concerns originate from personal and social rules that impact on self-interested behavior. However, when dictators distribute a gift among multiple recipients, individual dictators show little tendency toward fairness (Bolton et al. 1998).

A possible explanation comes from social identity theory (Tajfel and Turner 1979). Social identities are based on an individual’s membership in relevant social groups. The groups a person identifies with are

in-groups and can include one's nationality, religion, gender, and ethnicity. In contrast, out-groups are groups other than one's own; individuals tend to distinguish between "us" and "them," with important attitudinal and behavioral consequences (see Brehm et al. 2005).

Even if the distinction between in-group and out-group is based on minimal and irrelevant criteria, individuals tend to favor in-group over out-group members (Tajfel et al. 1971). Using a student sample, Ben-Ner and colleagues (2009) demonstrated clear in-group favoritism in imaginary and real dictator game giving. Unfortunately, only their second study involved allocating an actual monetary stake. Goette et al. (2012) compared the impact of random assignment to minimal versus real groups on the allocation of a monetary stake in Swiss army officer candidate trainees. While both types of group membership lead to in-group favoritism, in-group favoritism was stronger for army recruits who had been allocated to real social groups as compared to minimal groups. Ruffle and Sosis (2006) conducted an experiment among Israeli kibbutzim and city residents. Kibbutzim showed clear in-group favoritism; there were no significant differences among the residents of the kibbutzim and the city in their allocations of a monetary resource in a cooperative, simultaneous game.

Gil-White (2004) investigated whether players favored in-group over out-group members in an ultimatum game. Contrary to the findings above, the players favored the ethnic out-group. Yet, it is important to note that ultimatum games allow repercussions from the recipient, which is not true for dictator games. Yamagishi and Kiyonari (2000) showed that in-group favoritism can be overridden by reciprocity expectations. While in a simultaneous game—that is, not allowing for reciprocity—participants favored members of their own group; in a supposedly sequential game—allowing for reciprocity—this in-group favoritism disappeared.

Enabling interactions between the members of rival groups can reduce discrimination (e.g., Allport 1954; Cook 1978). Allport (1954) concluded that people who live together with out-group members are friendlier, less fearful, and stereotype less than people living in segregated areas. Communication and joint community enterprises are important to create conditions under which friendly contact and correct social perceptions can develop.

## The Current Research

Economic games sometimes lack external and ecological validity (e.g., Benz and Meier 2008; Levitt and List 2007). Gurven and Winking

(2008) argue that the anonymity requirement and the artificial setting undermine the links between findings obtained in non-laboratory research. Thus, our decisions to relax the anonymity condition and to use nonmonetary resources for allocation may enhance ecological validity (see Alvard 2004; Gurven and Winking 2008; Henrich et al. 2001). One alteration to the commonly used game protocol is the use of rice as stake in this study (see also Alvard 2004).

There are several reasons why we chose rice as stake. In Cameroon, 48% of the population live below the poverty line (Central Intelligence Agency [CIA], 2012), with most of the poor being in the rural areas such as the villages we have studied. We found it ethically problematic to introduce monetary stakes to a research sample in these poor communities. Another practical obstacle was the lack of small change. It was difficult to consistently change bank notes to coins. We used rice since it was easily available, valued, and easy to share.

The second procedural alteration was the removal of recipient anonymity. The easiest and most natural way to make group membership salient was to name the recipient. We felt that it would be artificial and risk biasing the results to refer to recipients by their group memberships only.

The intergroup contact hypothesis (e.g., Allport 1954; Pettigrew 1998) was designed to overcome racial prejudice and discrimination. Intergroup contact can challenge intergroup discrimination if members of the different groups have the opportunity to engage in positive contact. Our study tests this assumption in two different field sites in the Nigeria–Cameroon borderland, which differ in relative frequency of contact between the sexes and the cohabiting ethnic groups. We investigated whether (1) dictators distinguish between different recipients based on the recipients' group membership (ethnicity, sex) and (2) the allocation of rice is different for the two villages. This question is particularly interesting with reference to (3) female rice allocation, since there is more contact between the women of Somié than between the women of Oumyari.

## Study Sites

### *Oumyari*

Oumyari is located in the Adamawa Region of Cameroon, close to the Nigerian border. The closest administrative center is the town Banyo, approximately 15 km away. The population of Oumyari is comprised mainly of peasant farmers, who grow maize and manioc principally for subsistence but also as cash crops. Approximately 500 inhabitants live in the

village, which is made up of 13 hamlets. The two main ethnic groups in Oumyari are the Wawa and the Fulbe. Wawa people live in 11 of the hamlets. The remaining two hamlets are populated exclusively by Fulbe people. The Wawa hamlets from which participants were chosen are populated exclusively by Wawa. The names of Fulbe out-group recipients were chosen from people living in the two Fulbe-only hamlets. The dictator game in Oumyari was run by Thomae and Griffiths together with local assistants.

Fulbe and Wawa have a difficult past. The Wawa are part of the original population of the area, which was invaded by the Fulbe approximately 150 years ago. The Wawa subsequently acceded to Fulbe dominance (see Gausset 1999). All the Fulbe and mixed population hamlets are located on the northern side of the small river that runs through Oumyari, while most of the Wawa hamlets are located on the southern side. The Fulbe are regarded as foreigners and strangers by the older Wawa. On most days, Wawa and Fulbe do not interact. Their hamlets and surrounding forest areas are separate from each other. However, on Fridays, men (and a few women) from all hamlets come to the central Wawa hamlet to take a lorry to the market in Banyo.

There is strong gender segregation for both Wawa and Fulbe. A tradition for young men in Oumyari includes building a house. They then construct a second house and a kitchen for a potential wife on the same piece of land and finally build a fence around this compound once a marriage has been agreed on. To a great extent, women's lives are lived within these compounds. Women need a reason such as fetching water or going to the fields if they want to leave their compound. Women visit each other within compounds but do not socialize outside them. In contrast, men's lives are lived both within and beyond the compounds. Men meet in the mosque, in the streets, the hamlets' centers, and on the village's numerous football fields. Both men and women work in the fields; however, usually they work at different times or in separate locations. Apart from these duties, women require their husband's permission to leave their compound. Men decide freely about their own activities. For more detailed information on the historical context between the Wawa and the Fulbe, see Gausset (1998, 1999).

### *Somié*

Somié village is also located in the Adamawa region, approximately 90 km from Bankim, its administrative center, to the south of Banyo. The

population is mainly comprised of peasant farmers, who are self-sufficient in staples, growing maize, ground nuts, and coffee as cash crops. The village population has grown from approximately 2,000 inhabitants in 1986 to approximately 5,000 inhabitants today. The village center where the game was played has a population of approximately 2,000 inhabitants and is inhabited by Cameroonian Mambila, with a large number of Nigerian Mambila who immigrated over the last 20 years as well as a number of Fulbe and other ethnicities. The local assistant who ran the dictator game in Somié is a Mambila male, approximately 45 years of age who has worked for Zeitlyn on many occasions conducting village censuses and mapping exercises.

In 1985, Somié was almost exclusively Mambila. The main change since then is that large numbers of Nigerian Mambila moved in and built houses adjacent to the village, thereby expanding it. Although Cameroonian Mambila are mainly Christians with a sizable minority of Muslims, Nigerian Mambila are almost exclusively Muslims. When Fulbe arrive, they tend to live with or near their coreligionists. Until approximately 1995, Fulbe came for dry season transhumance only. Since then, some have been staying throughout the year and a few families have settled permanently. There are no hamlets that are ethnically homogeneous. Some Fulbe live in outlying hamlets, others in the village center.

Women tend to live separate lives from men, giving them autonomy. However, on market days and on Sundays, there is mixed social activity revolving around the drinking of local maize beer and the meetings of revolving credit associations (see Ardener 1964; Zeitlyn 2003). Most revolving credit associations are mixed. About two-thirds of the village inhabitants are Christians, and services and related activities are mixed. Some Mambila women have married Fulbe men and subsequently converted to Islam, coming to lead more sheltered lives in the process. However, these women still farm and go to market. Zeitlyn is not aware of any Fulbe women who have married Mambila men. Both sexes are involved in farming, but they do so separately. Women's tasks involve cooking and childcare. Men's tasks include building houses. Both sexes fish. Generally, and in contrast to Oumyari, women in Somié can move freely (e.g., go to the market or visit friends). More information about the social structure of Somie may be found in Zeitlyn et al. (2000) and Zeitlyn (1994).

### *Food-sharing Norms*

Rice in the villages is an expensive crop and many families reserve it for special occasions. On a daily basis, the villagers' diet is based on other

crops, particularly manioc and sweet potatoes. Rice consumption is similar to that of meat. Nevertheless, rice is usually available from village shops.

Neither village has norms to share raw or uncooked food such as the rice in the experiment. However, there is a sharing norm for cooked food: If someone visits when people are eating, there is a strong injunction to offer them food and it is very impolite for a visitor to refuse to eat. Visitors usually have a small taster so as to not imply suspicion that the offered food is poisoned. In both villages, the offer of cooked food by the hosts serves to disprove witchcraft by assuring the visitor (who accepts this by eating) that no “sweet meat” (i.e., human flesh) is eaten (see Zeitlyn 2003).

## Method

### *Participants*

Twenty Wawa men and 20 Wawa women in Oumyari and 20 Mambila men and 20 Mambila women in Somié participated as dictators in this experiment. We selected participants by asking local teenagers to compile a list of adult women and men in each village. We instructed these children to list names of 30 in-group and 10 out-group adults, with equal numbers of males and females. Thus, participants were not selected randomly and are not representative of the village populations. Any adult villager was eligible for participation.

While this sampling strategy worked well in Oumyari, the list for Somié resulted in unequal numbers in the experimental conditions. Data on age and marital status were not available (see Zeitlyn and Bagg 2000).<sup>1</sup> Due to the sampling method, it appeared that adults of childbearing age were overrepresented. All participants invited to play the game agreed to participate.

### *Design*

The ethnic groups of the participants (Wawa, Mambila) were defined as the in-groups and in both cases the Fulbe were defined as the out-group. The in-group participants allocated rice either to an in-group or to an out-group member. The study had a 2 (village)  $\times$  2 (sex of recipient)  $\times$  2 (ethnic group of recipient)  $\times$  2 (sex of dictator) quasi-experimental design. The participants (dictators) were matched with recipients. The dependent variable was the amount of rice participants allocated to their respective recipient from a stake of 1 kg of rice. We measured the quantity of rice using a food scale.

## Procedure

The game was played in each village over two consecutive days to avoid contamination through communication among participants. We filled 40 plastic bags with 1 kg of rice each. Since there is no food-sharing norm for uncooked food in either village, we used the translation of “share” (Mambila *kop*, Wawa *gɔ̃g*) in our instructions: “Here is 1 kilogram of rice. Please share it, one part is for you, one part for [the recipient].” Neither local word for share implies halves.

We visited all allocators at home. All allocators knew their recipients personally, but we did not observe attempts by the allocators to contact recipients (we did not undertake specific steps to mitigate this, deeming it an acceptable risk in the social context). The recipients did not know the identity of the allocators. All participants appeared to understand the game instructions and we did not ask comprehension questions or conduct postgame interviews. Similar to the uncontextualized game in Lesorogol’s (2007) research, the allocators made no reference to any particular norm. In general, allocators commented very little on the game and did not explain their offering choices.

We initially intended that participants would pour the rice for the recipient into a different plastic bag. However, the allocators preferred to pour as much rice as they wanted for themselves into a dish and leave the recipient’s share in the original plastic bag. After data collection was completed, we weighed each rice bag and recorded the result. Later, we visited all recipients to hand them over their rice anonymously.

## Results

The average amount of rice allocated was 444.00 g ( $SD = 74.00$ ), ranging from 162 g to 560 g. A univariate analysis of variance was used to analyze the impact of village, sex of allocator, sex of recipient, ethnic group membership of recipient, and all possible interaction effects on the amount of rice allocated. A complete table for the analysis of variance results can be found as supplementary materials online. This analysis yielded a significant main effect of sex of allocator,  $F(1, 64) = 7.98$ ,  $p = .006$ ,  $\eta^2 = .11$ , indicating that men allocated larger amounts of rice ( $M = 461.00$ ,  $SD = 46.56$ ) than women ( $M = 428.00$ ,  $SD = 91.42$ ). There was no significant main effect of village in the allocation of rice,  $F(1, 64) = .29$ ,  $p = .590$ ,  $\eta^2 = .01$ , indicating that allocators in Oumyari ( $M = 439.00$ ,  $SD =$



72.23, ~44%) did not allocate the rice significantly differently from allocators in Somié ( $M = 449.00$ ,  $SD = 76.33$ , ~45%).

Village and sex of recipient interacted significantly,  $F(1, 64) = 8.17$ ,  $p = .006$ ,  $\eta^2 = .11$ ). A planned comparison revealed that women in Oumyari received significantly less rice ( $M = 427.00$ ,  $SD = 76.03$ ) than women in Somié ( $M = 474.00$ ,  $SD = 92.85$ ,  $p = .046$ ). This finding supports our hypothesis that participants would be less generous toward women in Oumyari, where women are less visible. In contrast, women are better known to other village inhabitants in Somié. Figure 1 shows this pattern of results. However, this finding needs to be treated with caution since this interaction effect is qualified by a significant three-way interaction effect between village, sex of allocator, and sex of recipient.

Village and ethnic group membership of recipient also interacted significantly,  $F(1, 64) = 14.01$ ,  $p < .001$ ,  $\eta^2 = .18$ ). We compared the allocation of rice to the in-group versus out-group in both villages using planned comparisons. The Fulbe out-group in Oumyari received significantly less rice ( $M = 409.50$ ,  $SD = 77.42$ ) than the Fulbe out-group in Somié ( $M = 470.00$ ,  $SD = 46.11$ ,  $p = .008$ ). This finding supports the hypothesis that in Somié, the out-group is treated in a more altruistic manner. This pattern of results is shown in Figure 2.

Moreover, sex of recipient and ethnic group membership of the recipient interacted significantly,  $F(1, 64) = 9.72$ ,  $p = .003$ ,  $\eta^2 = .13$ . Further analysis revealed that participants did not discriminate between in-group and out-group men (in-group men:  $M = 425.00$ ,  $SD = 94.28$ ; out-group men:  $M = 453.50$ ,  $SD = 64.95$ ,  $p = .206$ ) but discriminated between in-group and out-group women by favoring in-group women ( $M = 475.00$ ,  $SD = 45.23$ ) over out-group women ( $M = 426.00$ ,  $SD = 73.69$ ,  $p = .037$ ). This pattern of rice allocation can be seen in Figure 3.

Finally, there was a three-way interaction between village, sex of allocator, and sex of recipient on rice allocation,  $F(1, 64) = 4.92$ ,  $p = .030$ ,  $\eta^2 = .07$ . In line with our hypothesis, a planned contrast revealed that there was a significant difference between the amount of rice allocated by women to women in Oumyari ( $M = 391.00$ ,  $SD = 79.10$ ) and the amount of rice allocated by women to women in Somié ( $M = 473.00$ ,  $SD = 46.71$ ,  $p = .006$ ). This was not true for male–male allocation in the two villages (Oumyari:  $M = 458.00$ ,  $SD = 46.86$ ; Somié:  $M = 454.00$ ,  $SD = 47.18$ ,  $p = .897$ ). All means and standard deviations are available in Table 1.

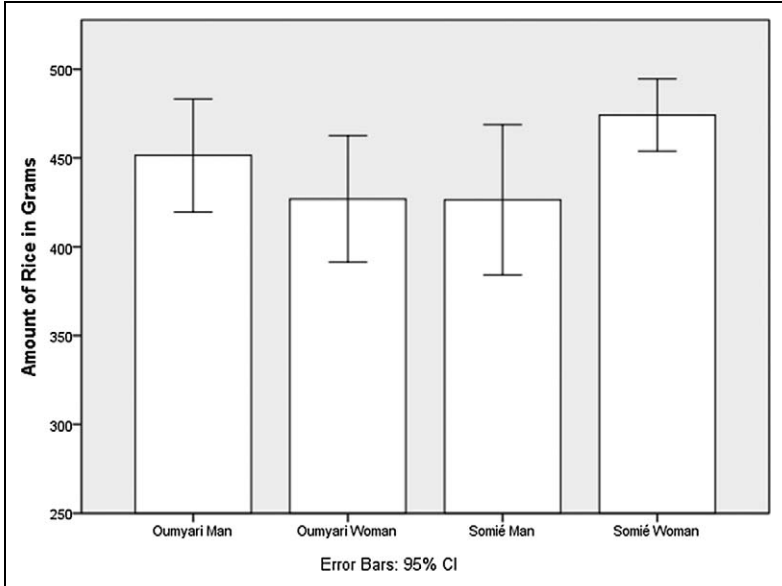
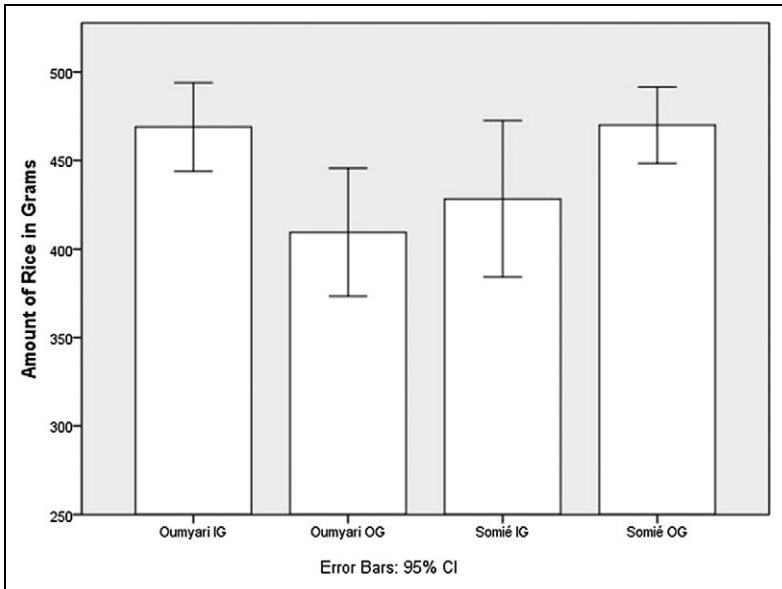


Figure 1. The amount of rice allocated by village and sex of recipient.

### Discussion

The aim of this study was to increase ecological validity of the dictator game by relaxing the anonymity requirement for the dictator and using rice as the stake instead of money. The findings supported the hypotheses derived from previous research (Allport 1954; Bolton et al. 1998; Tajfel and Turner 1979).

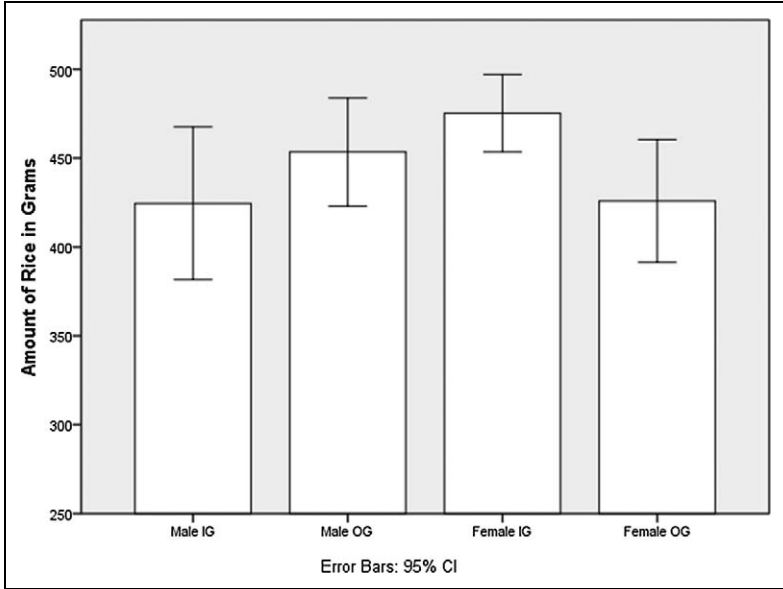
In earlier research, women donated significantly more than men to an anonymous partner (Eckel and Grossman 1998). In our study, men allocated larger amounts of rice than women, which may be due to the choice of rice as the stake: Women provide approximately 70% of all agricultural labor and produce approximately 90% of the food in sub-Saharan Africa (United Nations Development Fund for Women [UNIFEM] 2008). In rural Africa, women perform 80% of domestic tasks, including preparing and cooking meals and processing and storing food. Thus, for women, rice may have more importance than for men since they tended to retain larger amounts of the stake. Future research may replicate this study to clarify the roles of specific stakes in the allocations made by dictators.



**Figure 2.** The amount of rice allocated by village and ethnic group of recipient.

In Oumyari, male recipients received more rice than female recipients, while the opposite was true in Somié. One explanation is the reduced visibility of women; hence, the reduced contact of both sexes with women in Oumyari as compared to Somié. Across all allocators, there is a preference of in-group over out-group women in the allocated amount of rice. Our argument is further corroborated by the finding that particularly women in Oumyari discriminate against out-group women, which is not the case in Somié, which is more integrated. Yet, it is important to acknowledge that there are limitations to our findings. Future research may wish to control for confounding variables by ensuring that the included villages have inhabitants of the same in-group, religion, intergroup history, and other background variables (see Ensminger 2004).

Games aim to elicit “pure” behavior by isolating it from social contexts. However, Lesorogol (2007) demonstrated that allocators adhered to a meat-sharing norm in a contextualized but not in an uncontextualized game. She argues that the likelihood of normative behavior depends on the significance of the norm invoked by the game situation. Similarly, other



**Figure 3.** The amount of rice allocated by sex and ethnic group membership of recipient.

factors such as the experimenter observing the allocation might induce guilt or shame in the allocator and thus curb selfish behavior (e.g., Koch and Normann 2008). Koch and Normann’s results indicate that approximately half of dictator giving is externally motivated. Further research is needed to rule out such factors in the explanation of our data.

Henrich et al. (2005:813) state that “extensive market interactions may accustom individuals to the idea that strangers can be trusted.” Since there was no overall difference in rice allocation between the two villages but a difference in the allocation to visible versus less visible female villagers, we propose that our findings are based on the amount of interaction taking place with village co-inhabitants. Trust is an outcome of social interaction and contact (Hewstone et al. 2006). We suggest that the higher involvement in market participation by women in Somié (in contrast to Oumyari) may constitute a way of encouraging social contact and interaction, thus building trust and reducing discrimination.

There is evidence that when allocators distribute a stake between multiple recipients, most allocators tend to discriminate between different

**Table 1.** Rice Allocation by Village, Sex of Allocator, and Sex of Recipient.

Village							
Oumyari				Somié			
Sex of Allocator							
Male		Female		Male		Female	
Sex of recipient							
Male	Female	Male	Female	Male	Female	Male	Female
458.00 (46.86)	463.00 (55.39)	463.00 (86.31)	391.00 (79.10)	454.00 (47.18)	478.00 (34.17)	406.00 (136.12)	473.00 (46.71)
N = 10	N = 10	N = 10	N = 10	N = 14	N = 6	N = 7	N = 13

recipients (Bolton et al. 1998). This article attempted to systemize ideas as to why dictators treat multiple recipients unequally. Even though there are other important differences such as religious affiliation and the extent and history of the relative domination by/independence from the Fulbe between the two villages, we believe that the different degrees of contact in these communities may play a vital part in the differential treatment of in- and out-group recipients.

Finally, we wish to emphasize the importance of theoretically driven tests in anthropological settings. We believe that specifically in cases where communities at field sites are composed of different ethnic, religious, or other groups, the social psychological literature on group processes and intergroup relations (e.g., Crisp and Turner 2010) can make a valuable contribution to anthropology. In addition, social-psychological research can benefit from its application to novel, out-of-laboratory settings. In particular, our study enriches social-psychological research by applying behavioral measures and, avoiding convenience samples, using a nonstudent sample in a natural setting (see Henrich et al. 2010). There are confounding influences in such field settings, which may constitute a threat to the theoretical interpretation and validity of the findings. However, we think that the application of experimental methodology can make an interesting contribution to research in field settings.

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## Note

1. Questions on demographic data are delicate in various village contexts and are usually asked only by bureaucrats or medical personnel. If we had attempted to ask them, it would have changed the exercise from a relatively lighthearted game into a far more charged situation, prompting suspicion and evasion (typical responses to bureaucrats). In the end, we decided that although we could have attempted to collect such information in a separate data collection exercise, the difficulty in obtaining reliable data did not justify the additional analytic purchase of such data, especially since this is pilot research, seeking to demonstrate that the method can be applied in these sorts of field environment.

## Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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