Postdisaster reciprocity and the development of inequality in personal networks

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Abstract:

Within the context of major changes in economics, population distribution, and lifestyles around the world, people continue to rely on personal relationships for support. People also often create or find themselves in relationships that are alternatively asymmetrical or balanced. In this study, we are interested in how people face acute or chronic hazards and how asymmetrical or balanced exchange relationships are associated with different types of social support in these contexts. This study examines the degree to which populations in three disaster settings–flooding in Mexico and volcanic eruptions in Mexico and Ecuador–show variation in the degree and form of reciprocity. We found people on average to engage in giving and/or receiving with three to five people in their personal networks. Most of these relationships were reciprocal, but those that were not reciprocal suggested potential inequality in these rural communities.

Keywords: Labor | Exchange | Social support | Hazards | Social network

Article:

In the immediate aftermath of any large-scale disaster, the world is often fascinated and uplifted by stories of mutual support and assistance. These narratives become the human interest sagas of the local, national, and international press, particularly in those situations where government authorities seem unable to deal with the immediate aftermath of the event. Policy makers focusing on this aspect of immediate postdisaster behavior have begun using such terms as *resilience* to account for recovery and to imply that communities showing resilience are more likely to recover from extreme events with even stronger and more democratic economies. The inverse, though hinted at, is seldom clearly articulated—that communities with little resilience lack the community spirit of sharing and, by implication, are the cause of their own failure.

Here we present some of the results of our studies of social support among disaster-affected and resettled peoples in Mexico and Ecuador. Very little work has been done to look at the long-term nature of exchange and mutual assistance in disaster settings. There is a general lack of attention

to what happens a year after or further out from the event and how postevent recovery strategies by governments and nongovernmental organizations (NGOs) actually serve to perpetuate existing inequalities and class structures. In this article, we examine reported exchange relationships in chronic and acute disaster settings. One goal was to see if differences exist in the nature of exchange in highly impacted versus less impacted sites, but we also are concerned with some other major contextual differences (e.g., Ecuador vs. Mexico, rural vs. urban, resettled vs. nonresettled) as we explore the extent to which exchange between individuals relying on different kinds of personal networks serves to perpetuate an existing class structure since class structure is a major component of recovery opportunities and constraints.

Reciprocity and exchange in the economic anthropology of Latin America

Mexico's urban poor have used social networks to buffer themselves against poverty and lack of access to political power (Gonzalez de la Rocha 1999; Lewis 1952; Lomnitz 1977; Reyes Morales 1999; Velez-Ibañez 1983), although often with limited scope and duration (Lloyd 1980; Morris 1991; Schmink 1984; Selby et al. 1997; Winter et al. 1990). Urban Mexico has a tradition within politics, unions, student groups, and so on, of strong institutional loyalty and structured hierarchy (Lomnitz 1982), and thus helping behaviors are not only generated among informal networks of friends, families, and neighbors but also derive from membership in a formalized group or movement (Adams 1975; Velez-Ibañez 1983). Regardless of the source and intensity of helping behaviors, anthropological research in general maintains that social networks are fundamental to community formation and community survival in Mexico (Greenberg 1989; Murphy and Stepick 1991; Murphy et al. 1996; Nutini 1968; Prince and Murphy 1990; Selby et al. 1990). How responsive are these traditional social networks in the case of a natural disaster or other extreme event, and are there particular structural aspects of these traditional social networks that influence their responsiveness? Does the homogeneity of many Mexican communities hinder effective recovery, or help? How does this compare to another Latin American country, such as Ecuador, where reciprocal exchange practices are central to Andean economic and cultural practice and often adapted to forge and maintain bonds of mutual obligation between different class strata (Mayer 2002; Whitten 1969)?

The role of reciprocity and exchange in the survival of poor urban and peasant households has long been the subject of anthropological inquiry (Bott 1957; Gonzalez de la Rocha 2001; Lomnitz 1977; Stack 1973; Susser 1982). The establishment of alliances for the exchange of labor, services, goods, and money among members of the urban poor and peasant farmers is well established. Lomnitz (1977) described networks that allowed the urban poor living at the margins of the emerging capitalist system of Mexico to survive under conditions of extreme poverty and political oppression. She later demonstrated how similar networks are used by elite families to maintain their position of economic and political hegemony (Lomnitz 1987). Carlos Velez-Ibañez (1983), in his study of Mexico City, demonstrated not only that it was the poor, as described by Oscar Lewis (1959), who relied on extensive contacts and connections to survive in the favelas but that in the emerging urban and political complexity in Mexico City in the third quarter of the 20th century, exchange in the form of political and economic support was critical to the emerging working middle class of such areas as Nezahualcoyotl. He later demonstrated how informal credit networks (tandas) operated as systems of generalized reciprocity that help

lower- and middle-class households across vast distances improve their lot in life (Velez-Ibañez 1988).

Lomnitz (1977) argued that reciprocity is a system of exchange of goods and services in which (1) exchange develops as part of a social relation, (2) reciprocal exchange continues beyond a single transaction, and (3) it is not highly constrained by the law of supply and demand. She argued that generosity is not primarily a moral imperative but a response to economic need characterized by continually balanced scarcity. She sums up the emic characterization of this tentative balance of responsibility in goods, services, favors, and information in a context of need with the Spanish saying "hoy por ti, manana por mi" (your turn today, my turn tomorrow), a phrase often used by our own Ecuadorian interviewees. The emic understanding of the mutual act of trusting that the other person will continue to have the need, capacity, and desire to maintain the reciprocal exchange she labels with the word confianza (trust).

It is worth pointing out, however, that while Lomnitz (1977) argued that reciprocity is not highly constrained by supply and demand, research on social support exchanges in disaster contexts has found evidence that volunteerism from core networks is frequently followed by a decrease in availability of support and an increase in conflict and weakened social networks (cf. Norris et al. 2004). This may be the result of shared scarcity across a similarly affected network (e.g., everyone in a village has suffered losses in disaster), which could entail a simultaneous increase in demand and decrease in supply of available support resources. Similarly, in the 35 years since Lomnitz's landmark work, economic pressures in some of these contexts also may have changed the nature of interpersonal exchange and reciprocity.

Nutini (1984) and others (Carlos 1973; Mahar 2010; Murphy and Stepick 1991; Sault 1985; Smith 1984; Stephen 1991) have described how the institution of compadrazgo (ritual coparenthood) is often one used by poorer individuals to create a moral obligation toward them by those of greater wealth and power within the community. Relatives, however, are the preferred source of support and favors; nonetheless, compadres (ritual coparents) can be relied upon in emergencies and typically for major ritual events, such as first birthdays, 15th birthdays of females (quinceañeras), first communion, and baptism. Despite some wealth differences in typical relationships between compadres and among relatives, the vast majority of relations of exchange, mutual assistance, and compadrazgo are between individuals who might be characterized as being within the same income group or class in a community. What is also clear from ethnographic and survey research is that, while the ideology of mutual exchange and support is strong in Mexico and Ecuador—as in much of Latin America—in actuality, assistance and exchange are much less frequent than would be expected. This may indeed reflect the effects of globalization and increased international economic interdependency that have arisen in the years since these articles were published.

The institution and practice of compadrazgo can be quite varied, depending on setting. In their study of the practice in Puerto Rico in the 1950s, Mintz and Wolf (1950) found that reciprocity was quite distinct in an economically heterogeneous highland community versus a more economically homogeneous lowland community of tenant workers. In the highland community, the less wealthy sought out the wealthy as compadres, a strategy they found effective in securing material patronage, while the wealthy participated in it to sustain their political power and

prestige. In the lowland community, the strategy of seeking wealthy patrons as compadres was eschewed in favor of seeking kin to fulfill these roles, as kin were considered more reliable sources of support than the more remote wealthy patrons.

In our previous studies in Oaxaca, Guadalajara, Merida, and Hermosillo (Jones et al. 2011), we found that a limited percentage of the households participated in any type of exchange. Similarly, the "close" Latin American family as described in the literature (Balmori et al. 1984; Gonzales de la Rocha 1994; Jelin 1991; Lomnitz 1977) may exist but is more a function of intermittent necessity and ritual than of a moral sense of obligation to provide everyday support. An extreme example is that, in 100 percent of the cases where children had inherited houses or lots from their parents, the first thing they did was to build a wall to divide the two families.

Lomnitz (1977) found that, despite a general ethic of mutual aid and community support that Mexicans believe to predate Hispanic settlements, people tend overwhelmingly to rely on paid services or on people within their household when building a new house rather than on friends, relatives, or neighbors. To some extent, there is an exception: among people with the highest need, levels of support within and beyond the household go up. Specifically, poorer, larger, less educated and female-headed families are more likely than others to use relatives for labor. Poorer and larger families also are more likely than others to borrow from nonrelatives, and female-headed households are more likely than others to borrow from relatives.

In this article, we explore the nature of exchange between individuals who are of differing and similar class backgrounds, and we investigate the roles of both absolute wealth and perceived relative wealth. We wanted to determine if there are differences in the way people of diverse income groups perceive the flow of economic and social support, particularly in extreme settings. We hypothesized that mutual exchange tends to be asymmetrical between individuals of different classes; the lower group receives aid from the upper group, thus reenforcing the local class structure. When exchange is within a group, relationships are more symmetrical, thus reenforcing ideologies of sameness and mutual struggle, for example, "todos somos humildes" (We are all poor) or "somos tocayos" (we are namesakes) (Higgins 1981; Selby et al. 1990).

Study sites

Our research was conducted in Ecuador and Mexico around two active volcanoes and a landslide/flood area. The primary focus in Ecuador was in the provinces of Chimborazo and Tungurahua, about 120 kilometers south of Quito, an area that has been affected by ongoing ash falls and pyroclastic activity since 1999. The continuing eruptions have had severe impacts on agricultural practices, on economic and business activities, and on the health and well-being of many living in the shadow of the volcano. Several evacuations of populations have taken place, some long term, which led to high levels of stress associated with leaving homes, possessions, livelihoods, friends, and familiar surroundings. In many cases, individuals experience a decline in their health. These physical, economic, and emotional losses have been exacerbated by a loss of faith in both the local and national political leadership and by a struggling national economy (Tobin and Whiteford 2002; Whiteford and Tobin 2009).

This phase of our research began in 2008 and has investigated concerns in a number of communities situated around the volcano (Jones et al. 2013; Tobin et al. 2011; Whiteford et al. 2013). The local social, economic, and political contexts of the study sites and their different disaster experiences present interesting challenges in understanding how wealth, support exchange, and social networks have operated in the recovery process. Discussed here are (1) Penipe Viejo,1 a semi-urban, nucleated village that lies just outside the high-risk zone that has been affected notably through ash falls and consequent devastation of its agricultural hinterlands, has not been evacuated, and has served as a base for emergency shelters and response operations during major eruptions; (2) Penipe Nuevo, which is a new section in Penipe built as a resettlement on a landless urban grid for smallholding rural agriculturalists displaced from a number of northern parroquias in the wake of the 2006 eruptions, consisting of 287 houses constructed by the Ministry of Housing and Urban Development and a multinational, faith-based NGO, Samaritan's Purse; (3) Pusuca, a resettlement community built by the NGO Fundación Esquel five kilometers into the hills south of Penipe, which has 45 houses occupied by smallholding rural agriculturalists displaced primarily from the northern parroquias in the high-risk zone; and (4) Pillate and San Juan, which are two small communities of approximately 40 and 30 households each. These latter two communities have suffered extensive damage as a consequence of heavy ash fall and landslides and been evacuated on several occasions. Despite this, approximately 70 percent of the residents have returned to live in and rebuild the communities in 2009.

In Mexico, we selected two study sites. San Pedro Benito Juarez, a community of 4,340, has been directly affected by the volcano Popocatépetl that lies 11.5 kilometers to the northwest (Tobin et al. 2011). San Pedro Benito Juárez is the closest population to the volcano's cone and is prone to ash fall, volcanic bombs, and pyroclastic flows. While the volcano has been relatively quiet over the last hundred years, it entered a new phase in 1994, when an eruption triggered the evacuation of 75 thousand residents from the region. Eruptions have continued since then, and a large event in 2000 necessitated a second evacuation. Teziutlán, a community of 60 thousand, experienced a mudslide in 1999, following heavy rains and flooding that forced the evacuation and eventual relocation of many residents to a new community. Ayotzingo is a neighborhood within the municipality of Teziutlán, where the Instituto Poblano de la Vivienda purchased four hectares of land on which to build starter homes for relocated families (Norris et al. 2004).

Methodology

We surveyed more than 500 respondents (Egos) in the two countries (245 in Mexico, 261 in Ecuador). Table 1 provides an overview of the sample and some variables of interest, by site, including level of impact, resettled or not, rural or urban, country, and gender.

Site (country)	Disaster impact	Settlement pattern	Pop.	% occupied houses	Time since last evacuation, years	Sample size, men:women
Penipe Viejo (Ecuador)	Low; not evacuated	Urban village	710	79	n/a	19:27
San Pedro Benito Juárez (Mexico)	Low; evacuated	Rural village	3,512	78	7	26:35
Pillate (Ecuador)	High; evacuated	Rural village	193	80	3	26:22
San Juan (Ecuador)	High; evacuated	Rural village	172	88	3	16:14
Pusuca (Ecuador)	High; resettled	Rural village	161	93	3	17:23
Penipe Nuevo (Ecuador)	High; resettled	Urban village	1,405	98	3	45:54
Ayotzingo (Mexico)	High; resettled; deaths	Urban neighborhood	1,609	98	9	42:97

Source . Adapted from Jones et al. (2013).

Table 1. Selected characteristics of study sites

Interview questions elicited information on household, sociodemographic, economic, and well-being characteristics of each respondent and sought to establish detailed personal networks. To construct these networks, each respondent was asked to name 45 people (alters) whom they knew by sight or by name and with whom they had interacted or could have interacted in the past two years (e.g., McCarty 2002). From this list of 45, we randomly selected 25 for further

network analysis based on personal network methodological research by McCarty and colleagues (2007). We asked respondents about each of these 25 people, specifically regarding gender, age, socioeconomic status relative to ego, ethnicity, number of household members, degree of emotional closeness to ego (higher, lower), whether affected by the hazard, last contact with ego, and whether social, personal, financial, or material support had been provided by the alters to ego, or vice versa. Finally, the respondent indicated how much (little, some, a lot) each of the people in his or her personal network interacted with one another from the respondent's perspective.

Wealth

In economic anthropology, quartiles or quintiles are often used to investigate linearity and curvilinearity because people do not usually fall on an ideal line or curve, plus we can more easily examine the behavior of the extremes (i.e., the highest and lowest quintiles). In economic systems, these two extreme groups may have similar behaviors (curvilinear) or different behaviors (linear) to one another but, indeed, are often different than the rest of the sample.

Respondents were separated into wealth quintiles based on a simple count of presence or absence of 26 household items.2 We have used other versions of this approach, including Guttman scaling and counting all items (not just the presence or absence of each item), and there seems to be little difference between the approaches. Another option is to weight each item by value, but Guttman scaling shows that there is good scalability and reproducibility for household items in this sample; thus people are adding specific items as they become more wealthy, obviating the need to put a peso or dollar value on each item.

Quintile 1 represented the lowest wealth level, and quintile 5 is the highest wealth level, although all of these sampled populations have relatively low incomes and socioeconomic status by the national averages in each country. Quintiles were created separately for Mexico and for Ecuador, with typically 47 people per quintile in Mexico and typically 52 people per quintile in Ecuador. In a couple of sites in Ecuador, there was no fifth quintile because the people in that site were not among the wealthiest of the approximately 250 people we interviewed in Ecuador. Although samples from the two countries are not wildly different in absolute wealth, Table 2 shows the distribution of the sample across the quintiles, with Mexico and Ecuador's quintiles calculated separately from the other country.

Quintile	Mexico	Ecuador
1 = Lowest	4.7	3.4
2	8.0	5.6
3	10.1	7.5
4	12.0	9.5
5 = Highest	16.0	13.6
Average	10.1	7.9

Table 2. Wealth quintiles, by average ownership of an of 26 household items

Social scientists who have spent most of their careers in Mexico are often struck by the image that much of the remainder of Latin America's working and lower class has of Mexico from the outside. Derived from the telenovela, they often speak of Mexico as a promised land to the north where work and a good life are available to all. This image is not the one seen by researchers working with women in the maquiladora (Arizpe 1997) or residents of the urban barrio (Guttman 1996; Selby et al. 1990; Velez-Ibañez 1983). Individuals and households in these environments struggle each day in the face of the changing global economy to support themselves and their families.

Nevertheless, looking at the working-class and agricultural populations in our study sites, it is clear that differences in material wealth exist between the two countries. Our goal in this respect was to see how wealth, as measured by material goods, compares between our sites in the two countries. For instance, when joining the two samples, the Ecuador sample ends up most overrepresented in the first (lowest) quintile, whereas Mexico is most overrepresented in the fifth (highest) quintile. It is important to remember that our list of household items did not include high-end electronic goods such as laptops or smartphones.

Exchange

To collect information on exchange activities, we asked respondents to say whether they had received material support from, given material support to, or hired or been hired by each of the 25 people listed in their personal networks. Within each of the binary categories urban versus rural, Ecuador versus Mexico, resettled versus not resettled, male versus female, and high impact versus low impact, we calculated for each respondent the percentage of his or her network members giving or receiving material support and hiring or being hired by others. Hiring can be seen as a form of support, because these are primarily agricultural people who often need cash and typically might only be able to get cash through agricultural labor or through selling their crops. Material support typically included loans of tools, loans of money, and giving food or meals but might also have included gifts of goods or money.

Network type

Each personal network was classified by two researchers into one of four types based on visual analysis. Methodologically, the study of variation in how people visually identify types of networks is relatively new. Kennedy and colleagues (2011) studied nonexperts in network analysis and found people to focus on number of isolated individuals, plus size of the largest groups, as well as density, groups disconnected from others, and small groupings, such as two people connected or three people connected apart from others. As social network researchers, we visually sought approximations of four standard network measures: density, core periphery, components or cliques, and disconnected. We compared each network to a graphic ideal like those in Figure 1: tight (i.e., dense), extending (i.e., core periphery), subgroups (i.e., components, or connected cliques), and sparse (i.e., disconnected, low density). These ideal types were generated from our thoughts about the ways that tight networks versus sparse networks versus networks with groups behave regarding the provisioning of resources. We added the extending category once we began the coding process to capture, in an otherwise tight personal network, the impact of having people who were weakly linked to those other network members. The two researchers discussed the network classification, and if any disagreement prevailed, a secondary network type was assigned to the case. However, only the primary network type is analyzed in this manuscript.

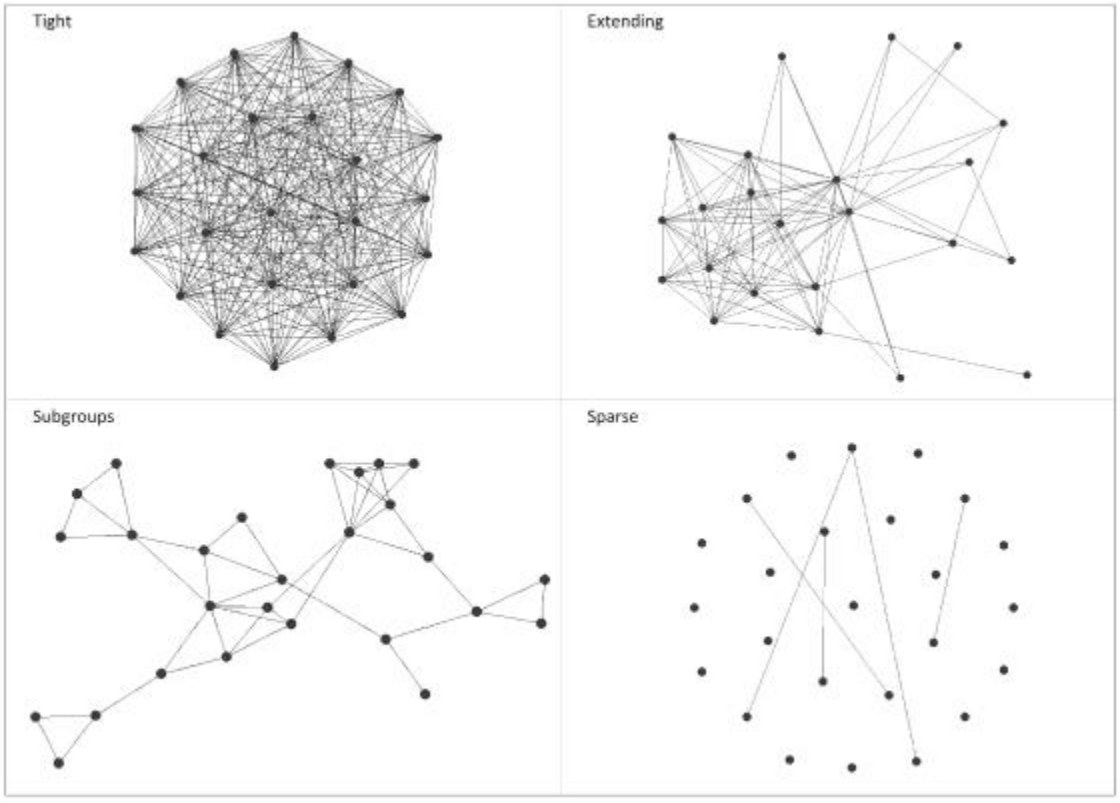

Figure 1. Ideal types of social networks

The reasons we did not use standard network measures using algorithms are twofold: (1) personal network analysis software does not capture all of these measures as we have

conceptualized them, and using standard network analysis software to analyze more than four hundred personal networks would have been costly in time and money—we are exploring batch-processing capability for future analyses of these networks using a combination of standard measures—and (2) our sense of each of these four ideal types is that formal measures of them would indeed include multiple measures to fashion each one, including adhesion, cohesion, density, components, and isolates; again, these are not all available through personal network analysis software.

Results

Levels of material and labor exchange

Before focusing in on the differences between Ecuador and Mexico in terms of labor sharing and material support—and then drilling down to the role of social network structure—we explore some basic dichotomies and their potential influence both on levels of support and on working for others. Specifically, Table 3 provides a glimpse at differences for respondents who were resettled versus nonresettled respondents, Mexican versus Ecuadorian, rural versus urban, highly impacted versus less impacted, and male versus female. Our Ecuadorian sites exhibit higher levels of material support and labor sharing. At least for labor sharing, which is more common among agricultural populations, this difference is partly because the Ecuadorian sample is more rural than urban and the Mexican sample is more urban than rural. This distinction is also made clear by the higher levels for the rural versus urban respondents. The higher support provided by respondent males (egos) and males in any personal network (alters) is contrary to findings in other studies where women have generally been found to engage in more reciprocal exchange relations than men (Komter 1996; Lomnitz 1977; Stack 1973; Susser 1982; Yan 2005). Our interest in disaster recovery led us to find that the resettled and nonresettled populations are similar when joining the Mexico and Ecuador samples, and network members in high-impact sites provide more support to respondents than do personal network members in low-impact sites, which intuitively follows from greater need among respondents in the high-impact sites.

	% alters providing material support to ego	% alters receiving material support from ego	% alters inviting ego to work	% alters invited to work by ego
Resettlement				
Not resettled	26	32	22	19
Resettled	27	32	21	21
Country				
Mexico	20	25	15	15
Ecuador	33[a]	32	28[a]	23[a]
Population density				
Rural	31[a]	36[a]	29[a]	25[a]
Urban	24	29	17	16
Impact				
Low	23	28	22	21
High	29[a]	33	23	21
Sex				
Male	29	35[a]	27[a]	25[a]
Female	24	29	18	16

a Category mean is significantly higher than the mean of the comparison category ($p < .05$).

Table 3. Percentage giving and receiving support, by various categories

Generally, as shown in Tables 3 and 4, the number of times alters asked egos to work was higher than the number of times egos invited alters to work, although the three Mexican sites and Penipe Viejo showed fewer differences in inviting and being invited to work—typically in each other's fields. For the other Ecuadorian sites, this difference suggests either bias in perception or people generally naming others who have more wealth and who thus would be asking egos to work at higher rates than vice versa. In fact, the data suggest that respondents were generally

naming wealthier people rather than expressing some form of bias. Specifically, on average, 23 percent of respondents named one-third or more of their network as people with less wealth and resources; 73 percent of respondents named one-third or more of their network as people with similar levels of wealth and resources; and 56 percent named one-third or more of their personal network as people with higher levels of wealth and resources.

Site	Average % of alters providing material support to ego	Average % of alters receiving material support from ego	Average % of alters inviting ego to work	Average % of alters invited to work
San Pedro Benito Juarez	21	Not asked	26	24
Teziutlan	22	25	10	7
Penipe Viejo	27	28	17	17
Penipe Nuevo	31	29	29	24
Pusuca	**35**	**39**	**36**	**33**
Pillate	**37**	31	28	21
San Juan	**39**	**39**	29	22
Total	26	32	22	20

Note: Values are bolded when the average for a site is more than one-third of the ties.

Table 4. Percentage giving and receiving material support, by site

Comparing Ecuador and Mexico

Consistent with what we have found in previous studies, reported levels of given and received support are far below the levels one would expect from the reports in the literature where exchange and mutual assistance are seen as important factors in survival among those of modest means in Latin America (Lewis 1959; Lomnitz 1977). Comparing the two countries (Figure 2), we see that Mexico consistently demonstrates lower levels of both labor and material goods exchange (see also Morris 1991) as a percentage of specific dyadic relationships.

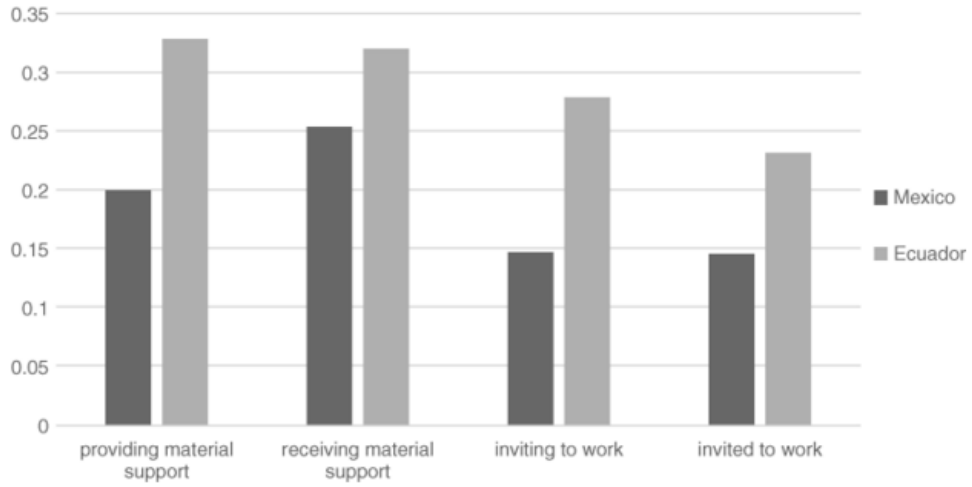

Figure 2. Overall levels of exchange in Ecuador and Mexico samples.

Next, we consider what is going on in each country based on the wealth levels of people sharing labor with others. Figure 3 presents a comparison of Ecuador and Mexico in terms of labor exchange between egos (respondents) and alters (people named by the respondent) by lowest, middle, and highest wealth quintiles.

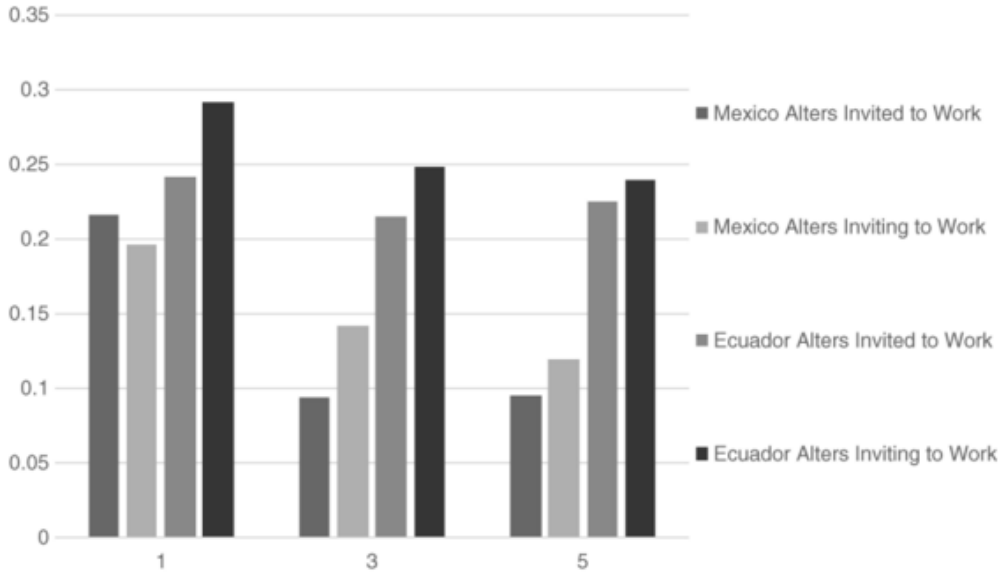

Figure 3. Percentage labor exchange in networks of respondents in the lowest, middle, and highest quintiles in Ecuador and Mexico.

These results show that, in Mexico, exchange is much greater among those in the first quintile (the poorest egos) than among individuals in the third or fifth quintile. There is a similar but less dramatic shift in Ecuador. The fact that exchange of work in the third and fifth quintiles in Mexico is lower than the others and much lower relative to Ecuador may reflect how Mexico is increasingly imbedded in a transnational agroindustrial economy (e.g., Chollett 2009) in which work exchange is not nearly as important for survival. In this population, class differentiations are increasingly being solidified, and elites or those of higher statues use the hired labor of others

to increase their position, although occasionally higher-status individuals allow others to work for them in exchange for other benefits in a relationship characterized by delayed reciprocity.

What is also noteworthy is the significant drop in labor exchange among individuals in the top quintile in Mexico when compared to Ecuador. One interpretation is that in Mexico, unlike Ecuador, increased material wealth is associated with stronger and tighter links to an industrializing global economy in which increased income and status are the result of paid work by individuals rather than the result of selling of commodities produced by those who own or control the means of production. For the case of labor reciprocity, this means that wealthier individuals in the more industrialized economy might be more likely to hire labor from people who are not their friends, family, or acquaintances and with whom they do not expect a reciprocal relationship—whether that relationship would be equal or unequal. A complementary corollary to such a thesis is that poorer individuals in the industrialized economy can choose employers who do not place them into unequal reciprocal relationships.
Exchange with farmers similar to exchange with general sample

Comparing all five quintiles, we see that the lowest quintile in Mexico receives the most material support and works for others more than do other quintiles (Figure 4). In Ecuador, it is the second lowest quintile that receives the most and works the most for those in their network. In fact, for absolute wealth, the lowest quintile of Mexico is closer to the second lowest quintile of Ecuador than it is to the lowest quintile of Ecuador (see Table 2). The implication is that the poorest of the poor (in Ecuador) have a harder time participating in exchange and reciprocity, even though their need is the absolute greatest.

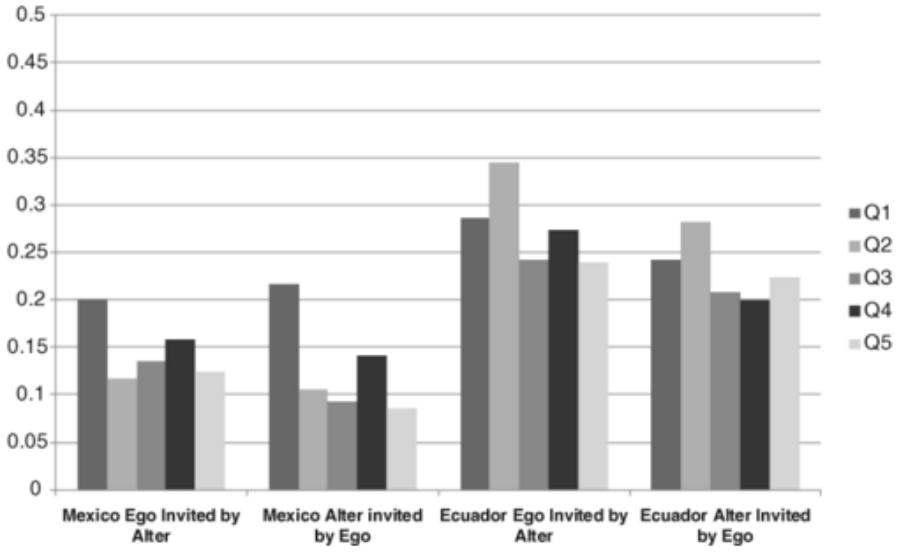

Figure 4. Ego absolute wealth in Ecuador and Mexico, by percentage of all respondents and their network members participating in labor exchange.

Figure 5 shows the labor exchange just for farmers rather than for the full sample. The quintiles behave similarly as for the overall samples. The pattern suggests a degree of reporting bias, at least in Ecuador, where respondents say they are inviting people in their network to work more

often than being invited, regardless of their respective wealth quintiles. Alternatively, it could be that relative wealth is what is important rather than absolute wealth; to look more closely at this, we soon turn to relative wealth after first examining labor exchange and absolute wealth.

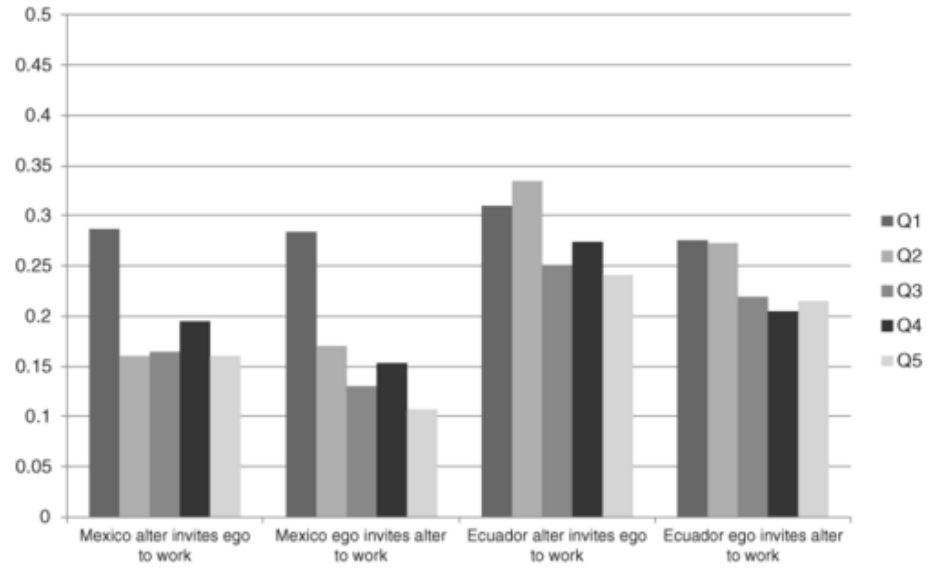

Figure 5. Ego absolute wealth in Ecuador and Mexico, by percentage of only farming respondents and their network members participating in labor exchange.

Figures 6 and 7 present an examination of the material exchange in both countries for each of the five quintiles. Once again, the clear pattern is that the second quintile in Ecuador is giving and receiving the most material support. Unfortunately, because we did not collect data on egos providing material support to alters until the end of data collection for the Mexican sample, we cannot report data for Mexico on egos providing material support. Figure 6 presents only people who farm for a living (which is the larger part of our sample in Ecuador), but it is clear that not much difference occurs between the two samples, except that in Mexico, the top quintile of respondents joins the lowest quintile of respondents as receiving relatively high levels of material support.

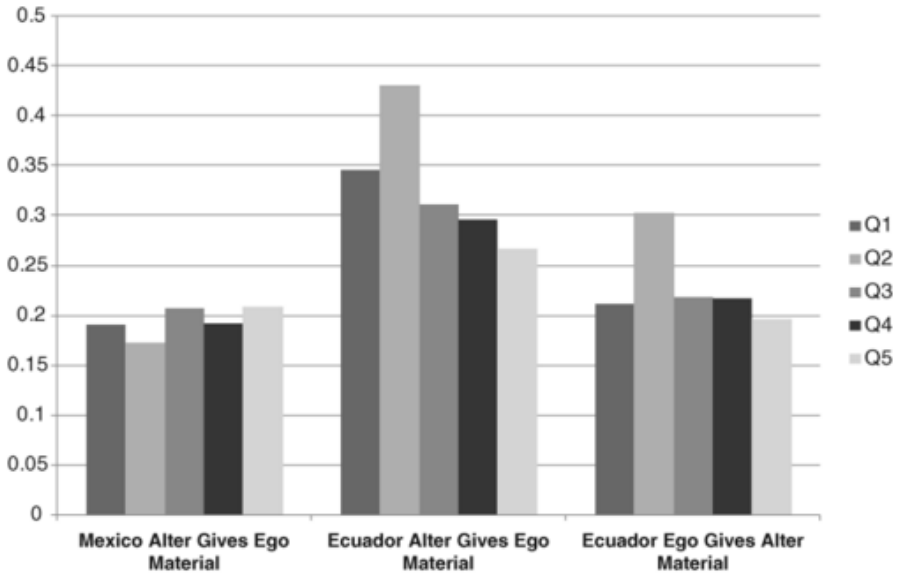

Figure 6. Absolute wealth of all respondents in Ecuador and Mexico, by average percentage of relationships that involve material exchange between respondents and people they named.

The overall sample in Figure 6 and the farmer sample in Figure 7 show few differences. Similar to Figure 6, we see in Figure 7 a possible bias in responding to our questions in that egos report receiving more material support than giving it, regardless of absolute wealth quintile. Importantly, in Figure 7, the Mexican wealthiest quintile of farmers receive higher levels of material support than do the other Mexican quintiles, plus higher material support than do Ecuadorians in the highest quintile, and also higher support than Ecuadorians who receive support from people in the highest quintile. In Ecuador, the pattern seems to be that the lower quintiles report higher levels of receiving material support. Besides overall lower levels in Mexico in Figure 7 than Figure 6, this is one of the more noticeable differences between Figures 6 and 7: that wealthier farmers in Mexico are finding ways to benefit the most in material exchange relationships. However, because the questions only ask about support and not the amount of support, it may be difficult to draw conclusions; we do not know the magnitude of support for each dyad, only the presence or absence of each kind of support exchanged between ego and each alter.

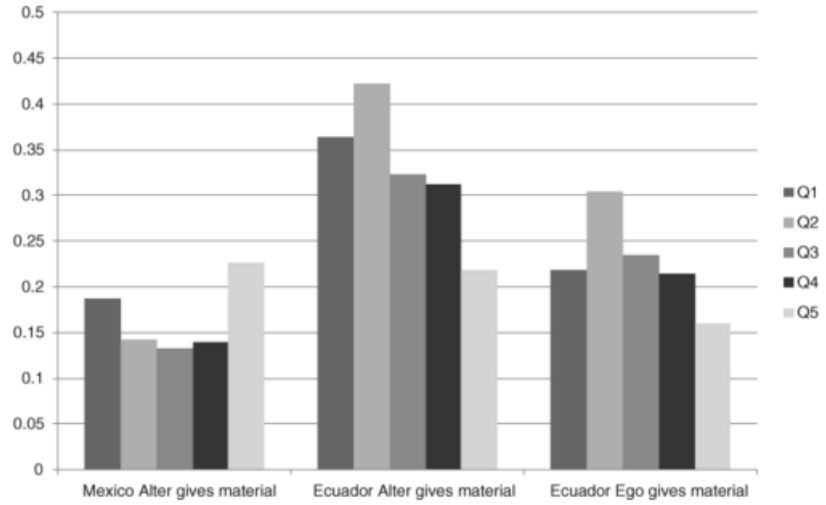

Figure 7. Absolute wealth of only farming respondents in Ecuador and Mexico, by average percentage of relationships that involve material exchange between respondents and people they named.

Perceived relative wealth and exchange

Now, turning to the role of relative wealth, where the respondent noted whether each network member had fewer, similar, or more resources than they do, Figure 8 shows that respondents say that they are giving the people in their network more material support than they are receiving when those people have fewer resources than they do. Similarly, people report receiving more when the people in their network have more resources. When people have the same resources, they report similar levels of receiving and giving. The same pattern holds for labor exchange.

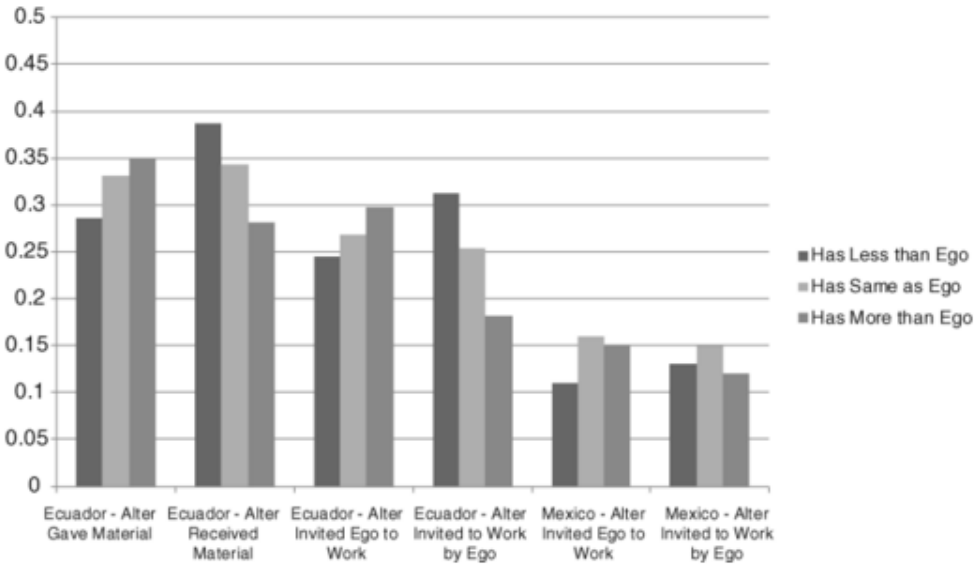

Figure 8. Dyadic material support and labor exchange in Ecuador and Mexico, by relative wealth of those in the respondents' personal networks.

In general, Figure 8 suggests that in Ecuador, exchange is where wealthier individuals are giving more than they are getting in terms of material support. However, in terms of labor exchange, they hire poorer individuals more than vice versa. In Mexico, we did not have data on egos giving material support to alters, but the labor exchange appears to be much less patterned than is the case for Ecuador. Based on these descriptive data, we note the possibility that a preference for exchange with those of a similar class may exist in the Mexican sample, suggesting the emergence of class-based relationships and networks.

Network types and socioeconomic status

To understand how networks may or may not aid households and individuals, we examined network types of those individuals in the first quintile. Figure 9 shows that, in both countries, nearly a majority of households in the first or lowest quintile live in tight networks.

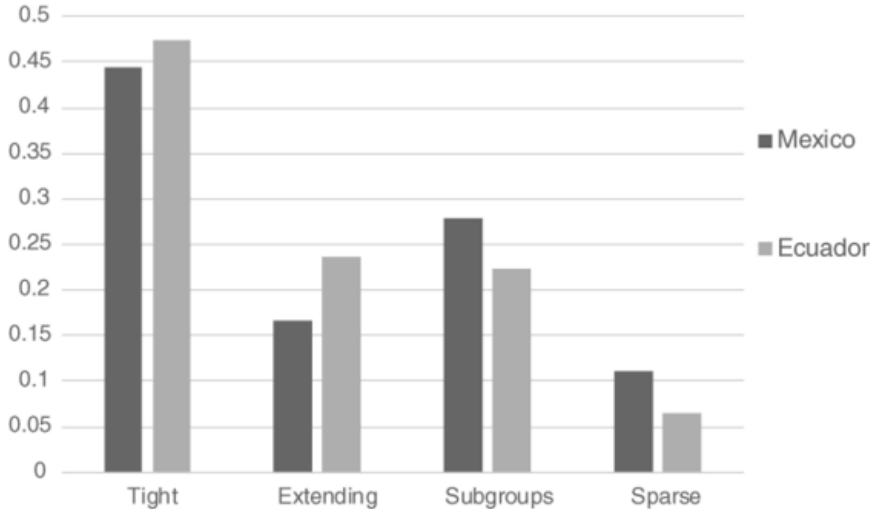

Figure 9. Lowest quintile distribution of network type, by country.

These networks closely correspond to Wolf's (1955, 1957) closed corporate community structure, where communities, individuals, and households look inward among themselves for support and advancement. What happens in the context of an extreme disaster affecting an entire small community is that such individuals have access to few resources, because all contacts in a small spatial proximity are similarly impacted, and when they do try to break out, they are often held back by others in their group or community.

Individuals in the top quintile are less likely to rely on tight, closed networks than are those in the lowest quintile (Figure 10). In Mexico, the most significant change, however, is in the population that is relying on extending networks (from 15 percent up to 25 percent of total relationships). Among this group, the extending seems to be toward individuals who live outside of the study villages and thus either in Puebla, Mexico City, or the United States. What is interesting is that most respondents (egos) in this group indicate that members of the extending network exchange a variety of goods and resources. In Ecuador, the shift from the lowest quintile to the highest quintile is one toward networks with subgroups. Wealthier individuals often use a strategy of connecting different subnetworks or at least having a relatively diverse set of relationships.

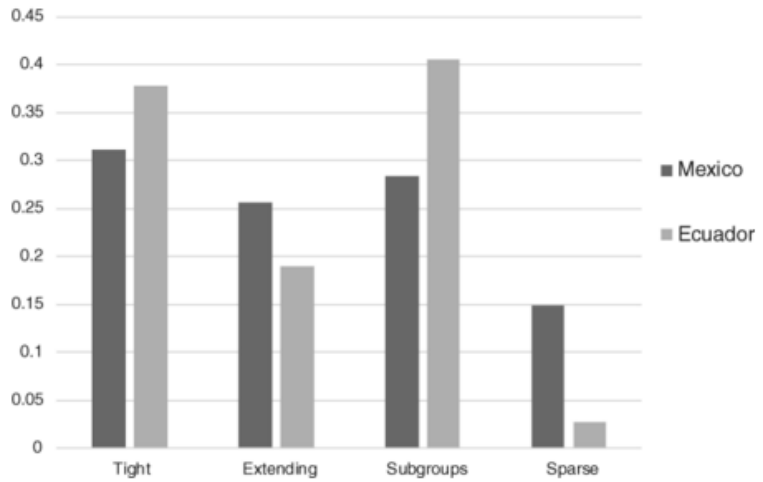

Figure 10. Highest quintile distribution of network type, by country.

Network type and exchange

To complete the triangle of relationships between networks, wealth, and exchange, we show in Table 5 how exchange varies by network type. Specifically, labor exchange is most common in the tight networks in both countries. Our expectation was that subgroup cohesion in a personal network would be positively associated with well-being, since it would not be so dense as to be suffocating, not so sparse as to not be a reliable source of social support, and not entirely dependent upon key brokers that held network subgroups together. Subgroups typically produce lower levels of exchange in Mexico than do tight networks, particularly for farmers. The difference between all respondents in Mexico and just farmers in Mexico is notable, with farmers exchanging labor with people in their networks more often than nonfarmers—the exception is that sparse networks of farmers exchanged less labor than did sparse networks in the overall Mexico sample. In terms of receiving material support, it is a mixed bag: subgroup networks did not produce high levels of support by alters of farmers, plus only sparse networks were different from the other network types regarding level of material support given by alters in the overall sample.

Primary type of network	Average % alters providing material support in ego network	Average % alters inviting ego to work	Average % alters invited to work by ego
Tight	**22** / 21	**18** / 28	**19** / 28
Extending	**19** / **26**	14 / 20	11 / 17
Subgroups	**21** / 12	11 / 16	10 / 16
Sparse	14 / 22	**18** / 13	**19** / 6
Overall average	20 / 17	15 / 22	15 / 21

Note : The first number in each pair is the overall sample, and the second number is from farmer subsamples. Network types with highest exchange values for overall and farmer samples for each type of exchange are bolded for each column.

Table 5. Network type by labor and material exchange in Mexico

In Ecuador, the critical network relationship for exchange really seems to be density—the more dense the personal network, the more likely the ego is to hire and be hired by fellow network members and receive material support, whether farmers or not (see Table 6). Subgroup networks perform poorly for labor exchange and moderately well for material support.

Primary type of network	All/farmers			
	Average % of alters providing material support to ego	Average % of alters receiving material support from ego	Average % of alters inviting ego to work	Average % of alters invited to work
Tight	**37/37**	**37/37**	**34/34**	**30/29**
Extending	30/29	31/29	26/26	23/22
Subgroups	**30/34**	27/30	20/22	14/16
Sparse	27/27	23/21	**30/30**	**24/23**
Overall average	**33/34**	**32/33**	**28/29**	**23/24**

Note : Network types with highest exchange values for overall and farmer samples for each type of exchange are bolded for each column.

Table 6. Network type by labor and material exchange in Ecuador

Discussion

Studies of reciprocity have found that material resources tend to flow downward, whereas labor and loyalty flow from the bottom up (cf. Mintz and Wolf 1950; Yan 2005), despite—or perhaps enabled by—explicit ideologies of reciprocity as an egalitarian practice. Another trend is to find forms of social support reciprocity associated with poverty and marginality (Gonzalez de la Rocha 2001; Lomnitz 1977), with interhousehold exchanges explained as part of a suite of practices that are part of coping with the isolation and scarcity of poverty. Indeed, the lowest-wealth quintiles having tighter networks and greater levels of exchange in our study seem to support such research. Thus, our findings are generally consistent with these prior studies, with perhaps the exception of finding greater degrees of material support exchanges among the highest-wealth quintiles in our sample. However, it must be noted that the variation in wealth we encounter in our samples is far from representative of wealth variation within Mexico and Ecuador and is in fact far more compressed and tends toward the lower end of the national distributions, which could explain why we still find frequent material support exchanges in this quintile.

Otten (2015) discussed cogently the degree to which reciprocity is not just an exchange, as reciprocity is often characterized; nor is reciprocity always a long-term commitment but often becomes a moral responsibility to others. This moral commitment occasionally crosses class lines, such as Otten's example of when members of an extended family are engaged in reciprocal relations. However, along with Otten, we expect that it is typically difficult to maintain moral obligations when there are unequal relationships; these stronger reciprocal obligations may tend to be more concentrated in within-class relations. This can be seen in our finding that the overwhelming percentage of reciprocated relationships in labor sharing come from dyads within the same class.

To what extent are levels of reciprocity in these domains due to new things that are happening in these countries and around the world? For example, proletarianization, even in the smallest of villages, produces higher within-class interaction than occurs in even larger farm communities with relatively few laborers who only work as paid laborers (Jones 2003). In our study, density of one's personal network plays a strong role in predicting reciprocity. With changes in agriculture and rural consumer lifestyles, along with general economic instability in an ever-globalizing world, these dense networks might be split apart by strategies to access goods, information, or labor to support greater individualized interests potentially in conflict with family or community interests, as is addressed by Provis (2015).

Somewhat surprising is that we did not find significant variation in material support and labor exchange based on level of disaster impact and resettlement. The burgeoning literature on this topic suggests that support exchanges are vital to recovery from disasters and resettlement (Cernea 2000; Hurlbert et al. 2001; Jones et al. 2011; Kaniastry 2012; Norris et al. 2004; Whiteford and Tobin 2009; Whiteford et al. 2005). One possible explanation for the lack of association lies in the variety of sites and countries we lump together in this sample. Elsewhere, our analysis of social support networks in Penipe Nuevo and Penipe Viejo reveal interesting and clear differences between women and men in the higher-impact resettlement site but not in the low-impact site (Jones et al. 2014). Another possible explanation is temporal. As we noted in the

introduction, very little research has been conducted on this topic beyond the near-term of postdisaster and postresettlement recovery. Earlier studies of postdisaster social support have found a decrease in availability of support and weakened social networks after the initial outpouring of support in the disaster aftermath (Norris et al. 2004; Ritchie 2012). Since our studies took place a minimum of three years after the disaster events in each site and at least one year after resettlement, what we may be observing is a stabilization (or perhaps even a destabilization) of social support exchange patterns in our study sites. Additionally, the literature on disasters and resettlement is also rife with cases of latent conflict, weakened alliances, exploitation, opportunism, and resistance to social hierarchies. We have elsewhere reported evidence of this in our study sites (Faas 2012), where different local forms of reciprocity and cooperation were adapted to the environment of competition for scarce development resources between communities as well as between resettlers in the Pusuca resettlement.

Conclusion

This exploration of inequality and reciprocal exchange suggests that people with greater wealth (even among those with quite low absolute wealth) report giving more material support to poorer people in their networks than vice versa. In concert with the fact that these same less-wealthy recipients are hired by their wealthier network relationships, it is clear that a kind of material support is exchanged by the wealthy for the labor of the less wealthy. In other words, the less wealthy provide labor and the wealthy provide an opportunity to work for needed cash—rather than a simple labor market transaction, the expected consistency of responsibilities in the patron–client relationship really mean this is a relationship of reciprocity. This is very clearly the case in our agricultural Ecuador populations. However, the Mexican population is much less agricultural, and thus this pattern does not hold up as strongly; rather, it is when people are of the same wealth level that it appears that labor is exchanged. In the Mexican sample, thus, people still hire one another, but the relationship is more often among economic equals. This might be evidence of the beginning of class relations, where people of a similar class (in urban settings) band together and are not tied as strongly to a community through unequal reciprocal relations. Alternatively, cultural differences in the two countries may exist that influence the role of exchange and reciprocity. Further research on such differences will help establish which contextual aspects are prominent as well as when long-held traditions are as good an explanatory factor as any other.

Regarding the role of the structuring of social relations (types of personal networks), the tightest (i.e., most dense) networks produced the highest levels of exchange between the respondent and people in his or her personal network. We did not collect data on exchange between alters in a personal network, so we do not know about overall levels of exchange in such networks, but it does appear that the tighter personal networks provide more help and work to ego, and prod ego to offer more help and work to his or her network. This may largely be because of the domination of the bottom quintile in both countries by the tight networks (Figure 9), though a higher percentage of tight networks existed in our Ecuador sample than in our Mexico sample. The implication is that, as suggested by Lomnitz, their need is what produces higher exchange and expectations of reciprocity.

Finally, our interest in extreme contexts, such as disasters, did not turn up much. Greater need in more highly impacted sites was associated with higher levels of material support. One further investigation that is necessary is to differentiate between chronic and acute hazards in terms of their influence on exchange and reciprocity. Our samples include both chronic and acute hazards, but it is not easy to definitively differentiate chronic and acute hazards in our sample owing to the role of resettlement. Additionally, many analyses require parsing out country and context, and the sample sizes become too small.

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Notes

1. “Viejo” and “Nuevo” are terms applied by the researchers to describe the contiguous settlements of Penipe.
2. Shower, gas/electric heated shower water, wood-heated shower water, refrigerator, gas stove, washing machine, pedal sewing machine, electric sewing machine, coffee maker, blender, iron, bed, lounge chair, kitchen table, cassette deck, CD player, radio, television, bicycle, motorcycle, automobile, VCR/DVD, microwave, video game console, TV antenna (dish)/cable, computer.

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