



ARTICLE



<https://doi.org/10.1057/s41599-023-02152-5>

OPEN

Nourishing social solidarity in exchanging gifts: a study on social exchange in Shanghai communities during COVID-19 lockdown

Youjia Zhou¹ & Chen Dong¹  

During the COVID-19 lockdown in Shanghai, we found many social exchanges within communities. In this study, we focus on exploring the driving forces behind social exchanges and their impacts on the social solidarity of local communities. Twenty-eight residents of separate communities are interviewed, and grounded theory is applied to have the motivation for social exchanges coded and analyzed. We find that reciprocal and generalized exchanges, rather than negotiated exchanges, occur in most communities. Among these exchanges, the willingness to share is stimulated by the traditional cultural norms taking place in online social groups. Residents will be propelled to carry on exchanges through sentiments cultivated within and to develop the micro social order through interactions in the media space. Social exchanges bring social solidarity to communities and develop it into a noticeable form consisting of functional, emotional, and communal aspects.

¹School of Humanity, Shanghai University of Finance and Economics, Shanghai, PR China. ✉email: dong.chen@sufe.edu.cn

Introduction

In April 2022, Shanghai implemented a two-month lockdown to curb the COVID-19 pandemic recurrence. The harsh restrictions on social distancing severely impeded transportation and daily supply. Despite the officials' best efforts, food and necessities were in extremely short supply for some time. Social exchanges have pervaded Shanghai communities of varying sizes to meet these basic requirements. Social exchange is an interaction in which two or more actors engage in a material or spiritual exchange of value with one another (Lawler, 2001). An example is a post entitled "Exchanging 12 Cans of Cola for Groceries," in which a resident placed a box of cola in the lobby of his apartment in exchange for some groceries. Later, when people came to the lobby for COVID-19 tests at different times, some of them took away the cola and deliberately replaced it with their own items, such as milk, chili sauce, and vegetables. The cola box eventually became an "exchange office" and never went empty. This post quickly engulfed the internet and was liked more than 3 million times.

Despite a high level of living risk and unsupervised unilateral exchange, most people acted reciprocally in the "Cola for Everything" initiative. According to the description, people perceived these exchanges as a flow of gifts rather than trades. In this typical example of social exchange, the acts of generalized reciprocity, as suggested by some scholars, can generate greater social solidarity than other social exchanges (Harrell and Greenleaf, 2023; Kanitsar, 2019; Lawler, 2001; Molm et al. 2007). Although the precise construct of solidarity has been discussed by various scholars (Bianchi et al. 2018; Durkheim, 2014; Kolars, 2021), social solidarity, in this paper, is defined as the "integrative bonds that develop interpersonally, and between persons and the social units to which they belong" (Molm et al. 2007, pp. 207). Trust and mutual regard in solidarity are proven to be conducive to disaster recovery and resilience in a pandemic such as COVID-19 (Fuschillo and D'Antone, 2023; Horak and Vanhooren, 2023). However, how to form social solidarity in modern communities still needs further investigation.

Historically, social solidarity was based on clan and territory resemblances. But with the complex division of labor, the fusion of markets, and the growth of cities, modern society has transformed from mechanical solidarity to organic solidarity (Durkheim, 2014). By delegating the exchange process to intricate institutions, anonymous markets isolate traders from the exchange network and fail to build strong ties through these interactions (de Beer and Koster, 2009). The declined need for individuals to be in contact with and trust their neighbors is what Xiang (2021) called "the displacement of the nearby ('fujin' in Chinese)." Many interviewees described their communities as stranger-like neighborhoods before the pandemic. Nonetheless, the unexpected lockdown in Shanghai disrupted the division of labor in modern society, leading to immense potential for the formation of norms and social solidarity.

As we have observed, media has been central in facilitating solidarity nowadays, even ordinary digital news sharing can produce social solidarity among people (Goh et al. 2017). After the implementation of social distancing policies in Shanghai, community-based WeChat groups, one of the most popular social media apps in China, were first created by posting QR codes in public spaces or on the daily necessities shared by the local authorities. Afterward, some specific WeChat groups are formed voluntarily for residents with common inquiries, fostering both online information exchange and offline food sharing. Inside these diverse kinds of virtual communities, we have witnessed the rediscovery of the nearby perspective during various social exchanges.

This study aims to explore the conditions and mechanisms behind solidarity formed in a public health crisis and offer an original perspective on elaborating on the role played by social media. We use ground theory to excavate the reward and norm behind exchange behaviors in a structural way. The survey data were collected from 28 interviewees coming from different local communities in Shanghai. Compared with widely used experimental methods (Kerstetter et al. 2023; Liao et al. 2017; Wang et al. 2023), this research design will entail the exploration on residents' reactions to some external conditions in a special time and reveal the context in which bonds are altered during the exchanges. We conduct a qualitative exploratory investigation on the evolving process of social exchanges to obtain a dynamic depiction of social solidarities' formation. Social exchange theory (Lawler et al. 2008; Molm et al. 2007; Schaefer, 2009) is employed to clarify media's role in establishing and developing exchange structures in communities.

This study contributes to extant literature on social solidarity in the following aspects: (1) We unravel the social mechanisms of social media in promoting offline social exchanges, where media provides a short pass to alleviating uncertainty and anxiety and increasing trust in the nearby. It draws a different picture of solidarities' origin raised in (Stewart and Schultze, 2019), where the embodied emotion (Vachhani and Pullen, 2019) plays a vital role. (2) A general framework is proposed for elucidating social media's impact on various social exchanges, where acts with generalized reciprocity and economic purpose are both investigated. This study not only contributes to the debate on the relationship between economic condition and solidarity (Emerson, 1981; Bianchi et al. 2018; Lawler, 2001; Lawler et al. 2008; Molm et al. 2003, 2007, 2009) but also consolidates the findings of media's role in producing solidarity with certain unified goals (Liu and Wang, 2022; Stewart and Schultze, 2019). (3) The findings can provide some valuable insights into public health management and community development for future crises. Some practical implications can be used to devise efficient social and business systems to help communities become more livable and sustainable after the pandemic.

Theoretical background

Social solidarity in different social exchange structures. Modern technology has tremendously improved people's everyday lives by offering them convenient ways to living materials, but it also keeps alienating people from their local neighborhoods using online media. It has been demonstrated by current literature that the formation of interpersonal relationships and social exchange can enhance social solidarity within a community (Cheung, Ma 2011; Eschweiler et al. 2019; Horak and Vanhooren, 2023; Kerstetter et al. 2023). To be precise, social exchange can contribute to increasing individuals' willingness to initiate unilateral social exchanges, generating bilateral sentiments (Lawler, 2001; Lawler et al. 2008), ameliorating their assessments of in-group integrity, harmony, reciprocity (Eschweiler et al. 2019; Harrell and Greenleaf, 2023; Molm, 2010), and raising their prosocial intentions (Simpson and Willer, 2015; Simpson et al. 2017).

Social solidarity could arise from the exchange process and vary in different exchange structures. In this study, we focus our attention on the three most salient aspects of solidarity from exchanges: functional, emotional, and communal. First, social solidarity serves functional purposes. People share dependent relationships to have their living needs or functional attachments sufficed (Emerson, 1962; Fuschillo and D'Antone, 2023; Liu and Wang, 2022; Molm et al. 2013). Second, social solidarity is emotionally rewarding. The formation of social solidarity implies

interpersonal ties based on shared sentiments, ideals, and beliefs, such as bonds of trust, shared understanding, and affective regard (Goh et al. 2017; Stewart and Schultze, 2019; Yao et al. 2017). Finally, social solidarity is communally derived. When social solidarity is established, interactions between community members are no longer random but standardized as a social order agreed upon by other members of the community (Bianchi et al. 2018; Liao et al. 2018; Kanitsar, 2019; Kerstetter et al. 2023).

To study the construction process of social solidarity, social exchange theory explores different structures of social exchange rather than focusing on specific paths that could lead to individual benefits (Emerson, 1962). Lawler et al. (2008)'s affect theory extends Emerson's theory by classifying exchange network structures into four specific types. This model describes changes in the exchange structure when objective (non-separability) or subjective (shared responsibility) conditions are developed (Lawler et al. 2008). This study evaluates exchange behaviors in Shanghai communities using Lawler's framework and supplements it with the duplicability and transferability proposed by Schaefer (2009), because information and labor are also essential components of exchange behaviors in practice due to the scarcity of goods during the lockdown.

In this study, there are four types of exchange considered. Specifically, a negotiated exchange is a bilateral exchange in which participants actively negotiate the value of goods for their benefit. Commodity exchanges based on price agreements are the most common examples in modern society. Reciprocal exchange differs from negotiated exchange in that the reward for the exchange is not guaranteed. However, uncertain outcomes of reciprocal exchange decrease the salience of conflict and weaken people's perceptions of procedural fairness (Molm et al. 2006; Molm et al. 2003). If procedural fairness is unintentionally achieved, more positive sentiments, such as interpersonal trust, are evoked (Cook and Emerson, 1978; Molm et al. 2009). We found that numerous reciprocal exchanges in our study were the derivation of some unilateral "gift-giving" at first. Generalized exchange refers to participation in exchanges on a broader scale than the previous two, often three or more people, where the actors of giving and receiving may not be the same. It is worth noting that the significance of generalized exchange for community solidarity has been consistently debated. Lawler (2001) argued that because the giving and receiving actions in generalized exchange are highly separated, the process is less likely to generate cooperation and shared responsibility. Other scholars hold a more positive view of generalized exchange outcomes, suggesting that it can produce affective rewards and develop trust among strangers (Molm et al. 2007; Willer et al. 2012). Scholars have also provided explanations for these theoretical differences. Lawler et al. (2008) raised some potential structural pushes to social solidarity during generalized exchange, including group identity, the norm of generalized reciprocity, cultural beliefs, and the opportunity costs of giving behavior. Some of these hypotheses have been verified in subsequent studies, such as shared social identity (Whitham, 2017) and strong norms of generalized reciprocity (Whitham, 2021). Productive exchange usually involves collective actions in production, which individuals can hardly accomplish alone. Productive exchange can result in and enhance social solidarity, which is the least controversial conclusion because the inseparability of members' contributions and shared responsibility is significantly higher than non-exchangers (Lawler, 2001; Whitham, 2021). Although this exchange structure is seemingly hard to happen without solid coordination, we find that during the pandemic lockdown, residents in some communities volunteered unanimously, actively engaged in food sharing, and helped the elders with their medical supplies.

The flow of reciprocity triggered by cultural mindsets: From online to offline. To study the social solidarity emerging throughout the social distancing period, it requires a focus on the initiative activities and their impacts on subsequent interactions. Social exchange is about how collective actors address the uncertainty of potential partners' values and the utility of different exchanges (Molm and Cook, 1995). While uncertainty in social exchanges usually arises from a lack of rules or organizing (Hoffmann and Glückler, 2022), the intention of sharing information with others can be dampened (Liao et al. 2017). Most social exchange studies have focused on the significance of forward-looking and viewed it as a given pattern, they are nonetheless inadequate in providing empirical evidence for specific mechanisms of contextual determinants, especially cultural contextual determinants (Spillman and Strand, 2013).

Cultural symbolic sets make actions premature by providing people with various action strategies, enabling actors not to deliberate on symbols' precise meanings (Swidler, 1986). Yan (1996) theorizes three aspects of decision-making when people engage in social exchange in traditional Chinese society: rational calculation, moral obligation, and emotional connection. This model is discovered through cultural symbols, such as "renqing" (a Chinese word for moral obligation) and "lishangwanglai" (a Chinese word for reciprocal rule of propriety) (Yan, 1996). These cultural symbols instruct people to give back when receiving a gift.

Although culture provides potential norms for action, its historical context may have changed during social development. Thus, the way people use culture for action changes within a specific context (Swidler, 1986; Lapinski and Rimal, 2005). The old Chinese social structure was highly intertwined with family ties (Huff and Kelley, 2003); nonetheless, Shanghai is a metropolitan area where social relations are gradually moving away from blood and regional ties. Technological advancements are also shrinking traditional acquaintance societies' disparate patterns, leading to the separation of "family" and "society" into two extremes: near and far (Xiang, 2021). Given these social changes, further research is needed to understand why inanimate traditional culture could act as a contextual determinant.

To analyze the retention of cultural impetus, this paper focuses on the media setting. The interaction between physical and virtual spaces calls for a re-evaluation of non-digital existence (Small, 2022). During the pandemic lockdown in Shanghai, interpersonal communication was limited within the WeChat group—virtual communities based in local neighborhoods. Even though the filter bubble created by the media leads modern citizens to "expression without communication" (Xiang, 2021), the media is demonstrated to possess the potential to promote prosocial behaviors as a woven sociocultural system (Hepp, 2020). Some scholars have shed light on the positive effects of media on exchanges. In virtual communities, sharing news and information contributes to maintaining social relationships (Goh et al. 2017), and sharing public risk information can reduce collective risk in communities (Liao et al. 2018). Information during the exchange process is referred to as resource variation (Schaefer, 2009). Due to the non-transferability and non-duplicability of physical goods, social solidarity in communities would be hindered by increasing exchange costs. Information, however, is a resource that is highly transferable and duplicable. In our study, we found that sentiments and micro social order derived from all kinds of social exchange can be easily spread or passively observed. As a result, social solidarity can be established from online spaces to offline communities. By this means, modern media has become a technical context in which the perspective of media can help residents rebuild a transparent social space and nearby social networks that rarely rely on existing social systems.

Methods

Data collection. Because the researchers were also under lockdown during the COVID-19 outbreak, this study combined participant observation with in-depth interview methods to collect interview data. Survey respondents were recruited by snowball sampling. They were asked for a reference from a member of a community other than their own with different backgrounds and experiences. The snowball sampling technique helps us reach more respondents living in different communities than expected. To guarantee sufficient variations among sample data, we intentionally choose communities with distinct locations, sizes, and pandemic severities. The data collection proceeded at the same time with the coding and analysis procedures, for example, we specifically raised the portion of elderly people during the interview, who are usually not familiar with the usages of mobile phone applications, but their population is big in Shanghai. In addition, to circumvent the issues originated from the non-randomness of the sample, such as the possible underlying network structure of information sharing, we control the friendship size, family size and the number of Wechat groups (i.e., social media skills) during the data collection.

According to preexisting literature (Lawler, 2001; Lawler et al. 2008; Molm et al. 2003, 2007, 2009; Schaefer, 2009), community size may possess a significant impact on exchange behaviors. We classified the surveyed neighborhoods into three categories according to their sizes (small for 500 or less than 500 households (43%), medium for 500 to 1,000 households (43%), and large for more than 1,000 households (14%)), no significant differences in exchange patterns are found among different exchange network sizes. For instance, negotiated exchanges are presumably to be less common in a larger community, as it is usually difficult to organize, turn out to be distributed quite evenly across communities of various sizes. Similar things happen to productive exchanges, we can observe joint purchases and voluntary service for Polymerase Chain Reaction (PCR) testing in every community with varied sizes and locations. A possible explanation is that large communities were divided into several subgroups in online chat, often as units or blocks. Additionally, because of the social distancing policy, residents rarely have the access to bigger neighborhoods. Each subgroup developed different exchange structures independently. This study also examined the severity of the pandemic, as well as the scarcity of materials in each community. Despite the possibility that different communities were confronted by unique pandemic situations, similar exchange structures discussed in the previous section appeared at varying stages of social distancing in Shanghai.

We therefore focus on demographic variables rather than community sizes during theoretical sampling. As a matter of fact, we noticed that during the pandemic lockdown, most online social exchanges were initiated by women; nevertheless, men have always been presumed to possess greater strength in offline communities. In addition, because most elderly residents are reported to be less capable of maneuvering the media than the younger generations, their roles in the social exchange structure are often silent bystanders passively accepting others' initiatives. Consequently, 28 interviewees were selected for this paper consisting of 23 females and 5 males in terms of gender. Their ages ranged from 17 to 86 years old, with 8 people aged 20 and below, 13 people aged 21 to 40, and 7 people aged 40 and above. Although most of our interviewees are younger people, the research findings still hold. During the interview, we found basically every respondent is living together with his/her children, parents, and even grandparents. Because of the social distancing policy, the decision to participate in an exchange can be regarded as a family decision. Additionally, youngsters can use mobile applications more proficiently than elder ones, thereby rendering

a detailed description on social exchanges. These factors contribute to our findings' resilience to the potential selection bias.

Coding and data analysis. This paper uses structural grounded theory (Corbin and Strauss, 1990) as a method of producing our theory and NVivo software to code. To protect the privacy of the respondents, all respondents in this paper were identified anonymously by number. We first coded data word by word during open coding, then classified data according to conditions, contexts, actions, interaction strategies, and consequences during the axial coding process. We compared the categories extracted from the sample and merged some similar categories (e.g., "politeness" and "return the favor"). In addition, several subcategories are removed for being haunted (e.g., "fun" when describing the motivation for exchange). In the end, five major categories were identified to explain people's motivation to engage in social exchange: moral obligation, rules of reciprocity, material reward, sentiment reward, and micro social order. Some of the major categories also included sub-categories under them; for example, the concepts of returning favor and expressing politeness both illustrated the guiding principles of cultural norms for reciprocity. They were grouped together under the category "rules of reciprocity".

Two methods were applied to test theoretical saturation after axial coding. Firstly, we used 23 samples for coding, and five random samples to examine whether novel categories would be generated. Secondly, the results were sent to three respondents after coding for feedback to ensure the respondents' exchange motivations were not misinterpreted. No new categories were found during the saturation test. In selective coding, exchange behaviors in communities were described using exchange rewards (categorized into individual rewards, such as material rewards and sentiment rewards) and social norms (including moral obligation, rules of reciprocity, and micro social order). Our complete coding scenario is depicted in Fig. 1.

A model of social exchange in the community under public health crises

To study the effects of social exchanges on social solidarity within the community that emerged during the Shanghai pandemic lockdown, this paper first attempts to categorize the forms of exchange using the theoretical construct in Lawler et al. (2008), and explores the evolution of exchange networks through the observation of exchange behaviors. The classification rules are: 1) the directness and scale of the exchange (e.g., negotiation and reciprocal exchange are usually direct exchanges between two people, while production exchange and generalized exchange usually require more actors to engage); 2) whether the exchange requires collaboration (e.g., reciprocal and generalized exchange usually require only the gift or return of goods according to actors' value criteria, while negotiation and production exchange require synchronic collaboration); and 3) the degree of inseparability between the exchanging behavior and the object being exchanged (e.g., in production exchange, the two are highly inseparable, as exemplified by volunteering works). To further understand the dynamics in different exchange structures, this paper also focuses on the emergent distribution rules and the types of items being exchanged (Schaefer, 2009), in which the distribution rules (including participants' behavioral rationality, altruistic intentions, self-interest, and so on so forth.) reflect the participants' sentiments toward communities at various stages of exchange; and the material characteristics of the exchanged items (e.g., whether they are transferable and duplicable) would

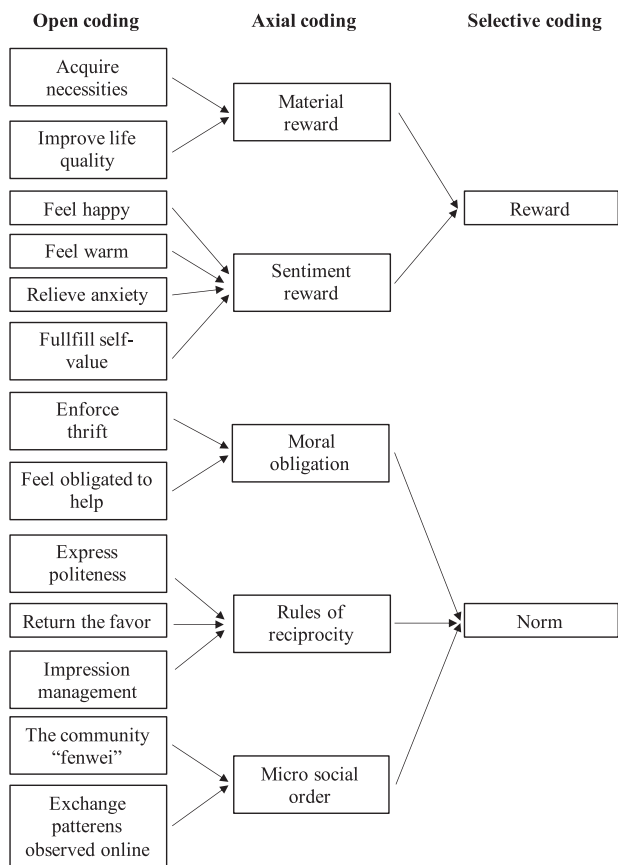


Fig. 1 Coding scheme. The coding structure used in ground theory; this structure has been verified by a saturation test.

influence people’s willingness to exchange due to variations in their evaluation of the exchanged value and are thus being considered.

By interviewing about the frequency and specific details of different forms of exchange structure, we identify the transformation of social solidarity from the functional, emotional, and communal aspects, as we concluded. According to the 28 interviewees, multiple exchange structures tend to co-exist in communities. The most frequent structures of these exchanges are reciprocal exchange (86%) and generalized exchange (50%). Twelve people (43%) mentioned that negotiated exchanges occurred in their communities.

Negotiated exchanges typically take two forms. Exchanging money for goods is the most common form of negotiated exchange in communities with a high division of labor. “If my item is valued high, I check Taobao for the price to sell.” (011) However, the mediating function of money partially collapsed during the lockdown; as one interviewee said, “What people lack is not money, is supply.” (011) People had to develop their exchange systems. Then, another type of negotiated exchange emerged: the exchange of items. “If I need a can of beer today, then I might propose an offer by saying I have vegetables, eggs, or anything else at home. Do you need them? That way someone else might say ‘I’ll give you beer in exchange for something.’” (005)

Reciprocal exchanges are more common than negotiated exchanges in communities. Twenty-four interviewees (86%) mentioned that they had participated in reciprocal exchanges and claimed that they did not have clear expectations of the returned value of the exchange. For example, “If it isn’t worth much, then probably I will just send it for free as a gift” (011) or “I would not hesitate to participate in helping if I could solve someone else’s

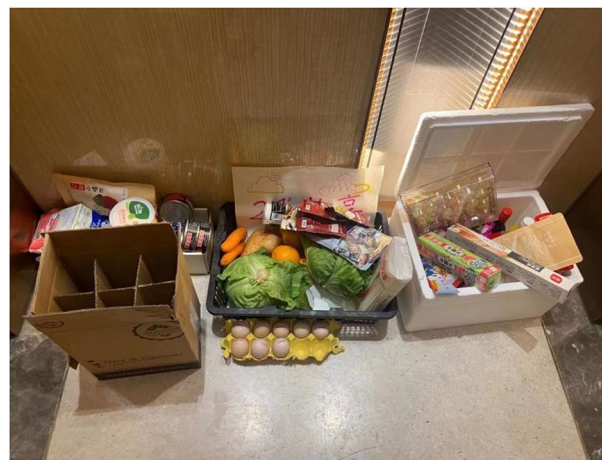


Fig. 2 Free pickup area in an elevator. The exchange areas are in various forms in different communities, for instance, some residents use the elevator to exchange foods with their upstairs and downstairs neighbors, by simply placing extra food in the elevator and take any kind they need. This figure is covered by the Creative Commons Attribution 4.0 International License. Reproduced with permission of our anonymous respondents.

problem” (013). These reciprocal exchanges are the beginning of a move away from modern commercial relationships to an interpretation of exchange as a “gift.” Lawler (2001) argues that actors of reciprocal exchanges are less inseparable from the tasks they undertake. In our observations, however, reciprocal exchanges are often accompanied by delayed reciprocity.

In addition to direct “gift” reciprocity, 14 (50%) respondents also mentioned generalized exchanges. While “gifts” circulated on a broader scale, generalized exchanges were often not transparent to participants. The entire exchange process occurred through physical intermediaries, such as barter closets and doorman offices. Even though residents did not know who was taking the goods they provided or from whom they were taking the goods, they were all willing to contribute their supplies to this non-transparent intermediary. “The stuffs were basically full of the rack, and there’s even been more stuff after the pandemic becoming less severe” (001).

Productive exchange is the most special type of exchange during lockdown. One type of productive exchange is that some actors received raw materials from others, used these ingredients to cook food, and put the cooked food in the elevator for neighbors to pick up (refer to Fig. 2 and Fig. 3). Another type of productive exchange is that the “head” (the organizer of the group purchase) purchased goods of a whole block and other residents were responsible for distributing the goods. This collaboration was indispensable because the manufacturers distributed goods only on a community level rather than an individual level during the pandemic lockdown. In addition, productive exchanges also occurred in the form of information exchange, such as the allocated tasks of purchasing goods on e-commerce platforms and sharing them after successful procurement. More broadly, productive exchange took the form of collective contributions, such as participation in community volunteering, which was popular in nearly every community.

“I think people will give back to those who are more actively involved and give more in exchange. One kind of feedback is verbal feedback, which costs nothing, and contributors will be thanked inside the group. The second kind of feedback is material feedback. For example, if the ‘head’ is short of onions, he can say it inside the group, and



Fig. 3 Sharing cooked food using others' ingredients. Some residents use the food ingredients in the exchange area to cook dumplings and cupcakes. This helped those who can't cook have access to a nice meal, a productive exchange then surfaced. This figure is covered by the Creative Commons Attribution 4.0 International License. Reproduced with permission of our anonymous respondents.

then people will say you could come and get it from me for free." (011)

Additionally, as interactions became frequent, the type of exchange shifted from a bilateral exchange, such as a negotiated and reciprocal exchange, to a unilateral exchange. Social exchange structures evolved from money-mediated negotiated exchanges to reciprocal and generalized exchanges, with a much higher likelihood of non-reciprocal risk, and signs of productive exchange of goods, such as joint events or food sharing, also emerged. This process reflected a reduction in the residents' perceptions of non-reciprocal risks and increased trust in the exchange process.

An increasing number of unilateral and indirect exchanges occurred during the middle and late stages of the pandemic lockdown, indicating social solidarity was being built. The frequent productive exchanges at a later stage implied the communal aspect of social solidarity. No massive commercial credit system supported the exchange process; instead, it was based on social ties built from proximity, referred to as the nearby. Neither the physical nor the online virtual neighborhood existed in the community before the lockdown. As a means of extending autonomy and sociality outward, residents used social media to create the online nearby during the early phases of the lockdown. The construction of the nearby can be seen in people's choices between the convenience afforded by the media and real social ties.

"People would usually tell us what item they took through the WeChat group. I had a group for supplies and made a table where you could note whether your needs had been solved. But people preferred to communicate directly through the WeChat group." (016)

With the change in exchange patterns toward unilateral and indirect communications, the reconstruction of the nearby in the physical realm was facilitated by the online nearby. Figure 4 illustrates the transformation of the exchange patterns and the nearby.

Reshaping social solidarity in social exchange

Cultural norms: Driving sustainable social exchange. Although the fairness of negotiated exchange could reduce the uncertainty of lockdown and people's perceptions of risk, most people lacked sufficient goods to exchange as a result of the sudden lockdown. The paper suggests that culturally constructed acting strategies that initially undermine perceptions of equivalence and risk might explain non-direct exchange behavior.

Culture serves as a strategy for people to act. They can be even more durable than specific goals (Swidler, 1986). Culturally constructed strategies were first applied to social exchange initiators. A sense of moral obligation was fundamental to Chinese culture, which limited residents' perceptions of exchange benefits. Even if it entails a unilateral personal cost, moral obligation drives people to be socially responsible. As a result of the cultural instruction that actors received as children, such moral concepts were shaped over time by the redundancy of cultural knowledge that was not normally utilized (Swidler, 1986), resulting in the initiation of the exchange chain.

"I was really grateful when the kids of the old couple bought me some toast to thank me... However, I didn't even think about rewards (when I helped the old couple) ... Also, I helped the old couple not because I wanted to be thanked. I won't be really touched if people just say thank you to me. It was more like I felt like I had to do something (to help those in need). It was an obligation." (016)

Furthermore, culturally shaped norms stipulate more specific strategies for returning gifts than just an obligation of reciprocity. Individuals were more willing to return extra gifts when relationship symbols, such as "renqing" and "mianzi" (a Chinese word for dignity), were in place. According to respondents, adhering to social norms is referred to as "zijue" (a Chinese word for self-consciousness). Even if the exchange initiator does not expect a comparable or additional reward, a sense of shame arises when the recipient violates the interaction strategy imposed by cultural norms. Occasionally, the additional reward was intended to positively affect the impression management of the individual. This reflects the relation-orientated traditional Chinese society. "If I didn't pay back enough, I'd look stingy. I think exchanging is based on 'renqing', that is, you don't want to tarnish your image... Because of these reasons, the unequal value of the exchange could be ignored" (011).

Cultural norms spark the initiation of indirect exchange, fueling reciprocal exchange and generalized exchange within communities. Cultural norms also determine principles such as the obligation to return and to return additional value. As a result of practicing cultural norms, the risk of non-reciprocity is eliminated, and communities are prompted to develop relatively stable and functional social solidarity. This is to support one another through the circulation of gifts in a time of material shortages.

Sentiments: A catalyst for social solidarity. Cultural norms drive the formation of functional social solidarity and individuals' sentiments reinforce their willingness to follow and re-practice such norms. Sentiment is a sign of the internal state of people, which is based on a symbolic system commonly accepted by the

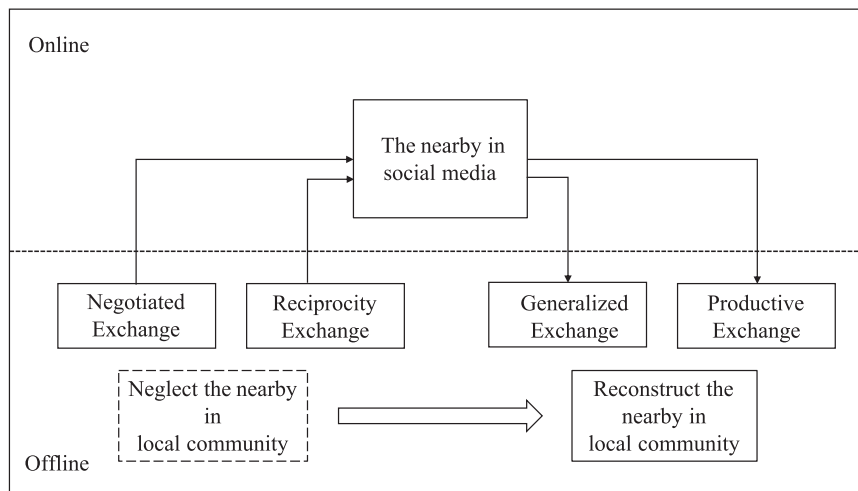


Fig. 4 Social media's mediation role in exchange evolvement. Social media helps residents develop some complex forms of social exchange based on primitive exchanges such as negotiated and reciprocity exchanges. Almost every exchange was “witnessed” by other neighbors online, the risk was reduced, and the kindness was magnified. Step by step, residents started to build strong connections with the neighborhoods, i.e., the nearby.

community (Homans, 1961). For example, returning a gift is often perceived as gratitude. Increased social exchanges resulted in the development of sentiments in many communities. The emergence of productive exchanges further suggested a high level of sentiments and shared responsibility (Lawler, 2001), and they were transmitted within the community as a result of various social exchanges that took place.

While some community members replied that they reciprocated just because they were “*afraid of receiving something, for fear that I would not be able to repay the ‘renqing’ later*” (019), as long as they followed the cultural norm of reciprocity, their contribution could inspire positive sentiment, among others.

“I didn’t exchange anything on purpose, just someone gave me something, and then I gave him something back, like returning a ‘renqing’... But I did receive a lot of gifts, such as an egg tart from a neighbor today, fresh watermelon juice from another neighbor yesterday, noodles yesterday, then a cake, flowers, and many gifts.... The act of receiving things is quite enjoyable, and you will find that many people are silently caring for you.” (019)

By using digital media, the positive effects of these sentiments are amplified exponentially. Particularly in indirect exchanges, social media plays a vital role in generating and disseminating sentiments. As a result, bystanders can perceive emotional symbols in social exchanges distributed through media platforms, such as WeChat groups. It is critical to note that traditional indirect exchanges do not evoke strong sentiments because the actors are invisible (Lawler, 2001). However, due to media intervention, the act of exchange became observable. It was found in the interview that in indirect exchanges without social media intervention, people focused primarily on the equivalence of the items, and the sentiment was more related to functional satisfaction; for example, “*I was glad to receive the food I wanted to eat.*” (002) Rather, positive sentiments in an exchange with media intervention were often attributed to social relationships, such as gratitude for the group and a sense of belonging. For instance, “*My fulfillment doesn’t come from the exchange action, but from other people’s responses.*” (011)

By exchanging sentiments and establishing communal bonds, community members would be more likely to receive both material and emotional rewards, including “a good relationship

with your neighbors would bring more practical help, anxiety relief, and social support” (005). Having sentiments in place gave people more assurance that the exchange would be fair and could reduce their concerns about non-reciprocity (Molm et al. 2007). It is imperative to note that as people experienced overwhelming loneliness, anxiety, and other negative emotions during the lockdown, sentiments became an invaluable reward.

“During the lockdown for half a month, you must go and communicate with your neighbors. As time goes by when you are communicating with your neighbors, you feel like the day passes so quickly that you do not think time flows slowly anymore.” (022)

Micro social order: Norms diffused in media space. Group sentiments stimulated social solidarity and encouraged individuals to express sentiments repeatedly by practicing risky unilateral exchanges. Following a sense of network cohesion and positive sentiment toward the group implied by the term micro social order, the number of negotiated exchanges declined, and the number of indirect exchanges increased. In this study, it was found that social media played a crucial role in transforming community-level exchange patterns and generating a micro social order.

In contrast to offline face-to-face exchanges, social media diversified the objects exchanged. Information, as a special exchange in the media, was reusable and had a high marginal benefit, thereby reducing the cost of generalized information exchange while increasing the frequency of initiating generalized exchanges. “*In spite of the fact that the elderly sometimes don’t reply to messages and don’t chat with us, they actually look at them very carefully.*” (019) As a result, individuals can reduce both individual and community risks through message sharing (Liao et al. 2018). For example, “*I think this is very much like the shape of primitive society, the risk between being in a tribe versus hunting alone was very different.*” (011)

The retention of online group chats facilitated material exchanges by enabling each member to observe the actual items and behavioral contributions of others (ref. Fig. 5). Observers would “*get to know the active members of the group*” and even “*go (to the group) to observe*” (027) before they intended to change and then give more weight to “*the more active actors who*

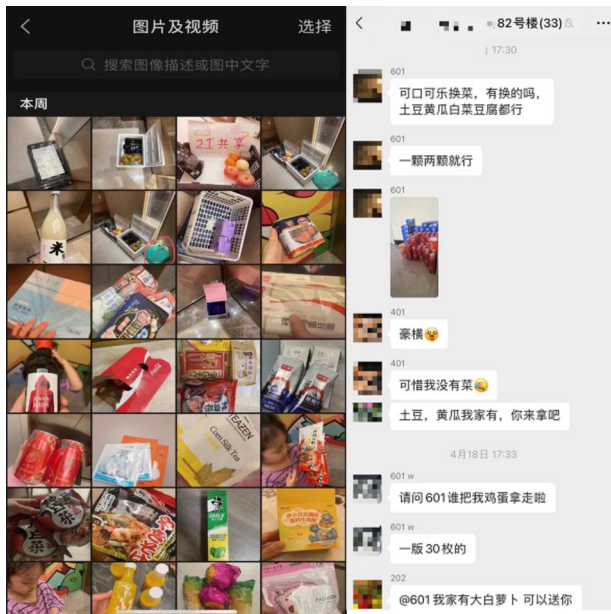


Fig. 5 Using WeChat groups to share information and exchange foods.

People use Wechat groups to keep updates on the elevator exchange. We can tell from the left screen shot that there were plentiful kinds of goods being exchanged. The residents have become accustomed to proposing a food exchange via online social media at any time. In the right panel, we can see a proposal (in Chinese) on cola for vegetables, cucumbers, or tomatoes, it was responded instantly. This figure is covered by the Creative Commons Attribution 4.0 International License. Reproduced with permission of our anonymous respondents.

participated in more voluntary activities.” (027) A “thank you” was often the end of an exchange when two people communicated offline. *“The experience of receiving a thank you is without much of a sense of touch.”* (006) In contrast, contributions were recognized through online symbolic interactions on a broader scale. Active actors tended to receive significant material rewards for their volunteer efforts. As a result, symbolic interactions in the media reinforced the micro social order.

The media’s involvement in the interaction process transformed individuals’ unrewarded contributions into an underlying norm shared by other group members. Consequently, people were encouraged to participate continually in social exchanges to consolidate the collective benefits of the community. Every individual’s contribution was recorded in the chat group and was magnified during the exchange process, thus reducing residents’ anxieties about unforeseeable risks, which were especially important during a time of health crisis. A conducive micro social order was therefore crucial in encouraging community members to engage in social exchanges for various needs.

“At first, I thought if we kept promoting such a free giveaway, some people who are able to help would not act willingly. Providing supplies is already a kind of help, why send it for free? However, because everyone was so generous, I felt a little self-doubt. For example, when they began to purchase bread collectively, I asked if I could buy just a little bit. The head of the group didn’t charge me anything, so I thought, oh, I shouldn’t haggle over every ounce”. (011)

Finally, cultural norms that shape unilateral and indirect exchanges are practiced, reproduced, and diffused in the media space. Whenever a micro social order is established, individuals

would no longer choose social norms from their unique cultural toolkits but instead, act accordingly to meet the social order depicted in the media. Furthermore, these exchange patterns can spread across geographical boundaries between neighborhoods and may be referenced by other community members through media spaces. In the example of “Exchanging 12 Cans of Cola for Groceries,” the generalized exchange inspired other communities to follow and mimic.

Once a new micro social order is established, it will modify the intra-pattern within the community in the long term, even when the severity of the pandemic has decreased: *“We are exchanging more and more often because we are getting to know each other better and better.”* (017) Community residents used pre-existing social networks to improve community autonomy or build new relationships with their neighbors. These phenomena demonstrated a profound impact on functional, emotional, and communal social solidarity. *“When the pandemic passes, residents will demand more autonomy, and we will have a platform for residents to communicate about parking spaces and renovations. We also made new friends.”* (026)

Conclusion and discussion

The rapid development of media technology and e-commerce has profoundly changed residents’ lifestyles in modern metropolises, such as Shanghai. The availability of rich information channels and convenient shopping experiences have significantly improved people’s quality of living. However, they reduce people’s need for interpersonal contact and inevitably create feelings of alienation among city residents. These modern cities have consequently been referred to as *“concrete forests”* (021) by some residents. This situation worsened during the pandemic lockdown as China’s government put much effort into enforcing social distancing to stop the spreading of COVID-19. In this study, we find that the use of social media, even during a special period, can contribute to rebuilding interpersonal ties in both the virtual and the physical nearby, people started to care and become engaged in communities’ affairs. Social solidarities within the communities then surfaced, regardless of the sudden disconnection among people. In the beginning, these social solidarities were developed by residents exchanging material goods for functional purposes. Over time, the emotional expressions attached to these goods provided residents with positive sentimental support and gradually stimulated a sense of belonging and responsibility to the neighborhood.

In this study, we use social exchange theory to learn and classify specific social exchange behaviors that took place in Shanghai communities. We find that although negotiated exchange could be more efficient in reducing exchange risk, reciprocal and generalized exchanges, which only have unpredictable rewards, were more prevalent in the investigation, nonetheless. The traditional cultural norms such as thrifty and helpfulness function as the key force behind the initialization of exchange. Social media has facilitated social exchanges and solidarity development by demolishing information gaps. As a generalized exchange form of reciprocity, sharing news on COVID-19 and local community can help residents develop an awareness of the nearby. Exchanges in the same community not only help residents through difficulties but also breed common sentiments in the community. Individuals who do not participate directly in the exchanges will learn and follow the same practices in the future, even if they do not directly participate. A micro social order is settled consequently. The establishment of a micro social order allows people to evade the risks associated with reciprocal and generalized exchanges in which rewards were previously hard to guarantee. As these two types of exchanges could evoke more

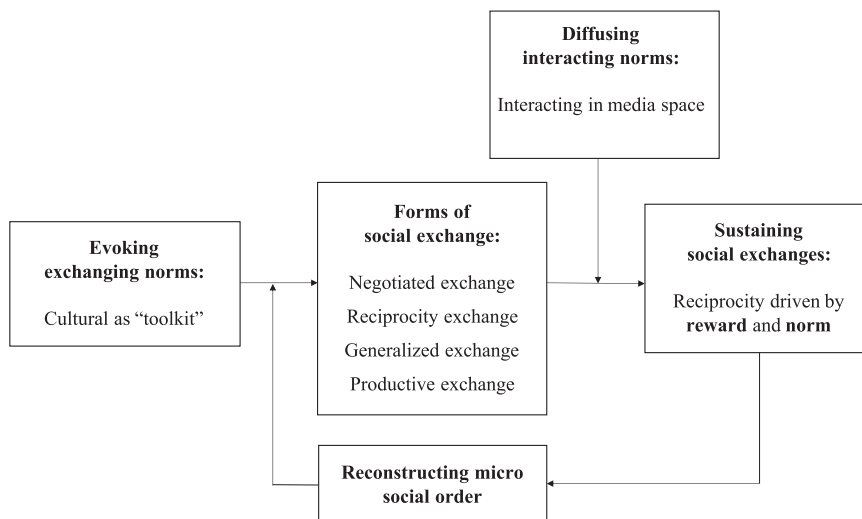


Fig. 6 Social exchange – social solidarity. The arrows illustrate the origins of social exchanges and the evolution of these exchanges from primitive to sophisticated forms. People can learn how to exchange in online media space and be propelled by the reciprocity within to exchange continually. Once the micro social order is established, the social solidarity can be further consolidated.

collective awareness among residents and provide positive feedback with some surprises, reciprocal and generalized exchanges contribute significantly to the formation of social solidarity. Figure 6 briefly illustrates this spiral development from social exchange to social solidarity.

Theoretical Implications. In addition to the findings above, this paper details some empirical data on existing controversial research findings. The findings of this paper validate the main conclusion of Molm et al. (2007) that people establish stable exchange norms from direct or indirect reciprocal exchanges and further derive emotional social solidarity. In contrast, Lawler et al. (2008) asserted that the jointness of tasks in exchange is the key factor in social solidarity, and less collaborative exchanges, such as reciprocal and generalized exchanges, contribute the least to social solidarity. According to our investigation, reciprocal and generalized exchanges contain more affective sentiments that can enhance people’s emotional rewards received in exchanges. With the help of social media, these emotional rewards have more chances of being exposed to others in a larger public space (media space), enabling others to empathize with, share, and learn from them. Unlike most online social groups formed by common interests, online groups based on proximity are not established to earn group members’ attention but to maintain well-organized relationships communally. Group members will also have common interests, and most of these interests are related to the community in which they live.

Aside from the above, Lawler et al. (2008) asserted that large size of exchange networks in generalized exchanges may be detrimental to the formation of stable interaction norms due to the uncertainty of rewards in unilateral exchanges, which may harm the perception of collective contributions by participants. However, we find that the extensive use of social media by residents significantly reduces the potential risks associated with larger exchange sizes. This is because every exchange-related norm becomes observable in media spaces and is faced with underlying inspections by other group members. In addition, concerns about the pandemic endowed residents with a mutual understanding of helping each other. As a result, residents are less concerned about exchange inequality due to strong norms and sentiments among exchanges. Our findings actually support the hypothesis that Lawler et al. (2008) stated in the Discussion

section. Lawler et al. (2008) assumed that some exogenous factors or structural change could facilitate the formation of the micro social order in generalized exchanges. In our study, these factors are people’s shared identification with the community, individual accountability and responsibility, and their common sense of generalized reciprocity.

Practical Implications. This study also provides some practical implications on public health management and community development. First, the prevalence of reciprocal and generalized exchanges in various communities reveals the fact that social solidarity is evolving from its initial functional characteristics to its emotional and communal characteristics as exchanges proceed, thereby significantly improving communities’ resilience to pandemic. These two kinds of exchanges can be most efficient in helping those people who are faced with food and necessity shortages, because of the resource asymmetry caused by sudden lockdown policy (Harrell and Greenleaf, 2023; Hoffmann and Glückler, 2022; Schaefer, 2009). To faster solidarities’ evolving process, external rewards, such as publicizing the prosocial deeds, and external punishment, such as public condemnation to deception (Kanitsar, 2019), can be imposed. It can help the residents motivated by the perceived sentiments in the exchange behaviors to shift from passive respondents to active practitioners.

Second, social media plays a crucial role in facilitating social exchanges in the nearby. It has moved beyond the function of a public chatting space but as the soil to breed micro social order. WeChat groups are often the icebreakers and help residents of the same community get acquainted with each other, even their next-door neighbors. They also serve as a window for people to have their needs heard, which is a strong sentiment that can bring out a sense of gratitude and belonging. A strong emotional and communal bond not only decreases a resident’s negative emotions during a lockdown but also reduces the uncertainty of being rewarded (Goh et al. 2017; Horak and Vanhooren, 2023), thereby ensuring the sustainability of social exchange during the lockdown, the emerged productive exchanges are evident proof. Online communities therefore should be consolidated as social infrastructures to encourage social solidarity to flow freely during the pandemic and post-pandemic.

Third, the introduction of social media has deeply changed the social exchange network structure. It brings numerous silent observers as third-party actors in the exchange network and generates a unilateral exchange of information. Consequently, “good” exchanges will propagate, whereas “bad” ones will be boycotted. To derive a precise depiction on social solidarities’ formation, current literature on social exchange theory needs to be updated by incorporating the account of the context of human interactions (Fuschillo and D’Antone, 2023; Kolers, 2021) and exchange network structure (Bianchi et al. 2018; Nie et al. 2022). These two aspects are also the most crucial factors requiring examination in a crisis.

Limitations and future work. Notably, there are still some limitations within this study to be addressed. First, this paper does not fully consider how differences in residents’ media use affect social solidarity formation. We notice that a substantial percentage of residents in every community remain unacquainted with modern media technologies, most of whom are elderly. This will inevitably cause the second limitation within this study. We have not fully accounted for the social network differences behind residents in participating in the social exchanges. Although these residents’ absence in the media space aroused others’ attention in our investigation, their comparatively weak capabilities in shaping the micro social order of exchange may have a detrimental impact on the long-term development of social solidarity. According to Molm et al. (2003, 2006), exchange participants with different authorities can lead to significant differences in the exchange patterns of negotiated and reciprocal exchange. During the pandemic lockdown, people who could use the media fluently participated in more exchanges than those who could not and had more authority in setting the exchange order. Therefore, sustaining social solidarity requires effectively managing the media space within a community.

Solely relying on community self-management is often inefficient and somewhat biased. In addition to this, solely relying on external administrative support may also fail because different communities may hold different requirements. Henceforth, how to maintain long-term social solidarity during a non-crisis period requires future research; nevertheless, some practical measures have already been taken. As we can see in some communities, residents spare some established public spaces to accommodate communal activities, and several manufacturers have established exclusive sources of supply to better serve the communities. As a result, the community now functions more cooperatively as a whole.

Data availability

The datasets generated during the current study are not publicly available due to the privacy protection of respondents but are available from the corresponding author upon reasonable request.

Received: 11 May 2023; Accepted: 8 September 2023;

Published online: 30 September 2023

References

Bianchi F, Casnici N, Squazzoni F (2018) Solidarity as a byproduct of professional collaboration: social support and trust in a coworking space. *Soc Netw* 54:61–72. <https://doi.org/10.1016/j.socnet.2017.12.002>

Cheung CK, Ma SK (2011) Coupling social solidarity and social harmony in Hong Kong. *Soc Indic Res* 103:145–167. <https://doi.org/10.1007/s11205-010-9702-8>

Cook KS, Emerson RM (1978) Power, equity and commitment in exchange networks. *Am Sociol Rev* 43(5):721–739. <https://doi.org/10.2307/2094546>

Corbin JM, Strauss A (1990) Grounded theory research: procedures, canons, and evaluative criteria. *Qual Sociol* 13(1):3–21. <https://doi.org/10.1007/BF00988593>

de Beer P, Koster F (2009) Sticking Together or Falling Apart? Solidarity in an Era of Individualization and Globalization. Amsterdam University Press, Amsterdam

Durkheim E (2014) *The Division of Labor in Society* (S. Lukes, Ed.). Free Press. (Original work published 1893)

Eschweiler J, Svensson S, Mocca E et al. (2019) The reciprocity dimension of solidarity: insights from three European countries. *Voluntas* 30:549–561. <https://doi.org/10.1007/s11266-018-0031-x>

Emerson RM (1962) Power-dependence relations. *Am Sociol Rev* 27(1):31–41. <https://doi.org/10.2307/2089716>

Emerson RM (1981) Social exchange theory. In: Rosenberg, M., Turner, R.H. (Eds.), *Social Psychology: Sociological Perspectives*. Basic Books, New York, NY, pp.30–65

Fuschillo G, D’Antone S (2023) Consumption networks in times of social distancing: Towards entrained solidarity. *Marketing Theor* 23(2):343–364. <https://doi.org/10.1177/14705931221137730>

Goh D, Ling R, Huang L, Liew D (2017) News sharing as reciprocal exchanges in social cohesion maintenance. *Inform Commun Soc* 22(8):1128–1144. <https://doi.org/10.1080/1369118x.2017.1406973>

Harrell A, Greenleaf AS (2023) Resource asymmetry reduces generosity and paying forward generosity, among the resource-advantaged and disadvantaged. *Soc Sci Res* 109:102786. <https://doi.org/10.1016/j.ssresearch.2022.102786>

Hepp A (2020) The fragility of curating a pioneer community: deep mediatization and the spread of the quantified self and maker movements. *Int J Cultural Stud* 23(6):932–950. <https://doi.org/10.1177/1367877920922867>

Hoffmann J, Glückler J, (2022) Navigating uncertainty in networks of social exchange: a relational event study of a community currency system, SOCIO-ECON REV mwac066, <https://doi.org/10.1093/ser/mwac066>

Homans GC (1961) Social behavior: Its elementary forms. Harcourt, Brace

Horak M, Vanhooren S (2023) Somebody to lean on: community ties, social exchange, and practical help during the COVID-19 pandemic. *CITY COMMUNITY* 0(0). <https://doi.org/10.1177/15356841231159370>

Huff L, Kelley L (2003) Levels of organizational trust in individualist versus collectivist societies: a seven-nation study. *Organ Sci* 14:81–90. <https://doi.org/10.1287/orsc.14.1.81.12807>

Kanitsar G (2019) Solidarity through punishment: An experiment on the merits of centralized enforcement in generalized exchange. *Soc Sci Res* 78:156–169. <https://doi.org/10.1016/j.ssresearch.2018.12.012>

Kerstetter K, Bonner D, Cleland K et al. (2023) Social solidarity, social infrastructure, and community food access. *AGRIC HUMAN VALUES*. <https://doi.org/10.1007/s10460-023-10428-4>

Kolers A (2021) What does solidarity do for bioethics? *J Med Ethics* 47(2):122–128. <https://doi.org/10.1136/medethics-2019-106040>

Lapinski MK, Rimal RN (2005) An explication of social norms. *Commun Theor* 15:127–147. <https://doi.org/10.1111/j.1468-2885.2005.tb00329.x>

Lawler EJ (2001) An affect theory of social exchange. *Am J Sociol* 107:321–352. <https://doi.org/10.1086/324071>

Lawler EJ, Thye SR, Yoon J (2008) Social exchange and micro social order. *Am Sociol Rev* 73(4):519–542. <https://doi.org/10.1177/000312240807300401>

Liao W, McComas KA, Connie Yuan Y (2017) The influence of unrestricted information exchange on willingness to share information with outsiders. *Hum Commun Res* 43(2):256–275. <https://doi.org/10.1111/hcre.12104>

Liao W, Yuan YC, McComas KA (2018) Communal risk information sharing: motivations behind voluntary information sharing for reducing interdependent risks in a community. *Commun Res* 45(6):909–933. <https://doi.org/10.1177/0093650215626981>

Liu N, Wang R (2022) From disembedding to digital re-embedding: social media empowerment and solidarity practices of Chinese truck drivers. *SOC MEDIA SOC* 8(2). <https://doi.org/10.1177/20563051221108409>

Molm LD, Collett JL, Schaefer DR (2007) Building solidarity through generalized exchange: a theory of reciprocity. *Am J Sociol* 113(1):205–242. <https://doi.org/10.1086/517900>

Molm LD (2010) The structure of reciprocity. *Soc Psychol Quart* 73(2):119–131. <https://doi.org/10.1177/0190272510369079>

Molm LD, Collett JL, Schaefer DR (2006) Conflict and fairness in social exchange. *Soc Forces* 84(4):2331–2352. <https://doi.org/10.1353/sof.2006.0100>

Molm L, Cook KS (1995) Social exchange and exchange networks. In K. S. Cook, G. A. Fine, and J. S. House (Eds.), *Sociological Perspectives on Social Psychology* (pp. 209–235). Boston: Allyn & Bacon

Molm LD, Melamed D, Whitham MM (2013) Behavioral consequences of embeddedness. *Soc Psychol Quart* 76(1):73–97. <https://doi.org/10.1177/0190272512468284>

- Molm LD, Schaefer DR, Collett JL (2009) Fragile and resilient trust: risk and uncertainty in negotiated and reciprocal exchange. *Sociol Theor* 27(1):1–32. <https://doi.org/10.1111/j.1467-9558.2009.00336.x>
- Molm LD, Takahashi N, Peterson G (2003) In the eye of the beholder: procedural justice in social exchange. *Am Sociol Rev* 68:128–152. <https://doi.org/10.2307/3088905>
- Nie Y, Zhong X, Lin T, Wang W (2022) Homophily in competing behavior spreading among the heterogeneous population with higher-order interactions. *Appl Math Comput* 432:127380. <https://doi.org/10.1016/j.amc.2022.127380>
- Schaefer D (2009) Resource variation and the development of cohesion in exchange networks. *Am Sociol Rev* 74:551–572. <https://doi.org/10.1177/000312240907400403>
- Simpson B, Willer R (2015) Beyond altruism: sociological foundations of cooperation and prosocial behavior. *Annu Rev Sociol* 41:43–63. <https://doi.org/10.1146/annurev-soc-073014-112242>
- Simpson B, Harrell A, Melamed D, Heiserman N, Negraia DV (2017) The roots of reciprocity: gratitude and reputation in generalized exchange systems. *Am Sociol Rev* 83(1):88–110. <https://doi.org/10.1177/0003122417747290>
- Small ML (2022) Ethnography upgraded. *Qual Sociol* 45(3):477–482. <https://doi.org/10.1007/s11133-022-09519-1>
- Spillman L, Strand M (2013) Interest-Oriented Action. *Annu Rev Sociol* 39:85–104. <https://doi.org/10.1146/annurev-soc-081309-150019>
- Stewart M, Schultze U (2019) Producing solidarity in social media activism: the case of my stealthy freedom. *Inf Organ* 29:100251. <https://doi.org/10.1016/j.infoandorg.2019.04.003>
- Swidler A (1986) Culture in action: symbols and strategies. *Am Sociol Rev* 51:273–286. <https://doi.org/10.2307/2095521>
- Vachhani SJ, Pullen A (2019) Ethics, politics and feminist organizing: writing feminist infrapolitics and affective solidarity into everyday sexism. *Hum Relat* 72(1):23–47. <https://doi.org/10.1177/0018726718780988>
- Wang B, Liu Y, Qian J, Parker SK (2023) Help anyone, if helped by some: understanding generalized reciprocity through the lens of interaction ritual chain theory. *J Occup Organ Psych* 00:1–23. <https://doi.org/10.1111/joop.12442>
- Whitham MM (2017) Paying it forward and getting it back: the benefits of shared social identity in generalized exchange. *Sociol Perspect* 61(1):81–98. <https://doi.org/10.1177/0731121417712492>
- Whitham MM (2021) Generalized generosity: how the norm of generalized reciprocity bridges collective forms of social exchange. *Am Sociol Rev* 86(3):503–531. <https://doi.org/10.1177/00031224211007450>
- Willer R, Flynn FJ, Zak S (2012) Structure, identity, and solidarity. *Admin Sci Quart* 57(1):119–155. <https://doi.org/10.1177/0001839212448626>
- Xiang B (2021) The nearby: a scope of seeing. *J Contemp Chin Art* 8(2):147–165. https://doi.org/10.1386/jcca_00042_1
- Yan Y (1996) *The Flow of Gifts: Reciprocity and Social Networks in a Chinese Village*. Stanford University Press, Stanford
- Yao JJ, Zhang Z-X, Brett J, Murnighan JK (2017) Understanding the trust deficit in China: Mapping positive experience and trust in strangers. *Organ Behav Hum Dec* 143:85–97. <https://doi.org/10.1016/j.obhdp.2016.12.003>

Acknowledgements

This research was supported by grants from the National Natural Science Foundation of China (Grant No. 72003114).

Author contributions

Both authors contributed substantially to this study in conceptualization, methodology, investigation and writing. Y.Z. conducted data collection and analysis. C.D. performed review and editing, and supervised the development of this study. The final manuscript has been approved by both authors.

Competing interests

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Ethical approval

The study was conducted according to the guidelines of the Personal Information Protection Law of the People's Republic of China. All participants provided informed consent after having the study described to them before data collection activities. All data were collected, processed, and analyzed anonymously, in line with the ethical principles of the 1964 Helsinki Declaration and its later amendments. Ethical clearance and approval were granted by the ethics committee at Shanghai University of Finance and Economics.

Informed consent

Informed consent was obtained from all participants and/or their legal guardians for participation in the study. All data collected was anonymous and confidential without showing any private information of participants. The photos presented in this study were provided by our respondents, which are permitted and authorized to be reproduced.

Additional information

Correspondence and requests for materials should be addressed to Chen Dong.

Reprints and permission information is available at <http://www.nature.com/reprints>

Publisher's note Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.



Open Access This article is licensed under a Creative Commons Attribution 4.0 International License, which permits use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons license, and indicate if changes were made. The images or other third party material in this article are included in the article's Creative Commons license, unless indicated otherwise in a credit line to the material. If material is not included in the article's Creative Commons license and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder. To view a copy of this license, visit <http://creativecommons.org/licenses/by/4.0/>.

© The Author(s) 2023