



## Friends near and afar, through thick and thin: Comparing contingency of help between close-distance and long-distance friends in Tanzanian fishing villages

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### ARTICLE INFO

#### Keywords:

Friendship  
Long-distance relationships  
Mobility  
Reciprocity  
Cooperation  
Risk management

### ABSTRACT

Humans form and maintain friendships across long distances, which can provide access to non-local resources and support against large shocks that affect the entire local community. However, there may be a greater risk of defection in long-distance friendships, as monitoring for defection is more difficult at greater distances; accordingly, help between long-distance friends may be more explicitly contingent than between close-distance friends. We interviewed 918 participants from 21 fishing villages in Tanzania about whether they had received help in the form of a gift or loan from a friend living in their village and a friend living in a neighboring village. As there are local expectations that loans will be repaid but gifts will not, we predicted that close-distance friends would be more likely to help with gifts, whereas long-distance friends would be more likely to help with loans. Contrary to our predictions, gifts and loans between close- and long-distance friends were similar in kind and amount, though close-distance friends provided help more frequently, possibly because close-distance friends are more likely to meet frequently and belong to the same religious congregation. These results indicate that long-distance friendships are an important, and likely robust, strategy for managing risk and accessing more resources.

### 1. Introduction

Humans frequently form and maintain cooperative relationships with people living in other locations, sometimes even across vast distances. Long-distance relationships are a common and recurrent feature of human sociality across time and space (Braun & Plog, 1982; Demps & Winterhalder, 2019; Hruschka, 2010; Lathrap, 1973; Malinowski, 1922; Pelling, 2002; Pisor & Gurven, 2016, 2018; Pisor & Surbeck, 2019; Smith, 1988; Spielmann, 1986; Whallon, 2006; Wiessner, 1977). For example, Massim peoples of the Trobriand Islands would travel hundreds of kilometers across the ocean in canoes to maintain ritual relationships in the *Kula* ring with partners they rarely see (Irwin, Shaw, & McAlister, 2019; Malinowski, 1922). Long-distance relationships are unusual among primates. While other great apes sometimes tolerate conspecifics in other groups, the motivation to form long-distance

relationships is pronounced in humans, and cultural institutions often emerge that lower the costs of these relationships (Pisor & Surbeck, 2019). For example, religious affiliations cutting across community boundaries build trust and encourage relationships between communities (Ensminger, 1992; Purzycki et al., 2018; Sosis, 2005). The prevalence of long-distance relationships in humans suggests that they are an important and derived feature of human sociality.

Long-distance relationships take many forms, such as marriage partners, trade associates, and friends (Pisor & Ross, 2022). Here, we focus on long-distance friendships, contrasting long- and close-distance friends. Friendships are long-term relationships in which people provide mutual aid to one another because of positive affect felt toward each other (Hruschka, 2010). Friendship has multiple functions, including buffering against shortfalls in money, food, or other resources. One way to manage the risk of shortfalls is to help each other reciprocally

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(Trivers, 1971), providing help only when help has been received or will be repaid. However, this strategy is ineffective when environmental predictability is low and friends more effectively buffer against risk by offering help when the other is in need, regardless of the current state of debts between them (Aktipis et al., 2016; Aktipis, Cronk, & de Aguiar, 2011). As such, close-distance friends do not closely track debts of help between one another. For example, US students judge friendships that repay contributions in-kind or immediately afterward as less close (Clark, 1981; Shackelford & Buss, 1996), and Chinese, Japanese, and US students do not closely track how much friends give and are more tolerant of imbalances in contributions in economic games (Xue & Silk, 2012). Instead, close-distance friends help each other when needed as long as the benefits of receiving help outweigh the costs of helping in the long run (Hruschka, 2010; Silk, 2003; Tooby & Cosmides, 1996). That is, help between close-distance friends is not explicitly contingent on the help being repaid.

Like close-distance friendships, long-distance friendships function as a source of assistance in times of need, but diversify resource-access networks in ways close-distance friends cannot. First, long-distance friends provide access to resources that are not available in the local environment (Pisar & Ross, 2022; Pisar & Surbeck, 2019). For example, in rural Bolivia, long-distance friends provide access to resources only available in the city, like good jobs, less-expensive technology, and a place to stay during travel (Pisar & Jones, 2021; Pisar & Ross, 2022). Second, long-distance friends buffer against shortfalls that are temporally or spatially autocorrelated (Pisar & Jones, 2021). Shortfalls can be experienced by an entire community at the same time, and when this happens, close-distance friends cannot help each other as both are in need of help (Aktipis et al., 2011). Extending one's social network across greater distances can provide access to help even when one's neighbors are affected (Bollig, 2006; O'Shea, 1981). For example, in rural villages in Philippines and Tanzania, help after shocks largely comes from networks of friends and relatives that include ties between villages (De Weerdt & Dercon, 2006; Fafchamps & Lund, 2003; Riley, 2018).

Compared to close-distance friends, long-distance friends interact less frequently, have more difficulty monitoring each others' resources, and are less likely to share cooperative institutions, all factors that help stabilize cooperation in long-term dyadic interactions and reduce the need for strict tracking of levels of reciprocity. Reciprocal strategies in repeated prisoners' dilemmas are successful when the rate of encounter is sufficiently high (Nowak, 2006), and long-distance friends may not interact frequently enough to meet this threshold. Less frequent interactions between long-distance friends also make it easier to hide resources from each other, and an inability to monitor resources encourages cheating of need-based sharing between friends (Claessens, Ayers, Cronk, & Aktipis, 2021). Finally, errors in cooperation are possible in the real-world, and such errors can lead to mutual defection and dissolution of the friendship (Axelrod, 1980; Silk, 2003). Shared cooperative institutions can help smooth over these misunderstandings (Fearon & Laitin, 1996), but long-distance friends are less likely to share cooperative institutions that could help reinforce aid to one another, making help between long-distance friends more vulnerable to exploitation. As such, while compared to help outside of friendships, help between long-distance friends may be less strictly reciprocal, compared to close-distance friends, long-distance friends may need to make their help more contingent on being reciprocated; for example, tit-for-tat exchanges of livestock among pastoralists at great distances (Bollig, 2006). Relying on a long-distance friend returning the favor without an explicit agreement opens oneself up to costly exploitation.

We argue that long-distance friends are more likely to make their help explicitly contingent on being repaid because infrequent interactions and lack of shared cooperative institutions make them more vulnerable to exploitation. If true, then friends who interact less frequently or do not share a cooperative institution, will be more likely to only give help with reassurances that it will be repaid. Some long-distance friends may interact more frequently than others — for

example, because there is less distance between them, mobility is high, or technology is readily available — and these friends can easily monitor each other and are more likely to be available to help. Or they could belong to the same cooperative institution. For example, need-based help among long-distance relationships in the San and Maasai are embedded in ritual institutions, which reinforce need-based sharing (Cronk, 2007; Weissner, 1977). In another example, the influence of religious institutions can cut across distances and be effective at building trust between co-religionists, even in different communities (Ensminger, 1992; Purzycki et al., 2018; Sosis, 2005). Belonging to the same congregation also provides mediating mechanisms for disputes, such as religious leaders encouraging friends to repair their relationship (Bulbulia & Sosis, 2011; Grabo & van Vugt, 2016). When friends interact more frequently or belong to the same religious institution, regardless of distance, help between friends can be less explicitly contingent.

We hypothesize that help between long-distance friends will be more explicitly contingent than between close-distance friends, and that help between friends will be less explicitly contingent when they interact more frequently or are members of the same religious congregation. We tested our hypotheses among Kiswahili-speaking people in fishing villages in the Tanga Region of Tanzania by asking participants what help they received from friends living in their village or in other villages. We compared help received from friends who live in the same village as the participant (close-distance friends) to help received from friends who live in different villages but can access the same fishery<sup>1</sup> (long-distance friends). To compare contingent helping, we focused on two forms of helping: giving vs loaning money. Gifts entail movement of money where tit-for-tat reciprocation either was not expected or never happened with negative consequences for the friendship, while loans mean movement of money that was either reciprocated or which return is still expected. We predicted that the difference among close-distance friends in the probability, amount, and frequency of receiving gifts versus loans would be greater than the difference among long-distance friends. Further, regardless of distance, people in friendships that interact more frequently or belong to the same religious institution would be more likely to receive, receive greater amounts, and receive help more frequently in the form of gifts versus loans.

## 2. Method

### 2.1. Ethnographic context

#### 2.1.1. Population

Swahili culture has been shaped by millennia of maritime life and long-distance relationships with other regions along the Indian Ocean, namely Arabia, Persia, and the Indian subcontinent. Ancestors of Bantu-speaking peoples moved from the interior of Africa to the coast early in the first millennium CE, practicing a mixed-subsistence strategy of agriculture and marine foraging (Fleisher et al., 2015). Traders from India, Persia, and Arabia would travel to East Africa on the southwestern monsoon winds exporting salted fish and would stay in East Africa to carry raw materials back on the northeastern monsoon winds, establishing families and secondary domiciles during their extended stay (Sheriff, 2010). With the traders came Islam, and by the 13th century, most cities on the East African coast were Islamic (Fleisher et al., 2015; Pouwels, 2002).

Today, approximately 20% of Tanzanians live within the coastal zone (National Bureau of Statistics Tanzania, 2012), relying on maritime production as their primary source of subsistence and income. About 95% of all fishing in Tanzania is artisanal, concentrated along the inshore shallow water; the most productive fishing grounds are coral

<sup>1</sup> Access to the same fishery was determined by belonging to the same Collaborative Fishery Management Area (CFMA), which is a participatory co-management institution between villages to sustainably manage fisheries.

reefs, mangrove creeks, seagrass beds, and sand banks (Jiddawi & Ohman, 2002). The predominant religion on the coast remains Islam. Tanzania has over 100 recognized tribes or ethnicities, yet most Tanzanians emphasize their shared national identity (Eifert, Miguel, & Posner, 2010); cooperation between ethnic groups is common (Miguel, 2004) and interethnic conflict is rare in most areas.

### 2.1.2. Material and institutional structures

Most villages in the region lack consistent access to clean water, and villages vary in their access to electricity, healthcare, large markets, and secondary schooling. All villages are market-integrated, with multiple shops in each village and everyone using cash in transactions on a regular basis. People often travel between villages to access utilities that their village lacks. Villages along the coast are generally a few kilometers away from a main road, which is serviced by busing. From the main road, most villages are accessible by a dirt road either by walking or hiring a motorcycle, and some villages are serviced directly by buses. Most villages have cellphone coverage from at least one carrier and an agent for that carrier to purchase airtime or withdraw cash from mobile banking. In our sample, 95% of people reported someone in the household owning a mobile phone.

The government provides a limited social safety net, which offers minimal risk buffering. People can organize into groups of twenty or more to apply for a group loan from the district government, for example, to buy and share better fishing equipment, though this is uncommon. Villagers can also get support by joining village community banks (VICOBAs), micro-finance institutions in Tanzania designed to improve quality of life and gender equality, as women are more likely to participate than men (Kato & Kratzer, 2013). VICOBAs members contribute money for social protections, which members can withdraw in case of emergency or as microloans for their businesses. In our sample, 39% of participants belonged to a VICOBAs. However, because government support is minimal, help usually comes from people's social networks, especially through the use of mobile banking. Access to mobile banking allows for more effective risk-sharing, and in rural Tanzania, is associated with improved recovery following droughts and floods (Riley, 2018).

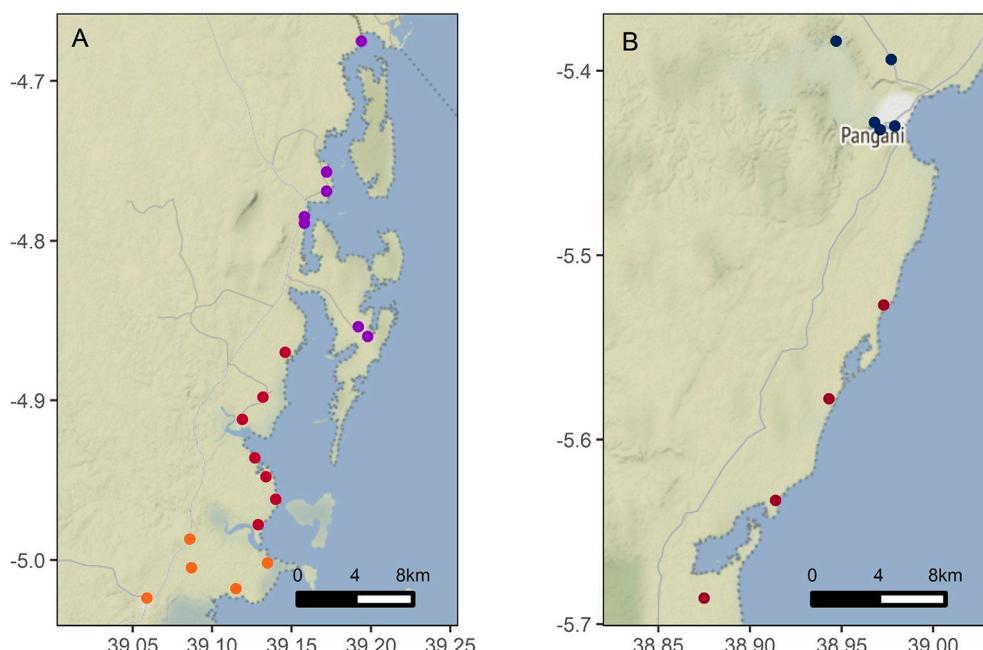
### 2.2. Sample

KMS, BA, KB, PF, and RK collected data from January 2022 to March 2022 in 28 fishing villages across five fisheries in the Tanga Region in northeastern Tanzania (see Fig. 1). We recruited 1399 participants with the help of local leaders. However, due to a coding error in the survey, participants in seven villages were not asked follow-up questions about receiving gifts from their close-distance friend, and we excluded these 334 participants. Of the remaining participants, 139 said they had no friends and were excluded. Eight participants were excluded because their residences were not recorded, and another participant was excluded because their age was not recorded. After exclusions, the sample was 917 participants (317 women, 855 Muslims, 677 married, mean age = 43.2 years-old). See Table S3 for further demographic statistics. The median estimated daily income in the past month was 3300 TSH (conversion rate at the time 1 USD ~ 2310 TSH). Participants were paid 5000 TSH for participation.

### 2.3. Procedure

Interviews were conducted in Kiswahili using Open Data Kit (ODK) (Hartung et al., 2010) on a cellphone to record responses. For each village that could access their fishery, participants were asked the number of relationships they had in three separate categories: kin, friends, and business associates, always in that order. The questions did not explicitly state that a person could also not belong to the other relationship categories, but interviewers confirmed that no person was double-counted. For example, a person could list a cousin as a friend, but could not also list that person as kin. Examining follow-up discussions of how they met their friend indicated that likely only a small number of friends were also genetic or affinal kin.

We did not define relationship categories for participants and only specified the friend could not live in the same household as the participant. Kiswahili has a word, rafiki, that directly translates to English as friend; in pilot interviews in the Lindi and Pwani regions, participants indicated that a friend was someone who is obligated to help you and you are obligated to help them. There was disagreement whether kin could be friends; those who said family are not friends explained that family is not chosen, but friends are. Participants in the pilot interviews also told us that business associates are not friends because they split



**Fig. 1.** Villages sampled in (A) Tanga Rural and Mkinga districts north of Tanga City and (B) Pangani district south of Tanga City. Points in the same colour are villages accessing the same fisheries. The villages in orange and two of the villages in red in (A) were excluded because of a coding error in the survey. The map was created using the ggmap version 3.0.0 (Kahle & Wickham, 2013) and ggsn version 0.5.0 (Santos Baquero, 2019) packages. (For interpretation of the references to colour in this figure legend, the reader is referred to the web version of this article.)

profits and are not obligated to help one another. In short, there is general agreement that friends are obligated to help one another—the consensus definition of friendship cross-culturally; likewise, whether a friend must be chosen to count as a friend varies in this context, much as it does cross-culturally (Hruschka, 2010). In pilot interviews, participants shared many ways of becoming friends with people, including living near each other, working together, attending sporting or religious events together, and volunteering on committees. They also varied on reasons for being friends; though there was a focus on providing help to one another, people also discussed being friends with someone because of shared interests, love for each other, or to maintain other mutual connections.

After participants provided the number of friends in a village, they provided an identifier (e.g., first name, nickname, or initials) for each friend. Because of privacy concerns, we did not ask for information that could identify the friend; beyond an identifier, we asked only about the friend's gender and religion. From the lists of friends, ODK randomly selected one friend from the focal village and one friend from another village for follow-up questions about characteristics of the friendship and the help the participant had received from the friend. Participants were first asked about the friend in the focal village and questions were always asked in the same order. Fifty-five participants were not residents of the focal village. For these participants, the survey still randomly chose a friend from the focal village and another village; however, friends from the focal village were categorized as long-distance, as we only categorized friends as close-distance if they and the participants lived in the same village, so that some participants provided responses about two long-distance friends. There were 838 observations of close-distance friends and 571 observations of long-distance friends.

## 2.4. Measures

### 2.4.1. Help received from friend

We asked participants what kind of help they had from one randomly-chosen friend in the focal village and one the distant village, including whether at any time in the past their friend had ever given or loaned them greater than 10,000 TSH. We specified an amount greater than 10,000 TSH because people are expected to help their neighbors in need by providing a few thousand shillings; per pilot work in the Lindi and Pwani Regions of Tanzania, 10,000 TSH is usually gifted and loaned only between family and friends. From our sample, we estimated 10,000 TSH to be about three days worth of income. Loans between friends in this context are almost always interest-free.

When participants said a friend helped by giving or loaning money, we asked follow-up questions about the largest amount of money given or loaned, what that gift or loan was for, and how frequently participants received gifts or loans from the friend. For frequency, the response options were monthly, seasonally, yearly, or less than once a year. Participants gave free response answers to what the gift or loan was for, which we coded into categories prior to analysis.

In addition to asking about cash transfers, we also asked participants if they had received other forms of help from their friend, including food, advice about business or life, tools, information about work, help with finishing work, help with housework, or care while sick. We focus on help as cash transfers for three reasons: First, cash transfers are comparable across distances; for example, transferring cash via mobile banking is no more difficult for close- and long-distance friends, but providing help in terms of labor or delivering a physical good is more difficult for long-distance friends. Second, cash transfers are more likely to be clearly stated as a gift or a loan, whereas other forms of help are not. Third, according to our ethnographic and pilot research, other forms of help, such as providing food or helping with housework, are expected of neighbors even if they are not friends, whereas large cash transfers are only given between kin and friends.

### 2.4.2. Meeting frequency

We asked participants how often they see each other face-to-face, with response options of daily, every other day, weekly, monthly, seasonally, yearly, and less than once a year.

### 2.4.3. Belong to same religious institutions

We asked participants their religion and the religion of their friend; if they practiced the same one, we considered them co-religionists. We also asked whether they and their friend attend the same mosque or church.

### 2.4.4. Profession

We asked participants what their profession in the fishery was. Options for profession were fisher, captain, boat owner, processor, trader, agent (someone who buys and transports fish, usually sardines, on behalf of an investor or company), seaweed farmer, and other. Other responses were grouped into gleaner (collects seashells on the shore), fishery support (primarily unloading and carrying fish), owning a non-fishery business, and other (too few responses to make their own category). Participants could choose all options that applied to them, though we assigned participants a primary profession for analyses based on observations that some professions were likely to be ancillary to others. For example, some traders stated they also processed their own fish ( $n = 11$ ), but did not often process fish for others, so we assigned people who were traders and processors as traders. See Table S2 in the supplementary for the number of different combinations of professions and how they were categorized.

### 2.4.5. Wealth

We asked participants whether their household had amenities and market items that are associated with wealth in the local context (see Supplementary Material). We used multiple correspondence analysis (MCA) to compute wealth scores using factoextra version 1.0.7 (Kassambara & Mundt, 2020), imputing missing data for wealth using missMDA version 1.18 (Josse & Husson, 2016). MCA reduces multiple categorical variables to fewer dimensions and is the nominal counterpart to principal component analysis. Missing data were imputed by iteratively estimating the dimension loadings and using those loadings to estimate the missing values. See Table S1 and Fig. S1 in the supplementary materials for descriptive statistics. The first two dimensions accounted for 59.5% of the variance in the data (see Fig. S2), and we extracted wealth scores from these dimensions; items related to housing construction loaded higher on the first dimension (41.0%), and items related to owning appliances loaded higher on the second dimension (18.5%) (see Fig. S3).

## 2.5. Data analyses

We analyzed the data using Bayesian multilevel regression models. We estimated whether someone receives a gift or a loan (*presence*) and the max amount received (*max*) using a hurdle-lognormal likelihood, and we estimated the frequency of receiving a gift or a loan (*frequency*) using an ordered categorical likelihood.<sup>2</sup> For each measure, we fit two models, a baseline model estimating the total effect of distance on receiving help and a full model estimating the direct effects of frequency of interaction and belonging to the same religious institution on receiving help. We included in the models the participant's gender, age, profession, and wealth; the only information about the nominated friend

<sup>2</sup> We preregistered that we would analyze the frequency of receiving help including participants who did not receive help by imputing "never" as a response. However, we deviated from the preregistration and analyzed responses only for participants who had received help; because of the low probability of receiving help, this analysis was redundant with the analysis of the probability of receiving help. The frequency analysis then is the frequency of receiving help, conditional on having received some help before.

included in the model was the random intercept of their residence. All variables were estimated as interactions with the form of help, so that separate parameters for each effect were estimated for gifts and loans. Gender, profession, and distance were estimated specifying the effects as varying intercepts, and wealth and age were estimated as continuous effects. In the full models, frequency of interaction and belonging to the same religious institution were estimated as monotonic effects. The models included random intercepts for participant, participant's residence, alter's residence, and fishery. We specified weakly regularizing parameters to assist in computation.

To test our predictions, we computed difference scores between estimates for gifts and loans within each distance of friendship, and then we computed the difference between close- and long-distance friends in these difference scores, producing posterior distributions of a difference-in-difference score. Positive values in these scores indicate that help between close-distance friends is more characterized by gifts than loans compared to long-distance friends, which would support our predictions. For probability of receiving help (*presence*), we computed values on the probability scale with all other effects but the intercepts removed and we report model results as probability of having received a gift or loan before. For shillings received (*max*), we computed values on the log- $\mu$  scale with all other effects but the intercepts removed, but we exponentiate and then report the values as shillings (rounded to the nearest hundred). For frequency of receiving help (*frequency*), we report the model results as differences in the log-odds—that is, we do not transform the values. We report other effects from the models in the supplementary materials.

To summarize the posterior distributions, we report the median of the distribution, the 90% highest density interval (HDI), the proportion of the posterior that is positive (probability of direction, *pd*), and the evidence ratio (*ER*), which is the proportion of the posterior that is positive relative to the proportion of posterior that is negative. We label evidence ratios of  $>1.00$  and  $<3.00$ ,  $>3.00$  and  $<10.00$ , and  $>10.00$  as anecdotal, moderate, and strong evidence, respectively, *for* the predictions, and evidence ratios of  $<1.00$  and  $>0.33$ ,  $<0.33$  and  $>0.10$ , and  $<0.10$  as anecdotal, moderate, and strong evidence, respectively, *against* the predictions. These labels are provided as heuristics and evidence should be interpreted continuously.

We analyzed the data in R version 4.1.1 (R Core Team, 2021), using the brms version 2.17.0 (Bürkner, 2017, 2018) and cmdstanr version 0.4.0 (Gabry & Cešnovar, 2021) packages to fit the Bayesian models and the tidybayes version 2.3.1 (Kay, 2020) package to summarize the models. We used the tidyverse version 1.3.1 (Wickham et al., 2019) package for data wrangling and visualization.

## 2.6. Ethics and transparency

We preregistered data collection on Open Science Framework at <https://osf.io/bvryt>, and after data collection but prior to analysis, we preregistered our analyses at <https://osf.io/skpwa>. Materials, anonymized data, and code are publicly available at <https://osf.io/8b9zk/>. The study was declared exempt from ethical approval by the Institutional Review Board at Washington State University and permission to conduct research in Tanzania was provided by the Commission for Science and Technology. Local government officials welcomed the research team in each village and participants provided verbal consent to participate.

## 3. Results

Overall, while participants were generally less likely to receive help from long-distance friends than close-distance friends, the kind of help received was similar, regardless of distance (Fig. 2). The most common forms of help from friends were providing advice and providing care while sick. Help in the form of cash, whether as a gift or a loan, was uncommon between close- and long-distance friends.

### 3.1. Participants were more likely to have received a gift than a loan from long-distance friends

Inconsistent with our hypothesis, gifts were less common than loans from close-distance friends, whereas from long-distance friends, gifts were more common than loans (close-distance:  $\delta p = -0.10$ , HDI:  $-0.20$ – $0.00$ , *pd*: 0.048, *ER*: 0.05; long-distance:  $\delta p = 0.04$ , HDI:  $-0.03$ – $0.11$ , *pd*: 0.837, *ER*: 5.13). The difference between the probability of having received a gift or a loan was smaller for close-distance friends than long-distance friends,  $\Delta\delta = -0.14$ , HDI:  $-0.20$  to  $-0.07$ , *pd*: 0.001, *ER*: 0.00. See tables S4 and S5 for effects of profession and demographics. Participants who received help from their friend in one form received help from their other friend, regardless of distance, with one exception: participants who received gifts from their friend were not more likely to have received a loan (see Fig. 3). In general, the correlation between having received one kind of help and receiving a cash transfer was similar whether the transfer was a gift or loan, though the correlation between being given a place to stay and receiving a gift was notably larger than the same correlation with receiving a loan. Correlations did not notably differ between close- and long-distance friends (see Figs. S4 and S5).

### 3.2. Participants received larger loans from long-distance friends and gave loans mostly for business investments

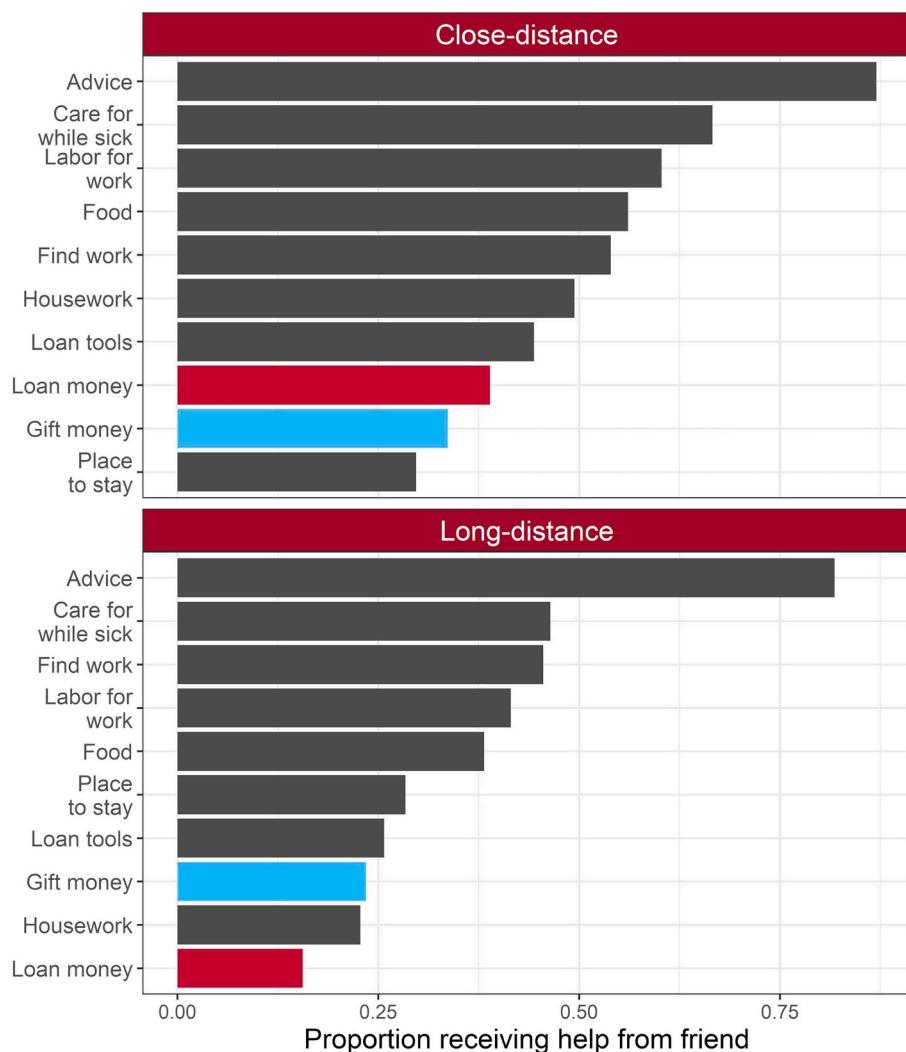
Participants who had received a gift or a loan from their friend reported the largest gift or loan they had received and what the help was for. In mixed support of our hypothesis, the maximum size of gifts and loans received from close-distance friends were similar (see Fig. 4), whereas the largest gifts received from long-distance friends were smaller than loans (close-distance:  $\delta\mu = -200$ , HDI:  $-12,100$ – $8500$ , *pd*: 0.468, *ER*: 0.88; long-distance:  $\delta\mu = -5000$ , HDI:  $-21,400$ – $3700$ , *pd*: 0.142, *ER*: 0.17). There was moderate evidence that there was more discrepancy in maximum gift and loan amounts for long-distance friends than for close-distance friends,  $\Delta\delta = 5300$ , HDI:  $-1500$ – $14,000$ , *pd*: 0.908, *ER*: 9.93. See tables S6 and S7 for effects of profession and demographics.

However, this difference in maximum size of gifts and loans is due to differences in reasons for receiving gifts and loans. The top three reasons for receiving a gift or a loan are general or unspecified help for a participant's household, capital investment or replacement for their business, and healthcare or assistance while sick or injured (see Fig. 5). Gifts were given primarily to help the household, whereas loans were given primarily for business investments. For long-distance friends, nearly half of all the loans were for business investments. Notably, gifts and loans for businesses were larger than gifts and loans received for other reasons, regardless of distance (see Fig. S6). Once the reason for receiving help is included in the model, the evidence for a difference in gift and loan size between long-distance friends is only anecdotal,  $\delta\mu = -1500$ , HDI:  $-11,900$ – $3400$ , *pd*: 0.258, *ER*: 0.35.<sup>3</sup>

### 3.3. Participants received gifts more frequently from close-distance friends than long-distance friends

If they had ever received either a loan or a gift from their friends, participants received help more frequently from close-distance friends than long-distance friends (Fig. 6). Consistent with our hypothesis, there was anecdotal evidence that among close-distance friends, gifts were more frequent than loans, and there was anecdotal evidence that gifts were less frequent than loans among long-distance friends (close-distance:  $\delta\beta = 0.12$ , HDI:  $-0.51$ – $0.81$ , *pd*: 0.648, *ER*: 1.84; long-distance:  $\delta\beta = -0.10$ , HDI:  $-0.84$ – $0.64$ , *pd*: 0.389, *ER*: 0.64). There was

<sup>3</sup> This analysis was not preregistered and was conducted after exploratory analyses.



**Fig. 2.** Proportion of participants receiving each form of help from their close- ( $n = 838$ ) and long-distance ( $n = 571$ ) friend. Helping by gifting money and loaning money are highlighted in blue and red, respectively. (For interpretation of the references to colour in this figure legend, the reader is referred to the web version of this article.)

moderate evidence that the difference in frequency between gifts and loans was larger for close-distance friends than long-distance friends,  $\Delta\delta = 0.22$ , HDI:  $-0.34$ – $0.83$ ,  $pd: 0.755$ ,  $ER: 3.08$ . See tables S8 and S9 for effects of profession and demographics.

To summarize, close-distance friends were more likely to help and to help more frequently than long-distance friends — although if close-distance friends had ever helped, they were more likely to have offered help as a loan rather than a gift, *but* with a maximum loan size smaller than those offered by long-distance friends. If long-distance friends had ever helped, they were more likely to have done so with a large loan; however, this was because long-distance friends were more likely to give a loan for a capital investment in business, which across friendship categories were larger than gifts and loans given for other reasons. Participants received help more frequently from close-distance than long-distance friends, and there was some evidence that this difference in frequency of helping was larger for gifts than loans.

#### 3.4. Participants received help more frequently from friends they meet more often

We suggested that long-distance friends would favor giving help as a loan rather than a gift because they meet less frequently, making monitoring for defections difficult. If true, then friends who meet less

frequently, regardless of distance, should be more likely to give help as loans rather than gifts. Close-distance friends met more frequently than long-distance friends (see Fig. S7). 82.7% of participants reported meeting their close-distance friend daily, whereas 78.1% of participants reported meeting their long-distance friend weekly or less frequently. There was strong evidence that friends who met more frequently received gifts and loans with a greater frequency (see Fig. 7), but anecdotal evidence for any effect on having received a gift or loan at all or the size of the maximum gift or loan received (see Table 1). There was anecdotal evidence that meeting frequency had a larger effect on gifts than loans,  $\delta\beta = 0.08$ , HDI:  $-0.19$ – $0.33$ ,  $pd: 0.694$ ,  $ER: 2.27$ .

#### 3.5. Participants who attended the same mosque as their friend received help more frequently

We also suggested that long-distance friends would favor giving help as a loan rather than a gift because they lack shared cooperative institutions to mediate disputes, such as belonging to the same religious congregation. If true, then friends who do not belong to the same congregation, regardless of distance, should be more likely to give help as loans rather than gifts. Close-distance friends were more likely to be members of the same congregation than were long-distance friends (see Fig. S8). 64.4% of participants reported attending the same mosque or

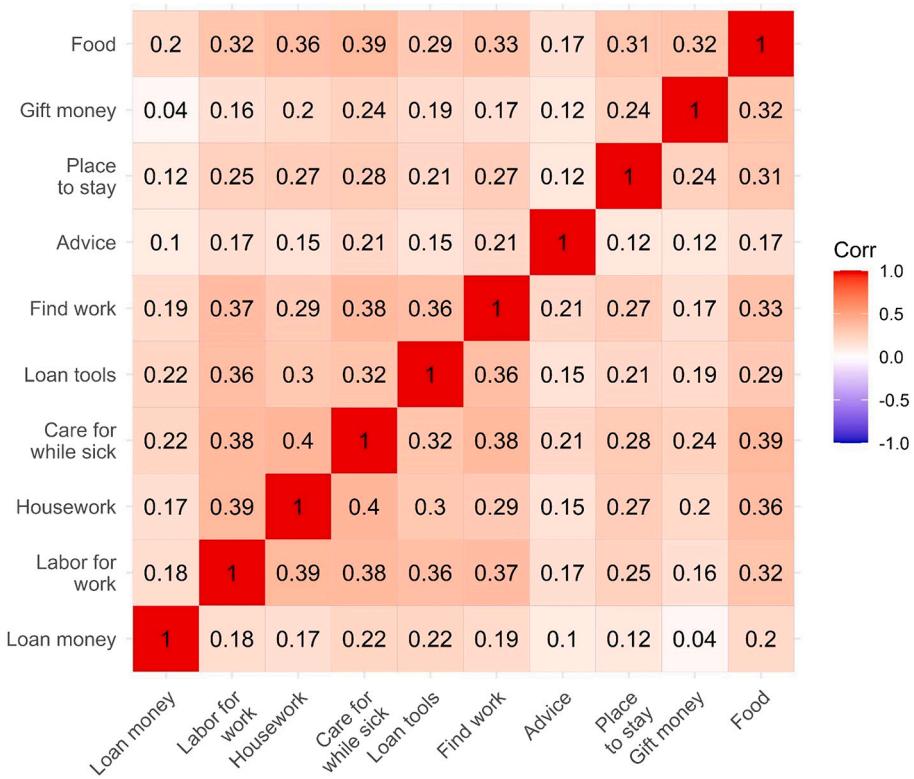


Fig. 3. Correlations between receiving different kinds of help collapsed across close- and long-distance friends.

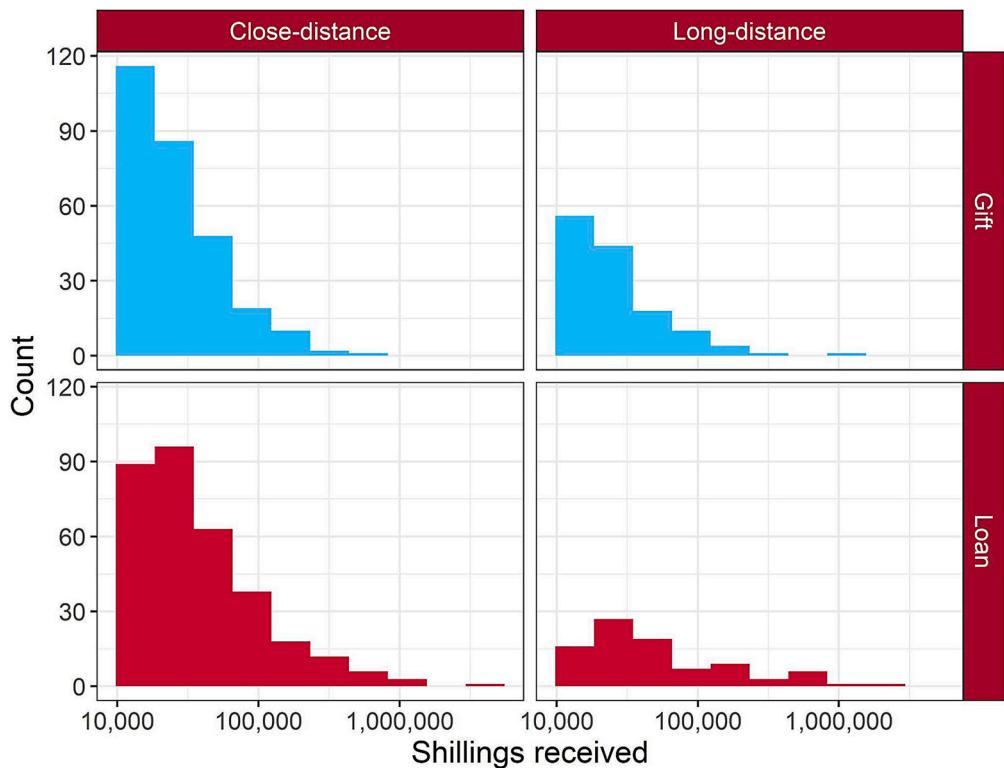


Fig. 4. Maximum amount of shillings received as help in the form of a gift and a loan from close- ( $n = 838$ ) and long-distance ( $n = 571$ ) friends. Amount of shillings received is on the log-scale. Responses from participants who did not receive a gift or a loan are excluded here.

church as their close-distance friend, whereas only 11.0% of participants reported attending the same mosque or church as their long-distance friend. However, close- and long-distance friends were similarly likely

to be in the same religion; 8.3% of participants reported being in a different religion from their close- and long-distance friends.

There was strong and moderate evidence that participants that share



Fig. 5. The reasons given for receiving a gift or loan from close- ( $n = 838$ ) and long-distance ( $n = 571$ ) friends.

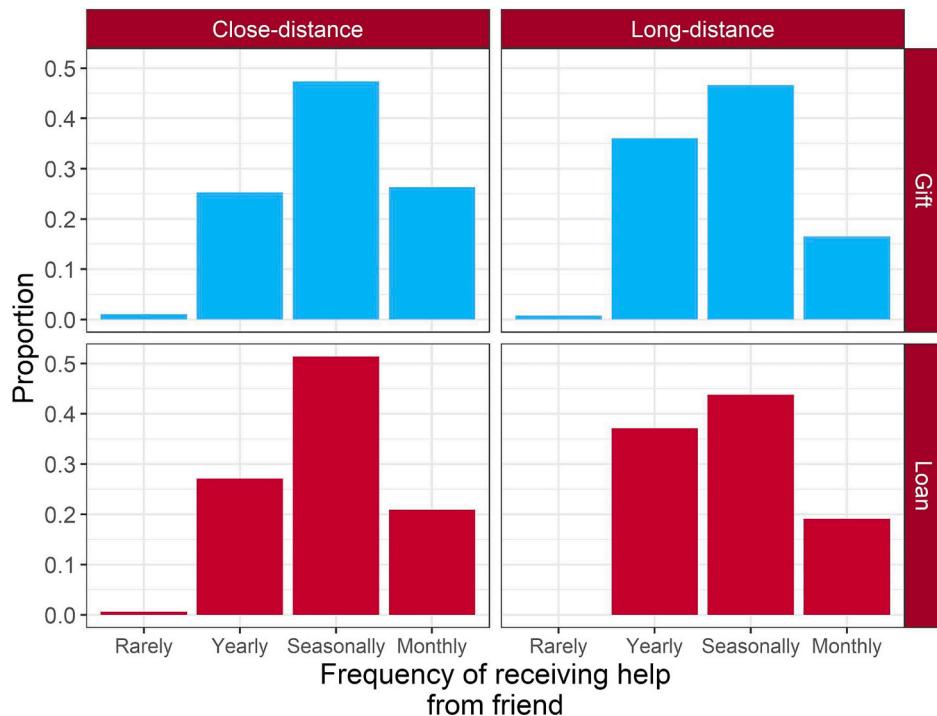
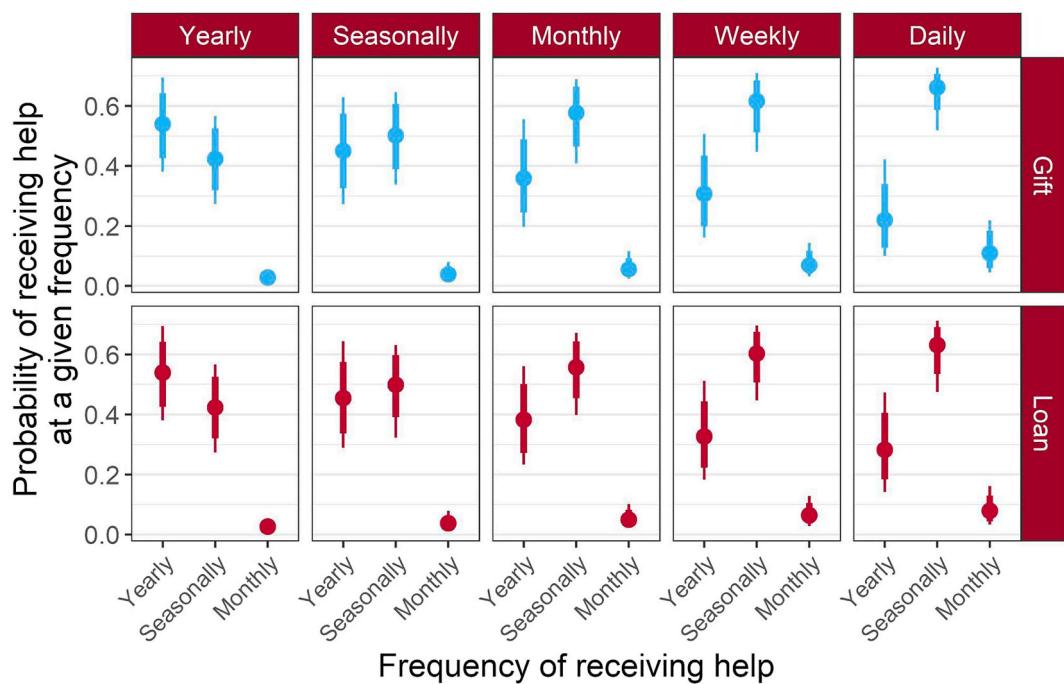


Fig. 6. Frequency of receiving help in the form of a gift and a loan from close- and long-distance friends. Responses from participants who did not receive a gift or a loan are excluded here (gifts from close-distance friends  $n = 281$  and long-distance friends  $n = 133$ , loans from close-distance friends  $n = 325$  and long-distance friends  $n = 89$ ).

the same religious institution with their friend were more likely to have received a gift or a loan, respectively (see Table 2), and there was strong evidence that participants that share the same religious institution with their friend received a larger maximum loan size. However, these differences were largely between having a different religion and having the same religion (see Figs. S9 and S10), which close- and long-distance

friends did not differ on because most people on the coast are Muslims. There was moderate and strong evidence that participants that belonged to the same religious institution as their friend received gifts and loans more frequently, whether they were members of the same religion or even the same congregation (see Fig. 8). There was moderate evidence that sharing the same religious institution had a smaller effect



**Fig. 7.** Probability of receiving gift or a loan at each frequency by meeting frequency across panels. Estimates for responses of “rarely” are not shown here for clarity (the median estimate for this response option in each panel was 0).

**Table 1**  
Posterior summary of the effect of meeting frequency on receiving help.

Outcome	Help	Median	90% HDI	pd	Evidence ratio
Received	Gift	-0.04	-0.14–0.06	0.248	0.33
	Loan	0.04	-0.07–0.15	0.721	2.58
Amount	Gift	-0.02	-0.10–0.06	0.330	0.49
	Loan	-0.04	-0.12–0.04	0.204	0.26
Frequency	Gift	0.36	0.16–0.57	0.998	554.56
	Loan	0.28	0.07–0.50	0.988	79.00

*Note.* Values are posterior estimates of the coefficient of meeting frequency. Coefficients are the difference between meeting daily and meeting yearly on each different outcome variable.

**Table 2**  
Posterior summary of the effect of sharing the same religious institution on receiving help.

Outcome	Help	Median	90% HDI	pd	Evidence ratio
Received	Gift	0.20	-0.04–0.42	0.915	10.75
	Loan	0.10	-0.07–0.29	0.827	4.78
Amount	Gift	0.02	-0.14–0.17	0.606	1.54
	Loan	0.11	-0.02–0.25	0.917	11.08
Frequency	Gift	0.21	-0.20–0.63	0.803	4.09
	Loan	0.43	0.11–0.76	0.987	73.07

*Note.* Values are posterior estimates of the coefficient of meeting frequency. Coefficients are the difference between attending the same mosque and having a different religion on each different outcome variable.

on gifts than loans,  $\delta\beta = -0.23$ , HDI:  $-0.72$ – $0.26$ , pd: 0.223, ER: 0.29.

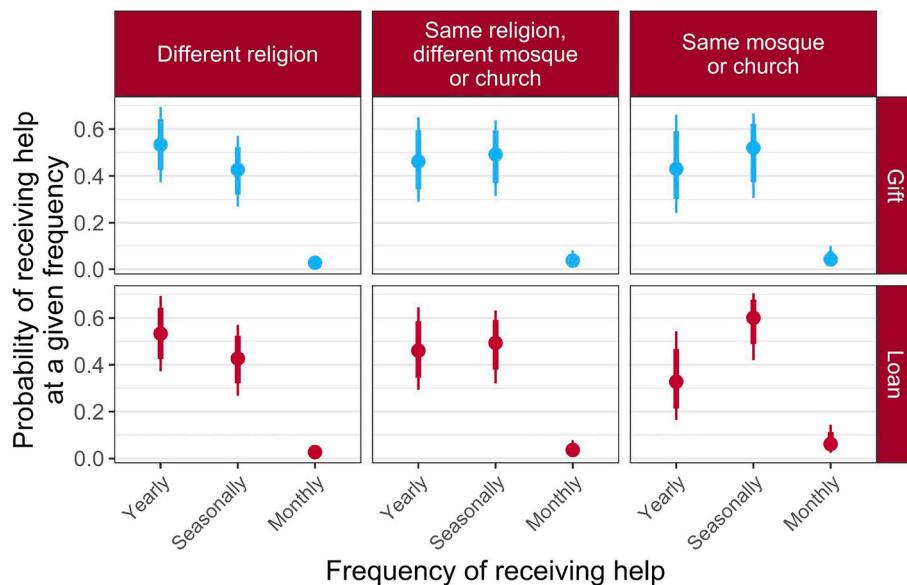
#### 4. Discussion

Making friends is an important strategy humans use to manage the risk of shortfalls. Though people often form friendships with individuals they are physically close to (Preciado, Snijders, Burk, Stattin, & Kerr, 2012; Rubin & Shenker, 1978), many people also choose to invest in forming and maintaining friendships with individuals living further

away (Pisar & Ross, 2022). While long-distance friendships are useful for managing risk, especially by providing access to non-local resources or buffering shortfalls that affect a person’s entire community (Bollig, 2006; O’Shea, 1981; Pisar & Jones, 2021; Wiessner, 1977), compared to close-distance friends, long-distance friends are less likely to interact frequently and share cooperative institutions, which may translate into greater risk of exploitation. Despite their distinct potential benefits and costs, long-distance friends are often lumped with close-distance friends in the friendship literature or are ignored entirely (Hruschka, 2010; Johnson, Becker, Craig, Gilchrist, & Haigh, 2009; Policarpio, 2016). Focusing on these potential costs, we hypothesized that given increased risk of exploitation, long-distance friends would make their help contingent on being repaid; specifically, that long-distance friends would be more likely to offer loans rather than gifts, especially compared to close-distance friends.

We found partial support for our hypothesis. Among fishing villages in northeastern Tanzania, people received more help generally from close-distance than long-distance friends, but when people did receive help from long-distance friends, it was more likely to be in the form of a gift rather than a loan. However, long-distance friends were more likely to give less frequent but larger loans than were close-distance friends, which were mostly for business investments. People received help more frequently from close-distance friends than from long-distance friends, with evidence to suggest this was especially true for gifts rather than loans. Regardless of distance, however, people who met with their friends more frequently or attended the same congregation as their friend received gifts and loans from them more frequently.

We suggest that in the context of these fishing villages, long-distance friendships are especially important for accessing large cash infusions for capital—resources local community members may not be able to provide in full—and because of this, loans are infrequent, but large, between long-distance friends. As a case in point, not only were business investments the most named reason for receiving a loan, but capital intensive professions, such as boat owners and traders, were more likely to have received a loan and received a larger maximum loan size. For example, the minimal cost for an outrigger canoe (*ngalawa*) is 2,000,000 TSH, larger than almost every loan amount reported by participants, and



**Fig. 8.** Probability of receiving gift or a loan at each frequency by shared religious institution. Estimates for responses of “rarely” are not shown here for clarity (the median estimate for this response option in each panel was 0).

we suspect that long-distance friends are asked to provide loans in such cases because the capital must be pieced together from multiple sources, including long-distance friends. Another possibility is that, because loans are larger, people are more willing to give loans to people they can monitor more easily, such as close-distance friends; people may give long-distance friends gifts instead, and only when they can afford not to be repaid, and simply opt not to provide any help if they can only provide it as a loan.

As business loans are infrequent, given their size, perhaps it is unsurprising that gifts are more common than loans among long-distance friends, contrary to our hypothesis—but third variables are also potentially relevant to this pattern. First, in general, friends are less likely to keep close track of imbalances in helping (Xue & Silk, 2012), potentially inflating the frequency of gifting for both close- and long-distance friends. This could be exacerbated because we did not specify any time anchors of when they had received help, which can lead to less reliable recall of past social behavior (Adams, Madhavan, & Simon, 2006; Redhead, McElreath, & Ross, 2022). Second, when loans are unpaid among friends, they may become de facto gifts and be reported as such. Similarly, reporting outstanding debts can be a sensitive subject, and participants may have reported loans as gifts to avoid an embarrassing disclosure. Third, frequency of both kinds of help—gifting and loans—may be inflated among friends that interact frequently or are part of the same congregation not because defection is more difficult, but because people likely ask for help from the most easily available friends, which would be friends they see frequently or in worship. Fourth, we did not have data on the characteristics of the nominated friend; their attributes, such as their wealth, or similarities between the participant and friend likely also influence the reported help received.

To these points, perhaps more striking than the differences between close- and long-distance friends was how similar they were. While we find that close-distance friends are more likely to and more frequently provide help than long-distance friends, the kind of help and the reasons for helping are broadly similar. Friends, regardless of distance, mostly help by providing advice and help when sick, and when they provide cash as a gift or loan, do so to help with household, healthcare, and business costs. Anthropologists have discussed the role of long-distance relationships in risk-buffering before, but have mostly emphasized ritual relationships, such as the *hxaro* in the San (Wiessner, 1977) or *osotua* in the Maasai (Cronk, 2007), in which institutions reinforce cooperation within these relationships (Pisar & Surbeck, 2019). Our data suggests

that even absent such institutions reinforcing cooperation, forming long-distance relationships is an important supplement to close-distance relationships for managing risk. That long-distance friendships can be as robust as close-distance friendships as a form of help is especially important in developing countries, where mobile banking and connections across communities are important sources of aid (Fafchamps, 1992; Fafchamps & Lund, 2003; Riley, 2018).

While we find many similarities between close- and long-distance friends, using observational data of existing relationships may censor our data such that we underestimated the differences between close- and long-distance friends. Specifically, we did not ask about friendships that had dissolved, possibly because of failure to repay loans. If long-distance friends are less likely to pay back loans and/or less tolerant of failures to repay, then the long-distance friendships we asked about were ones that either were less likely to have asked for a loan or were friendships that were particularly strong. Alternatively, it is possible that some of the gifts reported by participants were originally loans they failed to pay back that were forgiven and later called a gift. These processes could make help between close- and long-distance appear more similar than they really are. Future research examining longitudinal dynamics in friendships, friendship dissolutions (Vieth, Rothman, & Simpson, 2022), or using hypothetical scenarios (Clark, 1981; Shackelford & Buss, 1996) may reveal more differences between close- and long-distance friendships.

A surprisingly large number of participants, over 10%, were excluded because they reported having no friends. In a few interviews, participants elaborated on why they have no friends; we highlight two of the most common reasons here. First, some participants, usually older women, complained that no one wanted to be their friend. One possibility is that these people provide few benefits to potential friends and are more likely to need help than provide help (Tooby & Cosmides, 1996). Instead, these people likely get help either from kin or from the community at large, as there is an expectation that neighbors provide small forms of help when their neighbor is in need. Second, a small number of participants, usually people with successful businesses, insisted they did not want friends because friends are obligations and just take from them; instead, they rely on business relationships and deals during shortfalls. Examining when people choose to form any friendships and how people balance the obligations that come with friendships could be an avenue for future research.

While we focused our analyses on help provided as cash transfers,

this was an uncommon form of help between friends in our sample. Rather, friends were more likely to receive help in the form of advice, care while they were sick, and help with finding or completing work, regardless of whether they were close- or long-distance friends. Even when receiving help as cash, it was often to help with accessing healthcare. This is not surprising; illness and injury are common sources of shortfalls across societies, and help as insurance against these shocks was likely especially important over human evolutionary history (Sugiyama, 2004; Sugiyama & Scalise Sugiyama, 2003). Friendships can also serve other functions beyond providing material resources or care, such as providing support in conflicts (DeScioli & Kurzban, 2009; Patton, 2005; Redhead & von Rueden, 2021) or sharing social information (Dunbar, 2004; Hess, 2022). Though our data do not speak to these functions, there is evidence from other work that long-distance friendships can provide both support in conflicts (Singh & Glowacki, 2022) and information access (Ross & Atkinson, 2016); the extent to which close- and long-distance friends differentially serve these functions, and in what contexts, should be a focus of future work.

Consistent with the larger literature, we found suggestive evidence that friendship intensity decreases with distance, but that—as is true for close-distance friendships—frequent interactions and shared institutions promoted helping, presumably by facilitating monitoring and reducing transaction costs. What is striking and novel, however, is how similar close-distance and long-distance friendships are—and where they differ, they appear to do so because long-distance friends meet a key need: sustaining or advancing businesses. This indicates that long-distance friends are an important source of help along the coast of Tanzania and that long-distance friendships are a robust strategy for managing risk and accessing resources.

## Funding

This work was supported by the National Science Foundation (#2020501). The funder had no role in study design, data collection, analysis, and the writing of the manuscript.

## Data availability

Materials, de-identified data, and code are available at <https://osf.io/8b9zk/>.

## Declaration of Competing Interest

None.

## Acknowledgments

We thank Mwambao Coastal Community Network, WWF Tanzania, Blue Ventures, Khamis Juma, Ibrahim Mabulla, Haji Machano, Jairos Mahenge, Modesta Medard, Jumanne Mohammed, Julitha Mwangamilo, Jason Rubens, Lorna Slade, and Ali Thani for their guidance, help, and feedback. We also thank Aaron Lukaszewski, Jessica Ayers, and an anonymous reviewer for thoughtful and constructive comments during the review process.

## Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.evolhumbehav.2022.09.004>.

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