Social exchange in online social networks. The reciprocity phenomenon on Facebook

Jerzy Surma*

Institute of Informatics and Digital Economy, Warsaw School of Economics, Aleja Niepodleglosci 162, 02-554 Warsaw, Poland

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ABSTRACT

Social exchange theory proposes that social behavior is the result of an exchange process. The purpose of this exchange is to maximize benefits and minimize costs. Online social networks seem to be an ideal platform for social exchange because they provide an opportunity to keep social relations with a relatively low cost compared to offline relations. This theory was verified positively many times for offline social interactions, and we decided to examine whether this theory may be also applied to online social networks. Our research is focused on reciprocity, which is crucial for social exchanges because humans keep score, assign meaning to exchanges, and change their subsequent interactions based on a reciprocity balance. The online social network platform of our choice was Facebook, which is one of the most successful online social sites allowing users to interact with their friends and acquaintances. In our study we found strong empirical evidence that an increase in the number of reciprocity messages the actor broadcasts in online social networks increases the reciprocity reactions from his or her audience. This finding allowed for positive verification of the social exchange theory in online communities. Hence, it can be stated that our work contributes to theories of exchange patterns in online social networks.

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1. Introduction

The focus of this paper is on dyadic exchange in online social networks, based on the social exchange theory. One of the core concepts of network exchange theories [29,33] is the primacy of reciprocation. According to this theory, reciprocity is a behavioral response to perceived kindness and unkindness, where kindness comprises both distributional fairness as well as fairness intentions. There is a large body of evidence which indicates that reciprocity is a powerful determinant of human behavior. Experiments and questionnaire studies performed by psychologists and economists, as well as an impressive literature in sociology, ethnology and anthropology, emphasize the omnipresence of reciprocal behavior (see, e.g., [19,27]). In our study, we apply the core concepts of organizational network research [29] to investigate interaction dynamics of long-duration online social networks. Kilduff et al. define a core of key idea that we adopt in this research: the primacy of relationships. We theorize and empirically measure the communication patterns of online social networks using Facebook as a platform for our research.

This paper is organized as follows: in the subsequent section we present related works. Section 3 introduces theory description and research hypothesis. Section 4 contains the experimental part,

including research settings and the description of variables. Section 5 discusses the regression models and final results. Section 6 concludes and discusses our experimental findings, ending with a short overview of the potential applications.

2. Related work

Becker [3] asserts that a fundamental virtue represents a trait that is necessary for a rational agent, one who is capable of reasoned choices, to have to achieve excellence in moral behavior. Reciprocity is an avenue to a number of these traits, known as "primary goods". A primary good is defined as "a state or object, or disposition that is necessary to the conduct of rational agents—that is, to deliberation and choice, or to goal satisfaction per se" [3]. In the sociological literature there is a strong empirical evidence in support of the existence of reciprocity as a norm applicable to all of society [4,13,21]. Its universality is predicated on the assumption that social life operates within a paradigm of exchange. Norms are expectations about behavior that are at least partially shared by a group of decision makers [22].

In the studies associated with the game theory, the reciprocity phenomenon was under close investigation. Falk and Fischbacher [15] present a formal theory of reciprocity, which takes into account that people evaluate the kindness of an action not only by its consequences but also by its underlying intention. The theory is in line with the relevant stylized facts of a wide range of experimental games. Dufwenberg and Kirchsteiger [12] developed a theory of reciprocity

* Corresponding author. Tel.: +48 (22) 564 60 00.
  E-mail address: jerzy.surma@sgh.waw.pl

for extensive games in which the sequential structure of a strategic situation is made explicit, and proposed a new solution concept which is sequential reciprocity equilibrium. Wang et al. [37] study the outcome of the public goods game on two interdependent networks that are connected by means of a utility function, which determines how payoffs on both networks jointly influence the success of players in each individual network. They show that an unbiased coupling allows the spontaneous emergence of interdependent network reciprocity, which is capable to maintain healthy levels of public cooperation even in extremely adverse conditions. The comprehensive review of management and economical research on reciprocity is presented in [20].

Currently, there is a significant stream of research based on social networks and online social networks. Rice [35] also found support for direct reciprocity in a study of 24 months of computer conference system use among 10 groups involving over 87,000 total network links. The problem of reciprocity prediction was studied by Cheng et al. [9]. They extract a network based on directed @-messages sent between users on Twitter, and they find that differences in reciprocity can be related to the notion of status. People with similar status often participate in reciprocated interactions (e.g. messages between friends), while those with disparate status often participate in unreciprocated interactions (e.g. messages from fans to celebrities). Leider et al. [31] conducted online field experiments in large real-world social networks in order to investigate altruism and reciprocity behavior. The experimental findings suggest that future interaction affects giving through a repeated game mechanism where agents can be rewarded for granting efficiency-enhancing favors. They also found that subjects with higher baseline altruism have friends with higher baseline altruism. Online social network participation is a social phenomenon, and as in any endeavor governed by human behavioral patterns, we expect participants in online communities to exhibit nonrandom, intentional communication choices. Previous research has found that individuals share their knowledge in online communities because they want to interact with others and exchange knowledge [28,39]. Their actions are influenced by both utilitarian and social influence motivations [24]. A number of individual factors leading to increased participation have been identified: functional role [1], self-interest [23], boundary-spanning roles [18], trust [25], reputation [10], and finally reciprocity ([8,16]), which is related to our research. Chao-Min et al. [8] research holds the facets of the social capital theory like social ties, trust, reciprocity, and identification will influence individuals' knowledge sharing in virtual communities. On other hand Faraj and Johnson [16] research is based on social exchange theory. They discovered that exchange patterns in online community communication networks are characterized by direct and indirect reciprocity patterns.

The reciprocity oriented research has emerged recently on Facebook. In the survey based study Jung et al. [26] were trying to capture relation between participants' propensity to perform signals of relational investment and number of responses to a favor request. Ellison et al. [14] study explores the relationship between perceived bridging social capital and specific Facebook-enabled communication behaviors. According to this study bridging social capital individuals must engage in intentional behaviors that signal attention to components of their network and contribute to expectations of reciprocity.

3. Theory

Social exchange theory proposes that social behavior is the result of an exchange process [21]. The purpose of this exchange is to maximize benefits and minimize costs. According to this theory, people weigh the potential benefits and risks of social relationships. When the risks outweigh the rewards, people will terminate or abandon that relationship. In economics it means minimizing transactions costs and thereby increases adaptability and economic stability [4].

People develop patterns of exchange to cope with power differentials and to deal with the costs associated with exercising power [42]. One of the crucial patterns is reciprocity [17]. The process begins when at least one participant makes a "move," and if the other reciprocates, new rounds of exchange initiate. Once the process is in motion, each consequence can create a self-reinforcing cycle [7]. Reciprocity is crucial for all exchanges because humans keep score, assign meaning to exchanges, and change their subsequent interactions based on a reciprocity balance [13].

Online social networks provide forums for information exchange in open communication networks. Social exchange theory grew out of attempts to formalize the study of interpersonal relations and "social processes such as power and the exercise of influence" (Cook and Rice [11]). A key development in social exchange theory was the incorporation of a network perspective with the view that exchange relations form network structures (Cook and Rice [11]). In order to support development of a general "structural theory of power and dependence in networks" [6], network exchange theory complements social exchange theory through formal investigation of individual and group behaviors in networks. According to Faraj and Johnson [16] online communities are built on the dual aspect of online interactions: they are social exchanges that take place between participants but they occur within a network context. With a focus primarily on individual position in the network and availability of alternative ties among actors, network exchange theorists have used this approach to study the status and relative power of individuals in a network [32,38,40].

In online social networks, social exchange is based on written and graphical communication between users. Before we relate our hypothesis directly to the reciprocity we should understand the interactions between users. It seems to be obvious that reactions from audience should be positively related to the strength of the actor broadcasting activity. According to Amichai-Hamburger and Vinitzky [2] most online social networks users were happy to put on public exhibition a broad range of photos, including those sent to them by others, mostly of themselves in the context of their friends and mostly showing happiness and enjoyment. In an experimental study Tong et al. [36] examined the relationship between the number of friends a Facebook profile featured and observers' ratings of attractiveness and extraversion. A curvilinear effect of popularity and social attractiveness emerged, as did a quartic relationship between friend count and perceived extraversion. Thus, we suggest the following hypothesis:

Hypothesis 1. *An increase in the number of messages the actor broadcasts increases the reactions from his or her audience.*

According to social exchange theory the relationship described by the first hypothesis should be the same and even stronger if there exists a self-reinforcing cycle based on the phenomenon of reciprocity between online social network members. In this context actors are able to easily gain benefits from online relations (for instance to strength friendship), keeping a relatively low cost of online communication. We therefore propose:

Hypothesis 2. *An increase in the number of reciprocity messages the actor broadcasts increases the reciprocity reactions from his or her audience.*

The second hypothesis is referring directly to the research on direct reciprocity in on-line communities [16]. Our study is not only confirming their discovery but showing that concept of the reciprocity-based interactions is much broader. Facebook social network is based basically on the friendship relationship, so rational for reciprocity is social-based, meaning that people mainly would like to create or enhance relationships [34]. In contrast software knowledge networks for professionals (very often anonymous for each other) are focusing on knowledge exchange. In this context our study shows