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Impact of Heterogeneous Prior Contribution on Reciprocity in Online Sellers' Community

Completed Research Paper

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Abstract

This study explores how different types of resources a seller contributes in the online community will trigger others' reciprocity, reflected by the responses the seller's threads receive. Drawing on social exchange theory and using machine learning techniques, we identify two important types of resources transferred in an online sellers' community: informational resource and instrumental resource. Our findings reveal that a seller's provision of informational resource is positively associated with the responses the seller's threads receive, while a seller's provision of instrumental resource is negatively associated with the responses the seller's threads receive. Moreover, the effect is moderated by the types of resources sought by a certain thread. Specifically, both effects are strengthened for threads that seek informational resource and undermined for threads that seek instrumental resource. The study contributes to the understanding of online reciprocity by uncovering the differing impact of different contribution and its boundary condition.

Keywords: Online community, Reciprocity, Social exchange, Social outcome

Introduction

The increasing prevalence of online communities has provided plentiful and various spaces for social interactions. Forum-based communities are among earliest and the most classical types of online communities, which have covered almost all different social or professional groups of internet users (Johnson et al. 2015). The interactions in online communities facilitate the transfer of multiple types of resources among different individuals. For instance, patients who have suffered from similar health issue could obtain various types of social support (e.g. information and emotional support) from each other in an online healthcare community (Wang et al. 2014). Such forum-based online communities are also increasingly adopted by participants in ecommerce market to access useful information and resources. For online consumers, online community act as an important source of product information generated from other consumers' experience (Bickart and Schindler 2001). For individual online sellers, online community provide channels to acquire relevant knowledge, emotional support, and market base from their peer sellers (Wang et al. 2013).

Individuals have benefited from the resource obtained in online communities. In online healthcare community, for instance, researchers demonstrate that the social support a patient receives from others is effective in improving the patient's health status (Yan and Tan 2014). Similarly in the context of ecommerce, researchers also propose that the information and market base an online seller obtains from the online communities might help the seller to better perform and survive in the ecommerce market (Wang et al. 2013). Such benefits are all embedded in the responses from the community. Moreover, receiving responses by itself is also valuable and meaningful for individuals participating in online community, as it satisfies individuals' psychological needs of attention and concerns (Moon and Sproull 2008). Hence, receiving responses is found helpful in sustaining participation of community newcomers,

even if the received responses are not directly relevant to the newcomers' original posts (Joyce and Kraut 2006). Besides, as most online forums sort threads based on when the threads receive their newest responses, the received responses can at least help increasing the exposure of the threads.

While the responses represent the useful or valuable resource that one could access in online communities, they are often not evenly distributed to all individuals engaging in the same community. A prior study on online communities of newsgroups has documented that 27% of all online posts fail to receive any response from others (Arguello et al. 2006). The value of such resource in online communities and the uncertainty of acquiring the resource raise the question: How could an individual effectively leverage the online communities to obtain resource from others? In particular, what could an individual do to increase the responses s/he receives?

One's potential to receive responses links to the mechanism of how the interactions are generated in online communities. Prior research regards the interactions in online communities as a form of social exchange (Faraj and Johnson 2011), which may generate future obligations among the community members (Monge and Contractor 2003). The formation of online interactions is thus largely driven by the mechanism of reciprocity (Gu et al. 2008). Broadly speaking, reciprocity emphasizes that the contribution made in the past determines the return in the future (Gouldner 1960). The more an individual contribute to others in an online community, the more support the individual will receive from others. Specifically, an individual's prior contribution is not necessarily reciprocated by its direct recipient (direct reciprocity) but is also reciprocated by other third parties (indirect reciprocity) (Flynn 2005).

The significance and prevalence of reciprocity in online communities are widely evidenced by the literature investigating the dynamics of people's online interactions (Faraj and Johnson 2011). For instance, Arguello et al. (2006) show that newcomers with little prior contribution are less likely to receive responses in the discussion forums. In online Q&A communities, Wu and Korfiatis (2013) demonstrate that people who answer questions in various topic categories are more likely to receive answers to their own questions as compared to people who focus on contributing to very few topic categories. However, Current literature mainly focuses on whether and how contributing information might lead to future reciprocation. Little attention has been paid to the effect of other types of contribution, although researchers have shown that community participants exchange multiple types of resources and support (Yan and Tan 2014). For instance, literature on online health community has shown that in addition to sharing health-related knowledge, the patients in online communities also exchange tangible aids (Coulson 2005). While researchers mentioned that tangible and concrete resource could be exchanged differently from intangible resource (Foa and Foa 1980), few empirical study has investigated whether such tangible types of contribution trigger different sort of reciprocity and returns. Hence, researchers have called for more studies on how different types of resource are linked to different forms of exchange (Cropanzano and Mitchell 2005). In response to such call, our research question is to examine whether an individual's contribution of different resources affect the responses s/he receives in the online community, which could provide a more nuanced understanding on why some individuals receive more support than others in the same online community.

To answer our research question, we use a dataset collected from a large forum-based online community (Taobao Forum) specializing in serving ecommerce sellers. We rely on the textual data of the forum messages to infer different types of resource exchanged among sellers. Our findings reveal that a seller's contribution of different resources is associated with the responses s/he receives differently. While the provision of informational resource increases the responses received, the provision of instrumental resource decrease the responses received. Besides, the association between the responses a thread receives and its author's prior contribution is moderated by the types of resources the thread seeks.

Research Context

The research context of our study is Taobao Forum, which is operated by Taobao, a popular C2C ecommerce platform in China. Due to the keen competition in ecommerce market, the sellers are interested in engaging in interactions that may help them overcome the difficulties and improve their sales. In response to such demands, the world's leading C2C ecommerce platform, Taobao, has launched an online discussion forum, Taobao Forum (bbs.taobao.com). The users interact in Taobao Forum by posting new threads and by replying to existing threads. While Taobao does not restrict forum

participants to only sellers on Taobao, the forum has evolved such that many topic sections are particularly relevant to online sellers. The sellers thus become the major participators in the community. Specifically, according to the data we collected, 97% of the threads and 80% replies are posted by participants who have owned online shops in Taobao Marketplace. An important feature of Taobao Forum is that it displays the hyperlinks of the participants' online shops, such that sellers in the forum could not only post messages but also access the online shops of each other.

Theory and Hypothesis

Online Social Exchange and Reciprocity

Social interactions in online community has long been characterized as a form online social exchange (Faraj and Johnson 2011), through which people could provide or receive different tangible and intangible resources. The formation of social exchange is mainly characterized by reciprocity. According to social exchange theory, no matter what resources are exchanged, the provider is at least partially expecting some form of return (Blau 1964). Other people are also likely to help this provider due to their feeling of obligation to reciprocate the favor (Arguello et al. 2006; Gouldner 1960). Reciprocity offers a useful theoretical lens to understand why people might differ in the likelihood of receiving others' responses when posting threads in the same forum. While people's contribution behaviors could be driven by diverse motivations based on either self-interest (Wasko and Faraj 2005) or altruisms (Peddibhotla and Subramani 2007), reciprocity could affect who is more likely to receive these contributions. In particular, researchers highlight that the dominant role of indirect reciprocity in linking the prior contribution and the future returns in online context (Wasko et al. 2009). Indirect reciprocity, also termed as collective reciprocity (Ekeh 1974; Wu and Korfiatis 2013), emphasizes that a contributor is exchanging resources with the community as a whole rather than those direct beneficiaries. As a result, the contributor might be reciprocated by anyone in the online community in the future.

Online communities offer an ideal context for indirect reciprocity, as the communication and interactions in online communities are open and public (Wu and Korfiatis 2013). One's behaviors and contribution in an online community can be easily observed by other community participants. Hence, many people attempt to enhance their reputation and social status among other community members by contributing valuable resource (e.g. information and knowledge) in online communities (Lampel and Bhalla 2007; Wasko and Faraj 2005). Prior research indeed documents that community participants' perception and evaluation of someone are affected by this person's prior behaviors in the community, which indicates that individuals can to some extent monitor and track others' behaviors (Dahlander and O'Mahony 2011). For instance, individuals making more knowledge contribution in an online community are more likely to be recognized as leaders by other community participants (Faraj et al. 2015). With the impression of others' behaviors, individuals can reciprocate those with more contribution and punish those with little contribution accordingly (Arguello et al. 2006; Wu and Korfiatis 2013).

Types of Resource and Forms of Exchange

While reciprocity characterize the forms of social exchange, another important focus of social exchange literature is the content of the exchanges. Literature has the resources in exchange can be categorized based on their concreteness, which refers to the forms of expression characteristic of various resources. Resources that are conveyed through performing tangible activities are considered highly concrete, while resources that are conveyed by language and gestures are less concrete (Foa and Foa 1980). Similarly, Cook et al. (2013) also emphasized that individuals could exchange both tangible and intangible activities and resources. In line with this categorization, we identify two types of resources that are often highlighted in online community literature: informational resource and instrumental resource. (Coulson 2005; LaCoursiere 2001; Wang et al. 2014). We choose to focus on these two types because they are highly representative of tangible and intangible resource exchanged in online communities. Specifically, informational resource refers to information, opinions, or suggestions (Langford et al. 1997; Wang et al. 2014), which captures the intangible resource. Instrumental resource, on the other hand, refers to tangible aid, service, or activity provided for the benefit of its recipient (in the case of online sellers, for the benefit of recipient's shops) (Barrera 1986; Langford et al. 1997), which captures the tangible resource.

Prior literature also highlights that the exchange of different types of resource might be governed by different norms or rules (Cropanzano and Mitchell 2005). In general, resources with high concreteness or tangibility are often exchanged in a short-term, quid pro quo fashion, which is termed as negotiated exchange, while intangible resources are often exchanged in an open-ended manner (Cropanzano and Mitchell 2005; Foa and Foa 1980), which is termed as generalized exchange. Since instrumental resource and informational resource differ in their tangibility, they are likely to be exchanged in different forms. Specifically, the informational resource is expected to be exchanged in a form of generalized exchange due to its intangibility, while the instrumental resource is expected to be exchanged in a form of negotiated exchange as it is highly tangible.

We propose that individuals' choice of providing instrumental resource and informational resource reflects their preference towards negotiated exchange and generalized exchange respectively. Prior literature highlights that individuals engaging in negotiated exchanges are mainly motivated by a strong concern of personal interests, while individuals engaging in generalized exchange are mainly motivated by the concern of collective welfare (Flynn 2005). Others are thus able to infer different intention from the provision of informational resource and the provision of instrumental resource. Since reciprocity is a behavioral response to the perceived cost, consequence, and intention underlying one's action (Falk and Fischbacher 2006; Stanca 2010), we would expect the reciprocation an individual could receive to be associated with what the individual actually provides in the online communities.

Impact of Providing Informational and Instrumental Resource

Informational resource is quite task-oriented and aims to address the major concern of the community. While it might guide its recipients to solve problems and overcome difficulties, informational resource does not guarantee any return to its providers (Wasko and Faraj 2005). Since the recipients do not necessarily possess valuable information or knowledge that fits the providers' needs, informational resource is usually provided voluntarily and unconditionally. Due to the scarce and intangible nature of information, the exchange of informational resource is best characterized by generalized exchange (Cropanzano and Mitchell 2005). In the context of Taobao Forum, typical examples of providing informational resource could be posting answers to others' questions or directly sharing knowledges and experience by post threads.

Prior research demonstrates that individuals who engage in generalized exchange are mainly motivated by a concern of collective interest rather than personal interests (Flynn 2005), and they show strong willingness to take risks for the welfare of the whole community (Molm 2010). Since the information shared in online communities is public and easy to be disseminated, the providers might even lose the advantages of owning the information privately (Serenko and Bontis 2016). Due to the uncertain return and relatively high cost of providing informational resource, other sellers are likely to perceive an altruistic intention underlying such contribution behaviors. This perception of good intention helps the providers to build a favorable social image in the community (Wu and Korfiatis 2013). As people generally feel obligated to reward kind intention, sellers who provide more information resource are more likely to be reciprocated by others in the future.

Hypothesis 1. The more a seller provides informational resource, the more responses the seller's thread will receive.

Instrumental resource in Taobao Forum is usually behaviors of visiting others' shop or adding others' products into favorite. Such behaviors could increase the exposure of the recipients' products, as products with more visits and favorites obtain higher priority to be displayed to consumers. Unlike information or knowledge that is often possessed by only a certain group of people (Serenko and Bontis 2016), instrumental resource is not unique and can be provided by almost every seller in the community. Due to the tangible nature of instrumental resource (Foa and Foa 1980), sellers can easily measure and compare the instrumental resources they provide with those they receive. Thus, instrument resource is mostly exchanged in a form of negotiated exchange (Cropanzano and Mitchell 2005). a seller usually provides instrumental resource to people who promise to return the favor or people who have already provided instrumental resource to the focal seller. The form of negotiated exchange can be verified by the textual content of forum messages. A typical example may be an appeal by Seller B to others in the community to visit his/her shop and favorite some products, with the promise of reciprocal action. Seller A may then perform the requested act to seller B and inform Seller B of the actions taken by posting a reply. Seller B

will reciprocate with similar behavior to Seller A. Forum messages relevant to exchanging instrumental resource are often about requesting or reporting such behaviors.

In sum, instrumental resource is provided based on an assumption that the providers also benefit from the recipients equivalently. Since the provision of instrumental resource often leads to bilateral benefits for both providers and recipients (Molm et al. 2007), others would not feel obligated to offer reciprocation. Moreover, Prior research highlights that the form of negotiated exchange usually attracts individuals who are motivated to act solely on their own interests, because negotiated exchange allows them to ensure the outcome of each transaction and track “the repayment of outstanding debt” (Flynn 2005). Hence, a seller’s active engagement in providing instrumental resource may indicate that s/he prioritize his personal interests over others’. Other sellers could perceive a self-interest intention underlying such behaviors. By providing instrumental resource, a seller may create a social image that the seller contributes only when there’s satisfactory return. Besides, negotiated exchange minimize the risk and uncertainty of nonreciprocity, which is necessary to the development of interpersonal trust (Molm et al. 2009). A seller’s engagement in negotiated exchange reflects her/his avoidance of risk, thus preventing the seller from building strong affective bonds with the community (Molm 2010). Prior literature also demonstrates that restricted and immediate reciprocation will lead to a distrustful and brittle social relationship, resulting in low solidarity and high tension among the social group (Ekeh 1974; Uehara 1990). Thus, other sellers may perceive less and weaker emotional bonds with sellers who focus on exchanging instrumental resource. Such perception eventually inhibits people from responding to the providers’ threads.

Hypothesis 2. The more a seller provides instrumental resource, the fewer responses the seller’s thread will receive.

Moderating Effect of Resource being Sought

In addition to providing different types of resources in the online community, the sellers also seek resources from others. The types of resources sought by a thread are usually explicitly stated in its textual content. Since informational resource and instrumental resource are exchanged in different forms, the types of resources sought by a thread create the context for its potential responders to consider whether to respond to this particular thread. Thus, while a seller’s prior contribution of different resources could impact the responses the seller’s threads could receive in general, it is also important to explore whether such impact might vary across threads seeking different types of resources.

Cropanzano and Mitchell (2005) differentiate the concept of exchange relationship from the concept of exchange transaction. Exchange relationship refers to the interpersonal attachments resulted from a series of prior exchange transactions. Two individuals with either social or economic relationship could engage in either social or economic transactions. While the match between the relationship and the transaction lead to a smoother exchange, the mismatch between the relationship and transaction could impede the transaction due to greater risk of psychological injury and higher emotional labor. In line with this perspective, we propose that the match and mismatch between what a seller contributes previously and what the seller seeks in the current thread could affect the responses the thread receives. Specifically, a seller’s provision of different resources determines how others perceive the seller’s relationship with the community. The provision of instrumental resource indicates a relationship of negotiated exchange, which is more economic in nature. The provision of informational resource indicates a relationship of generalized exchange, which is more social in nature. Meanwhile, the content of a thread specifies the form of exchange for the current transaction the thread author is initiating. Alignment between the author’s prior contribution and the current transaction will help the thread to attract more responses, while misalignment between the contribution and the current transaction will inhibit the thread from receiving responses. Next, we introduce how the effect of sellers’ different types of contribution is moderated by the types of resource sought in the thread.

Threads seeking informational resource

Threads seeking information usually contain textual content about asking questions or requesting suggestions and advice. By posting such threads, the sellers are initiating exchange transactions with unilateral benefits. While authors of information-seeking threads may benefit from others’ responses,

they can hardly reciprocate the responders with equivalent benefits immediately. The possible future benefit to the responders, if exist, is likely to be provided by some third parties (Wu and Korfiatis 2013), and neither the authors or the responders have any control over it. Hence, a thread that seeks informational resource is initiating a transaction of generalized exchange. Its responders cannot be reciprocated immediately and would experience a higher risk of non-reciprocity (Molm et al. 2007). Meanwhile, responding threads seeking information could be costly, as the disclosure of one's private information might result in the loss of informational advantage (Serenko and Bontis 2016). Since the authors of information-seeking threads attempt to acquire high-value resources without direct repayment, the potential responders will perceive higher unfairness due to the imbalanced distribution of benefit (Falk and Fischbacher 2006). In order to be reciprocated in the future, the providers of informational resource would expect the recipients are similarly motivated and can sustain the forms of generalized exchange by making similar contribution to others (Flynn 2005).

The thread authors' prior contribution of informational resource would be aligned with the current transactions initiated by information-seeking threads. As illustrated before, sellers engaging in generalized exchanges are more concerned about collective welfare (Flynn 2005). A seller's active contribution of information indicates that the seller is willing to take risks for the benefit of the whole community (Molm 2010). The prior experience of taking risks makes others perceive more fairness when the seller tries to seek informational resource from others. Specifically, if the thread authors have taken the risk of non-reciprocity, they deserve to be repaid in the same way. Hence, the positive impact of the sellers' provision of informational resource is stronger in threads that seek informational resource.

Hypothesis 3a. The positive association between the informational resource a seller provides and the responses the seller's thread receives becomes more positive when the thread is seeking informational resource.

In contrast, the thread authors' prior contribution of instrumental resource would be misaligned with the transaction in information-seeking threads. As instrumental resource is provided based on a norm of negotiated exchange, the provision of instrumental resource indicates a self-interest intention (Flynn 2005). If a seller used to provide resources to exchange equivalent return, others will perceive more unfairness when the seller attempts to seek support without immediate repayment (Cox et al. 2007). Hence, the seller's self-interest intention is more unfavorable in information-seeking threads, and the negative impact of the sellers' provision of instrumental resource is more salient.

Hypothesis 3b. The negative association between the instrumental resource a seller provides and the responses the seller's thread receives is becomes more negative when the thread is seeking informational resource.

Thread seeking instrumental resource

Threads seeking instrumental resource contains content about asking for others' tangible assistance (e.g. visiting or adding products into favorite) and the promise of repayment. By posting such threads, the sellers are initiating transactions characterized by the form of negotiated exchange. The benefit of exchanging instrumental resource is bilateral (Molm et al. 2007). While thread authors benefit from the responders' instrumental resource, they are also required to reciprocate the responders with equivalent instrumental resource. In other words, responders would expect a reciprocation of instrumental resource from the thread author. Prior literature demonstrates that tangible rewards could reinforce one's extrinsic motivation but reduce the salience of intrinsic motivation (Deci and Ryan 1975). Similarly, the promised repayment could weaken the sellers' motivation to reward kind intention and punish unkind intention (Cox et al. 2007). Instead, responders are more concerned about whether the thread authors will immediately reciprocate them with the promised repayment when they respond to threads seeking instrumental resource.

The thread authors' prior contribution of informational resource is misaligned with transactions initiated by threads seeking instrumental resource. As the major purpose of providing instrumental resource is to exchange equivalent extrinsic return, the responders of instrumental threads do not care much about the kindness of thread authors' intention. The thread authors' prior contribution of informational resource becomes less relevant in this scenario. Moreover, while the negotiated exchange is relatively economic and transactional, the relationship developed from exchanging informational resource is more social in nature

due to the providers' altruistic intention (Molm et al. 2007). Prior literature emphasizes that mismatch between the economic transaction and the social relationship will cause additional emotional labor for the exchange parties (Cropanzano and Mitchell 2005). To avoid such emotional labor, authors with less informational contribution might be more preferable to the responders of instrumental threads. Thus, the positive impact of providing informational resource is weakened in threads seeking instrumental resource.

Hypothesis 4a. The positive association between the informational resource a seller provides and the responses the seller's thread receives becomes less positive when the thread is seeking instrumental resource.

The thread authors' prior contribution of instrumental resource is aligned with transactions initiated by threads seeking instrumental resource. As the current transactions are in a form of negotiated exchange, responders of such type of threads are motivated to obtain immediate returns (Molm et al. 2007). Although thread authors' engagement in exchanging instrumental resource may indicate their self-interest (Flynn 2005), such perceived self-interest does not play an important role in the responders' decisions. Prior research highlights that negotiated exchange will make the conflictual elements more salient (Molm 2010). A seller cannot continuously find exchange partners if s/he fails to abide by the agreement. Hence, a seller's abundant experience of exchanging instrumental resource may signal her/his reliability and credibility in reciprocating others' instrumental resource. Therefore, when responding to threads that request instrumental resource, the responders are likely to select threads posted by authors with more experience in providing instrumental resource. The impact of providing instrumental resource is less negative.

Hypothesis 4b. The negative association between the instrumental resource a seller provides and the responses the seller's thread receives becomes less negative when the thread is seeking instrumental resource.

Figure 1 presents the overall framework of all hypotheses.

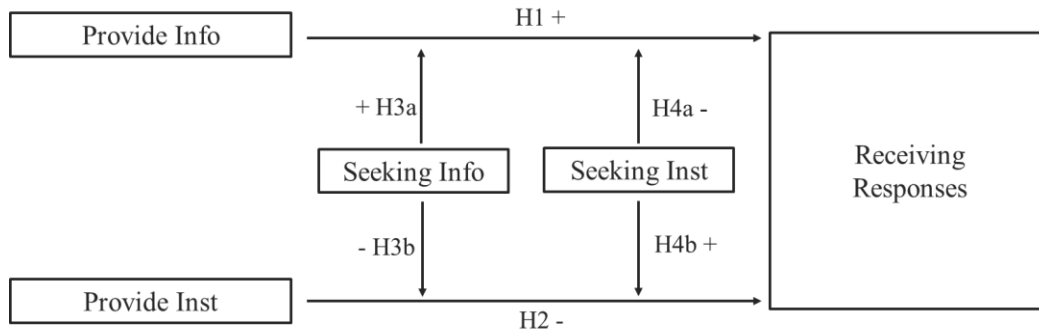


Figure 1. Framework of Hypotheses

Methodology

Identifying Informational and Instrumental Resource

The dataset collected from Taobao Forum consists of 1,311,395 threads posted by 306,048 different sellers between February 2014 and December 2014. The replies under these threads are also collected, so that we could track the thread authors' prior activities and the responses each thread receives. As our dataset is too large to be coded manually, we adopt text classification algorithms to identify whether a thread or reply contains content about informational resource or instrumental resource. We first generate a training and testing dataset by manually coding a random sample of 2,000 threads, classifying each thread with the two types of resources. For these manually coded messages, we randomly split the sampled data into two parts, with half of the sample as the training dataset and the other half as the testing dataset. We then use a classification model, which first learns the relationships between the textual content and each type of resources exhibited in the training dataset. Based on the learnt relationships, the model then predicts the existence of each type of social exchange given the content of a new thread, and the testing dataset is used to check the accuracy of the model.

When coding content on informational resource, we notice that the messages seeking information are quite different from the messages sharing or providing information. This is reasonable because the exchanges of information are generally unidirectional. To better capture the flow of informational resource, we code the information-seeking content and information-sharing content separately. One thread can be coded as representing none, one or multiple types of content. Hence, each thread has three labels corresponding to the three types of content (information-seeking, information-sharing, instrumental). Eventually, we identify 567 threads with content of instrumental resource, 457 threads with information-seeking content, and 347 threads with information-sharing content.¹

We code the originating thread post, as it conveys the main intent of the communication. However, not all replies under a thread is strictly related to the thread's main intent, so it is necessary to consider content of replies under the threads as well. Hence, we sample 1600 replies under the sampled threads and code their contents. We first apply similar approach to reply sample as we did with thread sample, so each reply is coded for whether it contains each of the three types of content. In addition, as replies sometimes need to be interpreted within the context of the originating message, coding them as messages independent from the originating type of thread might not sufficiently capture the flow of resources, especially for replies with very short text. For instance, a reply with only a few thankful words might not be coded as containing information-seeking content by itself, but it could indicate receiving of informational resource if it is under a thread with information-sharing content. Thus, for replies under each type of thread, we also manually code for whether each reply was relevant to the intent of the main thread. If a reply is not considered as relevant to any type of the thread nor directly containing any type of content by itself, it will be regarded as a spam reply (or irrelevant reply), which is not considered an effective interaction. To ensure accuracy, an author and a research assistant code all sampled threads and replies independently. The overall agreement between their coding results is 90.6%. Inconsistent coding results are discussed to reconcile and finalize the coding. Table 1 provides examples of each type of content and examples of relevant content shown in replies.

Table 1. Examples of Content being Coded		
Type	Content Example	Content as relevant to thread type
Instrumental	Exchange “visit” and “favorite”. Must visit back.	I've seen your shop. It looks beautiful.
Info-seeking	What is the impact if I delete products with no storage? Any regulation for such deletion?	The video can be made in this way. Please refer to this url...
Info-sharing	Today I will introduce a few helpful and necessary video tools for the shop web design...	Great! Thanks for sharing this.

Table 1. Examples of Content being Coded

We use RTextTools (Jurka et al. 2012), a popular R package, to conduct the textual classification. Specifically, we train algorithms for each type of content label (information-seeking, information-sharing, instrumental) respectively, such that a selected algorithm is only specialized in classifying one type of label. The package offers eight famous and popular classification models. As we are not sure which model can provide the most accurate classification for our data, we follow the approach of Jurka et al. (2013), trying all eight classification algorithms - supported vector machine (SVM), general linearized model (Glmnet), maximum entropy (MaxEnt), Decision Tree (TREE), Random Forest (RF), scaled linear discriminant analysis (SLDA), LogitBoost (Boosting), and bootstrap aggregation (Bagging) - to find the algorithm with the best prediction performance for each classification task.

¹ Since a thread could contain none of the 3 types of content or multiple types of content, the sum of the threads containing each type of content may not necessarily equal to the sample size.

The package works by extracting keywords from the text for each thread². Specifically, RTextTools could automatically transform all these the textual documents into a document-term-matrix, in which each row represents a document, and each column represents a distinct term. Therefore, each textual document (represented by a row) is transformed into a vector indicating the existence of the keywords, while each cell of the matrix indicates the frequency of the term appeared in the document. Based on this matrix and the manually coded labels of these documents, each algorithm or model applies its own logic to learn the relationship between the vectors of keywords and the corresponding labels. Eventually, each algorithm will formulate its own criterion that can be used to classify the rest of the text.

To compare the performance of each algorithm, we consider two performance measures: accuracy and ROC Area, which are often used to evaluate the performance of classification algorithms (Wang et al. 2014). The algorithm that performed the best in predicting the testing dataset was selected to complete that classification task (e.g. whether a thread contains content on instrumental resource) on the textual messages we collected. These algorithms are trained with the dataset we manually code. In sum, the adopted classifiers achieve accuracy ranging from 0.795 to 0.946, and Roc Area ranging from 0.818 to 0.979. To further validate the classification results, we randomly select another sample of messages (500 threads and 500 replies) and compare manual coding with classification of algorithms based on this new sample. It shows that the classification of algorithm achieves an overall accuracy of 0.854 (range from 0.71 to 0.938).

We further aggregate the classification results of replies. Specifically, labels of whether a reply is relevant to a certain type of thread are aggregated with labels of whether a reply contains a certain type of content if they represent flows of similar resource. For instance, replies relevant to information-seeking threads are merged into replies with information-sharing content as they both indicate the provision of informational resource. Similarly, replies relevant to information-sharing threads are merged into replies with information-seeking content as they both indicate receiving of informational resource. The same approach also applies to replies on instrumental resource.

Constructing Variables

Based on the classification results of forum messages' content, we rely on the reply-to relationship to infer the flows of different resources transferred among sellers. The informational resource and instrumental resource a seller provides before posting a particular thread are thus captured accordingly. The classification results are also used to infer the resources sought by each thread. The unit of analysis for the present study is at thread level, so each thread constitutes an observation. For each thread, we further track the responses it receives and its author's prior activity. Specifically, in order to make sure threads posted at different time comparable, variables about a thread's responses and its author's prior activities are constructed based on a fixed time window of 30 days. Details of variables are illustrated in below.

Dependent variable – received responses

The dependent variable, represented by *NumReponses*, refers to the number of responses that the thread has received within 30 days since it was posted. For instance, if a thread is posted on July 1st, the responses it receives by July 31 will be considered, while the rest are ignored. We adopt a time window of 30 days to track the responses received by a thread because it is sufficient to capture the majority of the responses. In our context, 88.5% responses are received within 30 days since the threads was posted. Besides, highly delayed responses might not be useful to the thread author anymore.

Independent variables – provision of informational and instrumental resource

We adopt reply-to relationships and the classification results of forum messages explained above to infer how the flows of instrumental resource and informational resource are transferred among people. In particular, we focus on the informational resource and the instrumental resource provided by each seller.

² The forum messages are written in Chinese, which does not have spaces or delimiters between words. Before using the RTextTools to process the textual data, we segment the words of all messages with IKAnalyzer, a Java package designed for segmenting Chinese text.

To provide informational resource, one can either answer others' questions or directly share information. When seller A posts an information-sharing message to respond seller B's information-seeking message, we consider it as an effective provision of informational resource from A to B. When seller A posts an information-seeking message to respond seller B's information-sharing message, we consider it as an effective provision of informational resource from B to A. consequently, we calculate the number of people a seller provides information to (*InfoPro*) to represent the seller's provision of informational resource.

The provision of instrumental resource is ruled by a norm of negotiated reciprocity. This indicates that individuals initiating the exchange of instrumental resource will return the favor when they receive others' instrumental resource. Hence, when seller A posts a message on instrumental resource to respond B's message on instrumental resource, we consider an effective provision of instrumental resource from A to B and an effective provision of instrumental resource from B to A. We calculate the number of people a seller provides instrumental resource to (*InstPro*) to represent the seller's provision of instrumental resource.

Control variables

The responses a thread could receive might be largely determined by the textual content of the thread itself. For instance, a thread explicitly seeking instrumental resource might be able to attract more responses since almost everyone in the community is capable to reply it, whereas a thread seeking information might be replied by only limited number of knowledgeable people. We construct 3 dummy variables - *DummyInst*, *DummySeekInfo*, *DummyShareInfo* – to control whether a thread contains content about instrumental resource, seeking information, and sharing information respectively. In addition, we also control the length of the thread title and content with *TitleLen* and *ContentLen*, and the length of the text could reflect how much effort the authors made in writing the threads.

Besides, the responses received by a thread might also be affected by its author's experience in the forum. A seller who has join in the community for longer time may be more familiar with the tastes and preferences of other community members, and thus know how to frame the threads to attract others' responses. Hence, we control the tenure of a seller upon posting a thread with *ForumAge*.

Table 2 and Table 3 presents the descriptive statistics of these variables and the correlation among them.

	N	Mean	Median	S.D
<i>NumResponses</i>	1311395	7.84	2	61.59
<i>ForumAge</i>	1311395	2.58	2.1	2.23
<i>TitleLen</i>	1311395	44.07	42	18.94
<i>ContentLen</i>	1311395	921.27	255	2205.49
<i>DummySeek</i>	1311395	0.21	0	0.40
<i>DummyShare</i>	1311395	0.06	0	0.25
<i>DummyInst</i>	1311395	0.24	0	0.43
<i>InstPro</i>	1311395	28.13	1	85.77
<i>InfoPro</i>	1311395	2.35	0	40.33

Note: *ForumAge* is measured by years

Table 2. Descriptive Statistics

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1. <i>NumResponses</i>								
2. <i>ForumAge</i>	0.005							

3. TitleLen	0.037	0.068						
4. ContentLen	-0.007	-0.033	-0.005					
5. DummySeek	-0.017	0.029	-0.011	-0.142				
6. DummyShare	0.025	0.018	0.04	0.502	-0.113			
7. DummyInst	0.038	-0.034	0.098	-0.189	-0.228	-0.146		
8. InstPro	0.023	-0.028	0.059	-0.085	-0.088	-0.052	0.321	
9. InfoPro	0.149	0.008	0.028	0.046	-0.01	0.085	-0.021	0.019

Table 3. Correlation of Variables

Modeling

As shown above, the dependent variable is count data constituted of non-negative integers, and its standard deviation is much larger than its mean. This indicates that negative binomial model is more suitable. Besides, as threads posted by the same individual could be correlated, it is important to control the individual heterogeneity. Hence, we adopt xtnbreg procedure provided by STATA to examine the effect of a thread author's prior activity on the responses the thread receives. The procedure model the probability of count with the following equation with $\lambda_{it} = e^{X_{it}\beta}$.

$$\Pr(y_{it}|X_{it}, \delta_i) = \frac{\Gamma(\lambda_{it} + y_{it})}{\Gamma(\lambda_{it})\Gamma(y_{it} + 1)} \left(\frac{1}{1 + \delta_i}\right)^{\lambda_{it}} \left(\frac{\delta_i}{1 + \delta_i}\right)^{y_{it}}$$

y_{it} refers to the responses thread t of individual i receives. X_{it} refers to the explanatory variables and control variables observed for individual i 's thread t . δ_i represents the dispersion parameter for individual I . In sum, the procedure fits conditional fixed-effects overdispersion models, and assures that the dispersion is constant across threads posted by the same individual.

Results

As the explanatory variables are highly skewed, we take natural logarithmic transformation of *InfoPro* and *InstPro*. Hence, $\ln(\text{InfoPro})$ and $\ln(\text{InstPro})$ are used to estimate the models. The xtnbreg procedure conducts estimation based on within-group variance. If an individual only post one thread in our sample or an individual's multiple threads all receive 0 response, their threads are automatically dropped. Eventually, the estimation is conducted based on 1,116,737 threads posted by 145,061 different individuals. The results are presented in Table 4.

Model 1 only includes control variables. The results reveal that the characteristics of thread content and the experience of the thread author are significantly associated with the responses received by the thread. Specifically, threads seeking informational resource are less likely to receive responses, while the threads seeking instrumental resource are more likely to receive responses.

Model 2 includes the informational resource and instrumental resource the thread author provides before posting the thread. The results reveal that prior provision of informational resource is positively associated with the responses received ($\beta=0.027$, $p<0.001$), which supports hypothesis 1. In contrast, prior provision of instrumental resource is negatively associated with the responses received ($\beta=-0.015$, $p<0.001$). Thus, hypothesis 2 is supported.

Table 4. Estimation Results					
	Model 1	Model 2	Model 3	Model 4	Model 5
<i>Intercept</i>	-0.656*** (0.013)	-0.632*** (0.013)	-0.642*** (0.013)	-0.599*** (0.013)	-0.612*** (0.013)
<i>ForumAge</i>	0.006*** (0.001)	0.006*** (0.001)	0.006*** (0.001)	0.005*** (0.001)	0.005*** (0.001)

<i>ln(TitleLen)</i>	0.073*** (0.003)	0.076*** (0.003)	0.075*** (0.003)	0.073*** (0.003)	0.073*** (0.003)
<i>ln(ContentLen)</i>	-0.071*** (0.001)	-0.075*** (0.001)	-0.074*** (0.001)	-0.075*** (0.001)	-0.075*** (0.001)
<i>DummyShare</i>	0.036*** (0.007)	0.035*** (0.007)	0.036*** (0.007)	0.026*** (0.007)	0.027*** (0.007)
<i>DummySeek</i>	-0.056*** (0.003)	-0.059*** (0.003)	-0.008 (0.005)	-0.057*** (0.003)	-0.022*** (0.005)
<i>DummyInst</i>	0.395*** (0.003)	0.409*** (0.003)	0.403*** (0.003)	0.334*** (0.005)	0.343*** (0.005)
<i>ln(InfoPro)</i>		0.027*** (0.002)	0.023*** (0.002)	0.054*** (0.002)	0.051*** (0.002)
<i>ln(InstPro)</i>		-0.015*** (0.001)	-0.009*** (0.001)	-0.038*** (0.001)	-0.031*** (0.001)
<i>DummySeek × ln(InfoPro)</i>			0.034*** (0.004)		0.014*** (0.004)
<i>DummySeek × ln(InstPro)</i>			-0.04*** (0.002)		-0.025*** (0.002)
<i>DummyInst × ln(InfoPro)</i>				-0.086*** (0.004)	-0.083*** (0.004)
<i>DummyInst × ln(InstPro)</i>				0.047*** (0.002)	0.041*** (0.002)
<i>Log likelihood</i>	-2280361	-2280170	-2279989	-2279678	-2279613

Note: *p<0.05; **p<0.01; ***p<0.001

Table 4. Estimation Results

In Model 3, we interact *DummySeek* with *ln(InfoPro)* and *ln(InstPro)* to examine whether the effect of providing informational and instrumental resource would vary in threads that seek informational resource. The results demonstrate that the positive association between prior provision of informational resource and the responses received is strengthened in threads that explicitly seek informational resource ($\beta=0.034$, $p<0.001$), which supports hypothesis 3a. Similarly, the negative association between prior provision of instrumental resource and the responses received is strengthened in threads that seek informational resource ($\beta=-0.04$, $p<0.001$), which supports hypothesis 3b. The results are shown in Figure 2.

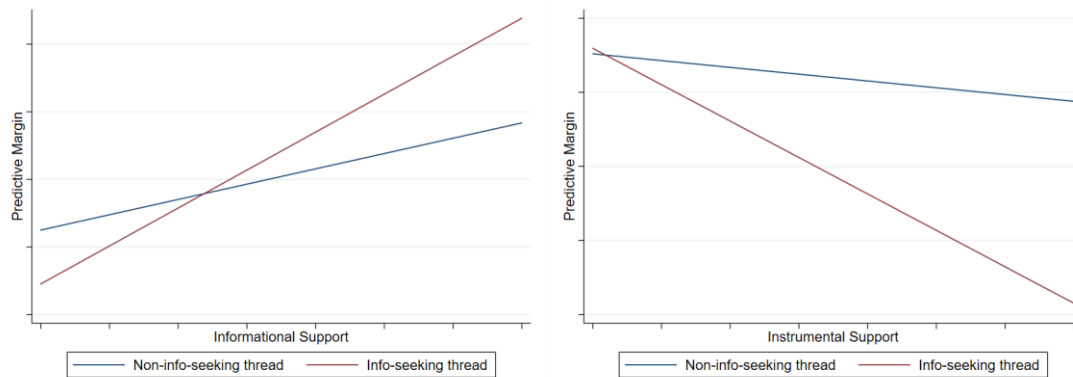


Figure 2. Moderating Effect of Threads Seeking Informational Resource

We then interact *DummyInst* with $\ln(\text{InfoPro})$ and $\ln(\text{InstPro})$ in Model 4 to examine whether the effect of providing informational resource and instrumental resource is different in threads seeking instrumental resource. The results also support hypothesis 4a and hypothesis 4b. In threads seeking instrumental resource, the positive association between the provision of informational resource and the received responses becomes less positive ($\beta=-0.086$, $p<0.001$), and the negative association between provision of instrumental resource and the received responses is less negative ($\beta=0.047$, $p<0.001$). The results are shown in Figure 3.

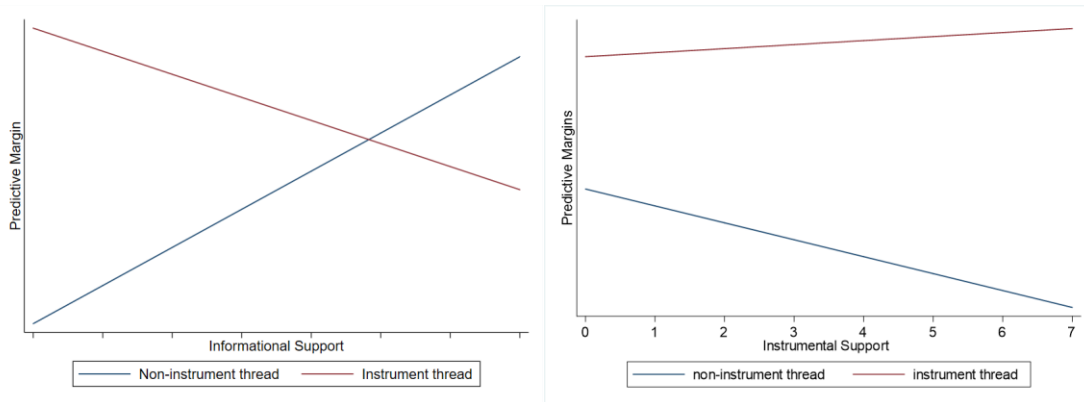


Figure 3. Moderating Effect of Threads Seeking Instrumental Resource

To further validate the findings and reduce the potential bias caused by the different baseline effect of model 3 and model 4, we include all four interactions in Model 5. The results are still consistent.

Robustness Check

To ensure the findings are not driven by the way we construct our variables or other potential alternative explanation, we conduct a series of robustness tests, which are explained below. Due to the page limit, the detailed results of these robustness tests are omitted.

Reconstructing dependent variable based on number of responders

In online forum, a thread could receive multiple responses from the same responder. Thus, the responses a thread receives could be driven by a few active and talkative responders. As these multiple responses from the same individual sometimes bring redundant resources, our dependent variable, the number of responses, may not accurately reflect the support the thread author receives. Hence, we also try to use the number of different responders a thread attracts as dependent variable. The results are consistent.

Reconstructing explanatory variables based on number of interactions

Our original explanatory variables are constructed based on the number of people a thread author has provided certain types of resources to. Hence, multiple interactions between the same pair of sellers are aggregated. Since other sellers might be impressed by the number of times a thread author provides resources rather than number of people the author provides resource to, we reconstruct the explanatory variables based on the number of times the thread author provides a certain type of resources. The results are consistent with our findings.

Different time window to generate activities and responses.

As explained above, we track a seller's prior activity and the responses of a thread based on a time window of 30 days. To examine whether our findings are sensitive to the time window we choose, we further calculate the number of responses (*NumResponses*) and the prior provision of informational resource (*InfoPro*) and instrumental resource (*InstPro*) based on a time window of 90 days. In other word, new *NumResponses* captures responses received by a thread in 90 days, while new *InfoPro* and *InstPro* reflect a seller's activity in 90 days before posting the thread. We conduct the analysis with these new variables. The results are consistent with our findings.

Controlling seasonal effect

In the online forum, the general activeness may differ in different months, because the sellers could be very busy in certain time periods or seasons. As a result, it could be more difficult for sellers to receive responses in certain months due to the low activeness across the whole community. We try to control the seasonal effect by adding a set of dummy variables to represent different months. Specifically, 10 dummy variables are added to represent Feb to Nov, while Dec will be the reference group. The results are consistent with our main analysis.

Additional Analysis

To further validate whether the effect of the prior contribution of informational resource and instrumental resource varies in threads seeking different resources, we conduct subgroup analysis. The results are reported in Table 5.

Table 5. Estimation Results for Subgroup Analysis				
	Model 1 DummySeek=1	Model 2 DummySeek=0	Model 3 DummyInst=1	Model 4 DummyInst=0
N	179066	874340	265268	806312
<i>Intercept</i>	-0.791*** (0.033)	-0.625*** (0.015)	-0.247*** (0.025)	-0.615*** (0.016)
<i>ForumAge</i>	-0.003 (0.002)	0.008*** (0.001)	0.01*** (0.002)	0.004*** (0.001)
<i>ln(TitleLen)</i>	0.027*** (0.008)	0.087*** (0.003)	0.102*** (0.006)	0.053*** (0.004)
<i>ln(ContentLen)</i>	0.0013** (0.004)	-0.088*** (0.002)	-0.09*** (0.003)	-0.055*** (0.002)
<i>DummyShare</i>	-0.075* (0.035)	0.069*** (0.007)	-0.159+ (0.086)	0.024*** (0.007)
<i>DummySeek</i>			-0.184*** (0.012)	-0.034** (0.003)
<i>DummyInst</i>	0.238*** (0.013)	0.403*** (0.003)		
<i>ln(InfoPro)</i>	0.049*** (0.005)	0.023*** (0.002)	-0.003 (0.004)	0.024*** (0.002)
<i>ln(InstPro)</i>	-0.029*** (0.003)	-0.011*** (0.001)	-0.01*** (0.001)	-0.016*** (0.001)

Note: *p<0.05; **p<0.01; ***p<0.001

Table 5. Estimation Results for Subgroup Analysis

Firstly, we divide the whole sample into information seeking group (*DummySeek=1*) and non-information seeking group (*DummySeek=0*). Estimations are then conducted with these 2 subsamples respectively. The results are shown in Model 1 and Model 2. In both subgroups, the provision of informational resource is positively associated with the number of responses, while the provision of instrumental resource is negatively associated with the responses. However, the results of the two subgroups differ in their effect size. For the provision of informational resource, the 95% confidence interval of its estimated coefficient is [0.039, 0.059] in information seeking group, while the 95% confidence interval of its estimated coefficient is [0.019, 0.027] in the non-information seeking group. Hence, the association between the provided informational resource and the received responses is more positive in threads seeking informational resource. For the provision of instrumental resource, the 95% confidence interval of its estimated coefficient is [-0.035, -0.024] in the information-seeking group, while the 95% confidence interval of its

estimated coefficient is [-0.013, -0.009] in the non-information seeking group. Hence, the association between the provided instrumental resource and the received responses is more negative in threads seeking informational resource. The results are consistent with hypothesis 3a and 3b.

Similarly, we also divide the whole sample into instrumental group (*DummyInst=1*) and non-instrumental group (*DummyInst=0*). Estimation results are shown in Model 3 and Model 4. The effect of providing informational resource on responses is insignificant for threads that seek instrumental resource (Model 3, $\beta=-0.002$, $p>0.1$), but the effect is significant and positive in non-instrumental group (Model 4, $\beta=0.024$, $p<0.001$). Hence, the association between the provided informational resource and the received responses is less positive in threads seeking instrumental resource. Moreover, the effect of providing instrumental resource on responses is negative and significant in both instrumental group and non-instrumental group, but it differs in the effect size. The 95% confidence interval of the estimated coefficient is [-0.012, -0.007] in instrumental group becomes [-0.018, -0.013] in non-instrumental group. Hence, the association between the provided instrumental resource and the received responses is less negative in threads seeking instrumental resource. The results are generally consistent with hypothesis 4a and 4b.

Conclusion and Discussion

Based on a context of online sellers' community, the present study demonstrates that sellers' provision of different types of resources affects the likelihood of receiving responses in different ways. Specifically, the provision of informational resource increases the likelihood of receiving responses. This indicates that other people may perceive a positive and kind intention from a seller's informational contribution, which could in turn trigger the reciprocal behaviors from others. In contrast, the provision of instrumental resource decreases the likelihood of receiving responses, indicating that others in the community may perceive a relatively unfavorable intention from a seller's behaviors of providing instrumental resource. Such perceived intention inhibits others to reciprocate the seller, resulting in less responses.

In addition, our findings also show that the effect of one's prior activity could vary across threads with different content. For threads explicitly seeking information, the positive effect of providing informational resource becomes more positive, and the negative effect of providing instrumental resource becomes more negative. In contrast, the positive effect of providing informational resource is undermined in threads seeking instrumental resource, while the negative effect of providing instrumental resource is less negative for threads seeking instrumental resource. The findings reveal that one's prior activity does not always trigger the same extent of reciprocity from others. The effect also depends on the alignment or misalignment between the content of a thread and the activity of the thread author.

Implication for research

Our study contributes to our knowledge of online community and social exchange in two ways. First, the study enhances our understanding of reciprocity in online context by differentiating the types of resource one could contribute. Prior literature typically focuses on knowledge contribution in online community and demonstrates that making contribution can trigger indirect reciprocation from others (Arguello et al. 2006; Wu and Korfiatis 2013). Our study shows more nuanced finding, which reveals that contribution by itself does not necessarily lead to positive reciprocity. Instead, different contribution could trigger different reciprocity. While contributing information and knowledge may indeed increase the responses one could receive, providing instrumental resource shows an opposite effect. Future research on online reciprocity may benefit from a better specificity about content exchanged through online interactions.

Second, our study contributes to the social exchange literature by differentiating the long-term relationship of exchange from the current transaction of exchange and investigating the alignment between them. Prior literature proposes that the current transactions or exchanges an individual is engaging in may not necessarily match with the relationships the individual builds with the exchange parties (Cropanzano and Mitchell 2005). Our study examines the impact of this potential mismatch by associating the types of resources in exchange with different forms of exchange. Specifically, instrumental resource is exchanged in a negotiated form, while informational resource is exchanged in a generalized form. Consequently, one's prior contribution of certain types of resource affects the types of exchange relationships s/he builds. The resource sought by a thread specifies the form of exchange for the current

transaction. The findings of our study reveal that the mismatch between exchange relationship and the current transaction indeed impede the obtainment of others' support. For instance, sellers who actively engage in exchange instrumental resource may less likely to receive informational resource from others.

Implication for practice.

Our findings also provide guidance to practitioners on how to participate in online community. Specifically, our findings provide guidance on how an individual should participate in the online community could affect the responses s/he receives. As the strength of the effect varies depending on the types of resource the individual is seeking, they need to ensure that the contribution they made matches with the resource they desire. If an individual wants to obtain information and knowledge from others, s/he should try to be active in providing informational resource and avoid engaging in exchanging instrumental resource. If an individual wants to obtain instrumental resource, s/he may not need to contribute informational resource.

For organizations who operate online communities, our study could help them improve the design of their communities. Specifically, our findings reveal that the engagement in exchanging instrumental resource has a negative impact on the responses one could receive, and such impact is more salient when the focal individual is seeking information. This indicates that the negotiated exchange of instrumental resource might impede the generalized exchange of informational resource. Given that the form of generalized exchange is important to the sustainability and solidarity of the community (Faraj and Johnson 2011; Molm et al. 2007), organizations should carefully balance the amount of instrumental resource and informational resource exchanged in the community. For instance, organizations could develop separate sub-forums for different types of communication, so that the exchange of instrumental resource in one sub-forum may have less impact on the exchanges of informational resource in another sub-forum.

Reference

- Arguello, J., Butler, B. S., Joyce, E., Kraut, R., Ling, K. S., Rosé, C., and Wang, X. 2006. "Talk to Me: Foundations for Successful Individual-Group Interactions in Online Communities," *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems*: ACM, pp. 959-968.
- Barrera, M. 1986. "Distinctions between Social Support Concepts, Measures, and Models," *American Journal of Community Psychology* (14:4), pp. 413-445.
- Bickart, B., and Schindler, R. M. 2001. "Internet Forums as Influential Sources of Consumer Information," *Journal of Interactive Marketing* (15:3), pp. 31-40.
- Blau, P. M. 1964. *Exchange and Power in Social Life*. Transaction Publishers.
- Cook, K. S., Cheshire, C., Rice, E. R., and Nakagawa, S. 2013. "Social Exchange Theory," in *Handbook of Social Psychology*. Springer, pp. 61-88.
- Coulson, N. S. 2005. "Receiving Social Support Online: An Analysis of a Computer-Mediated Support Group for Individuals Living with Irritable Bowel Syndrome," *CyberPsychology & Behavior* (8:6), pp. 580-584.
- Cox, J. C., Friedman, D., and Gjerstad, S. 2007. "A Tractable Model of Reciprocity and Fairness," *Games and Economic Behavior* (59:1), pp. 17-45.
- Cropanzano, R., and Mitchell, M. S. 2005. "Social Exchange Theory: An Interdisciplinary Review," *Journal of Management* (31:6), pp. 874-900.
- Dahlander, L., and O'Mahony, S. 2011. "Progressing to the Center: Coordinating Project Work," *Organization Science* (22:4), pp. 961-979.
- Deci, E. L., and Ryan, R. M. 1975. *Intrinsic Motivation*. Wiley Online Library.
- Ekeh, P. P. 1974. *Social Exchange Theory: The Two Traditions*. Cambridge, MA: Harvard University Press.
- Falk, A., and Fischbacher, U. 2006. "A Theory of Reciprocity," *Games and Economic Behavior* (54:2), pp. 293-315.
- Faraj, S., and Johnson, S. L. 2011. "Network Exchange Patterns in Online Communities," *Organization Science* (22:6), pp. 1464-1480.
- Faraj, S., Kudaravalli, S., and Wasko, M. 2015. "Leading Collaboration in Online Communities," *MIS Quarterly* (39:2), pp. 393-412.

- Flynn, F. J. 2005. "Identity Orientations and Forms of Social Exchange in Organizations," *Academy of Management Review* (30:4), pp. 737-750.
- Foa, E. B., and Foa, U. G. 1980. "Resource Theory," in *Social Exchange*. Springer, pp. 77-94.
- Gouldner, A. W. 1960. "The Norm of Reciprocity: A Preliminary Statement," *American Sociological Review*, pp. 161-178.
- Gu, B., Huang, Y., Duan, W., and Whinston, A. B. 2008. "Indirect Reciprocity in Contributions to a Peer-to-Peer Music Sharing Network-an Empirical Analysis of Individual Level Data," *ICIS 2008 Proceedings*, p. 158.
- Johnson, S. L., Safadi, H., and Faraj, S. 2015. "The Emergence of Online Community Leadership," *Information Systems Research* (26:1), pp. 165-187.
- Joyce, E., and Kraut, R. E. 2006. "Predicting Continued Participation in Newsgroups," *Journal of Computer-Mediated Communication* (11:3), pp. 723-747.
- Jurka, T. P., Collingwood, L., Boydston, A., Grossman, E., and van Atteveldt, W. 2012. "Rtexttools: Automatic Text Classification Via Supervised Learning." R package version 1.3.9.
- Jurka, T. P., Collingwood, L., Boydston, A. E., Grossman, E., and van Atteveldt, W. 2013. "Rtexttools: A Supervised Learning Package for Text Classification," *The R Journal* (5:1), pp. 6-12.
- LaCoursiere, S. P. 2001. "A Theory of Online Social Support," *Advances in Nursing Science* (24:1), pp. 60-77.
- Lampel, J., and Bhalla, A. 2007. "The Role of Status Seeking in Online Communities: Giving the Gift of Experience," *Journal of Computer-Mediated Communication* (12:2), pp. 434-455.
- Langford, C. P. H., Bowsher, J., Maloney, J. P., and Lillis, P. P. 1997. "Social Support: A Conceptual Analysis," *Journal of Advanced Nursing* (25:1), pp. 95-100.
- Molm, L. D. 2010. "The Structure of Reciprocity," *Social Psychology Quarterly* (73:2), pp. 119-131.
- Molm, L. D., Collett, J. L., and Schaefer, D. R. 2007. "Building Solidarity through Generalized Exchange: A Theory of Reciprocity," *American Journal of Sociology* (113:1), pp. 205-242.
- Molm, L. D., Schaefer, D. R., and Collett, J. L. 2009. "Fragile and Resilient Trust: Risk and Uncertainty in Negotiated and Reciprocal Exchange," *Sociological Theory* (27:1), pp. 1-32.
- Monge, P. R., and Contractor, N. S. 2003. *Theories of Communication Networks*. Oxford University Press, USA.
- Moon, J. Y., and Sproull, L. S. 2008. "The Role of Feedback in Managing the Internet-Based Volunteer Work Force," *Information Systems Research* (19:4), pp. 494-515.
- Peddibhotla, N. B., and Subramani, M. R. 2007. "Contributing to Public Document Repositories: A Critical Mass Theory Perspective," *Organization Studies* (28:3), pp. 327-346.
- Serenko, A., and Bontis, N. 2016. "Negotiate, Reciprocate, or Cooperate? The Impact of Exchange Modes on Inter-Employee Knowledge Sharing," *Journal of Knowledge Management* (20:4), pp. 687-712.
- Stanca, L. 2010. "How to Be Kind? Outcomes Versus Intentions as Determinants of Fairness," *Economics Letters* (106:1), pp. 19-21.
- Uehara, E. 1990. "Dual Exchange Theory, Social Networks, and Informal Social Support," *American Journal of Sociology* (96:3), pp. 521-557.
- Wang, X., Zhao, K., and Street, N. 2014. "Social Support and User Engagement in Online Health Communities," in *Smart Health*. Springer, pp. 97-110.
- Wang, Y., Wang, S., Fang, Y., and Chau, P. Y. 2013. "Store Survival in Online Marketplace: An Empirical Investigation," *Decision Support Systems* (56), pp. 482-493.
- Wasko, M. M., and Faraj, S. 2005. "Why Should I Share? Examining Social Capital and Knowledge Contribution in Electronic Networks of Practice," *MIS Quarterly* (29:1), pp. 35-57.
- Wasko, M. M., Teigland, R., and Faraj, S. 2009. "The Provision of Online Public Goods: Examining Social Structure in an Electronic Network of Practice," *Decision Support Systems* (47:3), pp. 254-265.
- Wu, P. F., and Korfiatis, N. 2013. "You Scratch Someone's Back and We'll Scratch Yours: Collective Reciprocity in Social Q&a Communities," *Journal of the American Society for Information Science and Technology* (64:10), pp. 2069-2077.
- Yan, L., and Tan, Y. 2014. "Feeling Blue? Go Online: An Empirical Study of Social Support among Patients," *Information Systems Research* (25:4), pp. 690-709.