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RESEARCH ARTICLE

ON THE ROLE OF FAIRNESS AND SOCIAL DISTANCE IN DESIGNING EFFECTIVE SOCIAL REFERRAL SYSTEMS[1]

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Online referral systems help firms attract new customers and expand their customer base by leveraging the social relationships of existing customers. We integrate ultimatum game theory, which focuses on fairness, with motivation theories to investigate the effects of ***social distance*** *and* ***monetary incentives*** *on the performance of three competing designs for online referral systems: rewarding only or primarily the proposer, rewarding only or primarily the responder, and dividing the reward equally or fairly between the proposer and responder. A set of controlled laboratory and randomized field experiments were conducted to test how the fairness of the split of the reward (equal/fair versus unequal/unfair split of the referral bonus) and social distance (small versus large) between the proposer and the responder jointly affect the performance of online referral systems (the proposer sending an offer and the responder accepting the offer). For a large social distance (acquaintances or weak tie relationships), equally splitting the referral bonus results in the best performance. However, for a small social distance (friends or strong tie relationships), an equal split of the referral reward does not improve referral performance, which suggests that under a small social distance, monetary incentives may not work effectively. Face validity and external validity (generalizability) are ensured using two distinct measures of social distance across several contexts. Through the analysis of the interaction effects of fairness and social distance, our research offers theoretical and practical implications for social commerce by showing that the effectiveness of fairness on the success of online social referrals largely depends on social distance.*

Keywords: Online referral systems, referral performance, social distance, fairness, incentive design, ultimatum game, motivation

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The appendices for this paper are located in the "Online Supplements" section of the *MIS Quarterly*'s website (http://www.misq.org).

Introduction

The Internet has dramatically changed interpersonal communication (Lamb and Kling 2003). Specifically, online social networks may transcend traditional social relationships among people, partly because the Internet enables connections among acquaintances (e.g., Aral et al. 2013; Ganley and Lampe 2009). According to a recent survey,[2] the average Facebook user has 145 friends, but only 28% of them are considered close friends. Therefore, the Internet increases the number of "acquaintance-type" relationships. Accordingly, online referrals have been transformed by the Internet. While offline referrals usually take place among friends or family members, online referrals can be sent easily to acquaintances with a large social distance. Therefore, the Internet and online social communities have made referrals easier, faster, and more pervasive than ever before, both among close friends and acquaintances, thereby giving rise to "social commerce" (e.g., Liang and Turban 2011; Stephen and Toubia 2010).

The unique nature of communication in online social communities has attracted the attention of practitioners and firms that seek to encourage their existing customers to disseminate word of mouth (WOM) through their customers' social connections. As a vital measure of marketing success, new customer acquisition is crucial for firms, especially start-up firms with a limited marketing budget that mostly depend on customer-generated WOM communication. Conventional wisdom assumes that monetary incentives can attract customers, and firms are generally willing to incur substantial customer acquisition costs (e.g., referral fees). Therefore, online social referrals appear promising. Several firms, such as Groupon, try to recruit new customers by relying on the social relationships of their existing customers and only paying those proposers who have made successful referrals. Other firms,[3] such as Dropbox, use an equal-split bonus structure (250G/250G) for both sides of the referral; a similar approach was adopted by Scottrade. Social referrals have become a distinct business model; some startups, such as Extole, leverage their customers' online relationships to build social referral systems.[4] In sum, firms have started to leverage the social connections of their existing customers by using monetary incentives to expand their customer base (Dellarocas 2006).

Although online referral systems may be able to recruit new customers with monetary incentives, they may generate unnecessary expenditures if they are not designed and implemented properly. While monetary incentives are typically considered an effective approach to encourage referrals (Wirtz and Chew 2002), evidence from both practice[5] and research (Tuk 2009) reveals that the effectiveness of monetary incentives is bounded by many contingencies, notably social relationships. For example, it was shown that consumers are more likely to have a higher intention to recommend a product when they are offered a higher referral bonus, and this effect is moderated by the tie strength between the proposer and responder (Ryu and Feick 2007). Given that incentives and social dynamics are both core components of the IT artifact (e.g., Ba et al. 2001; Hevner et al. 2004), the design of online referral systems poses an important question for IS researchers. Accordingly, in this study, we examine two related aspects of online social referral systems: bonus split *fairness* and *social distance*.

In practice, referral bonuses are usually a certain amount budgeted as customer acquisition cost (such as $10) in various bonus splits, such as rewarding the proposer only (10, 0), rewarding the responder only (0, 10), or equally dividing the reward between the two parties (5, 5). Such variations of the bonus split not only indicates how much each party receives, but also allows us to empirically examine the important economic and social construct of "fairness" from an academic perspective. An equal split (5, 5) is essentially a fair split of the bonus. Laboratory experiments and the behavioral economics literature emphasize the importance of fairness in multiple contexts; for example, in the ultimatum game, people tend to favor fair splits (Güth et al. 1982). However, the role of fair bonus splits may be contingent on social relationship elements, notably *social distance*. Individuals within a small social distance (e.g., friends) may not care about the fairness of the referral bonus, whereas individuals with a large social distance (e.g., acquaintances) may care about the fairness of the bonus. Accordingly, monetary incentives may not always work effectively for social referrals. The social connections among people also provide a basis of online referral systems. Individuals adopt different behavioral rules across social relationships. Close friends typically get along with each other in a personal manner, whereas acquaintances often get along with one another professionally or socially. Social distance is a key characteristic of dyadic relationships that

[2]http://www.telegraph.co.uk/news/science/science-news/12108412/Facebook-users-have-155-friends-but-would-trust-just-four-in-a-crisis.html.

[3]In both examples (Dropbox and Scottrade), both sides of the referral (proposer and responder) know the bonus split structure, but other firms do not explicitly disclose the bonus split structure to both sides. In this study, we assume that bonus split structures are disclosed to both sides of the referral. However, the disclosure of the bonus reward is not within the scope of this study. We thank an anonymous reviewer for pointing out this issue.

[4]Appendix A lists the most commonly used referral bonus splitting practices in the industry.

[5]http://www.referralsaasquatch.com/referral-program-roundup-a-quick-profile-of-3-problems-with-referral-campaigns.

captures the distance among people (Karakayali 2009). A prevailing theoretical view of social distance focuses on *affectivity*, which centers on the feelings or emotions of individuals toward each other (Bogardus 1947). Accordingly, in this study, we conceptualize social distance as *affective distance*, or how much sympathy a person feels for another person in a relationship. We use the seminal Bogardus social distance scale (Bogardus 1947) to theorize and measure the affectivity of a social distance, operationalized as *small* social distance (friends or close relatives) versus *large* social distance (acquaintances or coworkers). Social distance can also be conceptualized based on the *frequency of interactions* among people, also known as interactive social distance or tie strength. Accordingly, to enhance generalizability, we replicate the findings from affective social distance (friends versus acquaintances in Experiments 1 and 2) to interactive social distance (frequent versus infrequent interactions in Experiment 3).

In summary, we seek to optimize the design of online social referral systems by examining the interaction effects of *monetary incentives* (fairness of the bonus split) and *social distance* (friends versus acquaintances) on social referral performance. Social distance is measured by two distinct measures, specifically, whether the proposer agrees to send a referral invitation (proposer acceptance), and whether the responder accepts the offer (responder acceptance). We also measure the success of a referral based on the mutual acceptance between the proposer and responder. Accordingly, we seek to address the following research questions:

- *What are the effects of social distance and fairness of the bonus split on the performance of online social referrals?*

- *How does social distance moderate the relative effect of the fairness of the bonus split on the performance of online social referrals?*

We build upon ultimatum game theory and motivation theory to conceptualize the direct and interaction effects of the fairness of the bonus split and social distance on the performance of the design of online referral systems. We propose that the effect of fairness on social referral performance is moderated by social distance. We conducted a set of laboratory randomized field experiments to test our hypotheses. The fairness of the bonus split was shown to enhance referral performance for a large social distance (acquaintances), but *not* for a small social distance (friends). The randomized field experiment showed that a fair split of the referral bonus does not increase referral performance for a small social distance. In contrast, within a large social distance, a fair split of the referral bonus results in better performance. Thus, monetary incentives may harm the performance of online social referral systems if they are incompatible with the intrinsic motivations of users. Finally, these results are validated in another lab experiment in which tie strength (frequency of interaction) is used as an alternative measure of (interactive) social distance.

Our paper makes two key contributions: First, we contribute to the emerging IS literature on online social commerce by integrating theories from economics and psychology to understand the effective design of an IT artifact (online referral system). Second, we extend the emerging literature on referral incentive design by showing that to enhance the performance of online referral systems, firms must not only consider the extrinsic motivations of their customers for monetary bonuses but must also integrate their intrinsic motivations when designing online referral systems. Specifically, we seek to bring the role of fairness of the referral bonus and social distance to the forefront. Third, we contribute to the ultimatum game theory and the notion of bounded rationality in individual decision-making by providing both laboratory and field evidence to support the socially sensitive role of fairness (i.e., fairness has a stronger effect among acquaintances than among friends).

The rest of the paper is structured as follows: First, we review the literature on social commerce and online referral systems. We then develop the proposed hypotheses, followed by a description of the research setting, design, methodology, and results. Finally, we present the contributions of the paper and the implications of our findings for theory and practice.

Literature Review

Online Social Communities

Online social communities are built on social relationships. The Internet has made offline social relationships traceable (Oinas-Kukkonen et al. 2010), while online social communities have also changed how people communicate with each other (Cheung and Lee 2010; Jasperson et al. 2002). Close friends, acquaintances, or strangers may share common interests in online social communities and exert a social influence on the behavior of others (Aral et al. 2013; Bapna and Umyarov 2015). Online social communities have attracted the attention of firms that seek to leverage social relationships to extend their customer base. For example, the connectedness of a social network structure affects the effectiveness of social marketing (Amblee and Bui 2011; Ganley and Lampe 2009).

Online social communities have rendered online WOM communication more convenient and extensive than traditional WOM communication (Dellarocas 2003; Zhu and Zhang 2010). Online WOM spreads rapidly through social communities and affects the purchase intentions of potential customers (Forman et al. 2008). Perceived product quality and pricing are also influenced by WOM communication (Hu et al. 2017; Li and Hitt 2010). The large number of people who actively participate in online social communities has created a large potential for online WOM communication; therefore, it is crucial for firms to enhance the effectiveness of online WOM (Duan et al. 2008; Mudambi and Schuff 2010). Viewing users in online social networks as social actors (Lamb and Kling 2003) and correctly incentivizing them can help harness the power of online social communities.

Monetary Incentives and the Fairness of Allocation

Online referral systems typically involve a certain bonus split (allocation of the monetary award) that brings the notion of fairness into the consideration sets of both the proposer and the responder. Psychology and behavioral economics scholars have investigated what people consider a fair allocation of monetary incentives, and the concept of equity has dominated the literature. The basic concept of equity specifies the inputs (or contributions) that people bring into a social relationship (which can be positive or negative) and the resulting outputs that people receive from a relationship (which may be positive or negative) (Adams 1965; Walster et al. 1973; Walster and Walster 1975).

Recent studies have proposed three popular allocation rules based on the relationships between inputs and outputs, namely, *equity*, *equality*, and *need* (Cohen 1986; Hochschild 1986), among which equity and equality are the most relevant. As a proportional contribution rule, *equity* mainly operates in competitive situations that emphasize individuality, with minimal interpersonal attraction among individuals, and aims for productivity (Deutsch 1975; Lerner 1977). As the equal outcomes rule, *equality* operates in situations with group solidarity, promotes a cooperative atmosphere, and collectively aims for harmony. Many studies on equity and distributive justice have attempted to prescribe the most appropriate or preferred principles in various social situations. The affectivity of a relationship affects the distribution rule preferences of individuals. Equality is generally preferred in situations with intimacy and affection (Greenberg 1983; Hochschild 1986), such as among friends, whereas equity is preferred in situations that emphasize productivity (Stake 1983), such as among acquaintances. Past studies suggest that friends tend to use an equality rule, while acquaintances tend to favor an equity rule (e.g., Austin 1980; Benton 1971; Morgan and Sawyer 1967). However, only few studies have investigated how the quantitative dimensions of relationships affect equity rule. Mikula (1980) suggested that people in long-term social relationships tend to prefer an equality rule, whereas those in short-term or temporary relationships prefer an equity rule.

Online Referral Systems

Online referral systems are important mechanisms that rely on monetary incentives while seeking to leverage the positive WOM of existing customers to attract new ones. Referral systems dominate advertising when the firm has a sufficient market penetration or when the proposer shows a reasonably high referral performance (Xiao et al. 2011). The advantage of monetary incentives lies in selecting only positive WOM. By contrast, in the case of online reviews, people may also post negative reviews that may be detrimental in acquiring new customers (Dellarocas and Wood 2008; Li and Hitt 2008). Instead of merely gathering opinions, social referral systems foster such opinions by establishing a system for managing social interactions (Awad and Ragowsky 2008; Hennig-Thurau and Walsh 2003; Li and Du 2011). Referrals traditionally take place among friends and relatives offline. However, online social communities have created a communication platform among friends, acquaintances, and even, albeit rarely, strangers. The convenient communication channels available on the Internet make online social referrals possible among people who are connected within different social distances.

Experimental work on referral systems has focused on the responses of a proposer to the incentives of a referral. Several pioneering studies have investigated referral incentive designs and their effects. Previous studies on referral systems provide substantial guidance on when rewards should be offered (Biyalogorsky et al. 2001) by quantifying the influence of rewards and tie strength (frequency of interactions between two individuals) on the likelihood of a proposer to make referrals (e.g., Ryu and Feick 2007; Wirtz and Chew 2002). Most studies showed that monetary incentives can effectively increase such likelihood (e.g., Wirtz and Chew 2002). Ryu and Feick (2007) examined the influence of tie strength, brand strength, and reward structure on the likelihood for a proposer to make referrals and found that monetary incentives can effectively enhance referral likelihood. By contrast, Tuk (2009) found that the monetary incentives of a proposer may reduce the likelihood for the responder to purchase the recommended product because the reward can be ill-perceived by the responder, thereby reducing the perceived sincerity of the proposer. In this study, aiming to extend the literature that mostly focuses on *offline* referrals in a lab setting, we focus on *online social* referrals with both laboratory and field experiments. Further, while most studies focus on the behavior of the proposer (e.g., Ryu and Feick 2007; Wirtz and Chew 2002), we use an ultimatum game setting and examine the behaviors of both the proposer and the responder, and also the mutual acceptance of the referral. Finally, extant studies (e.g., Wirtz and Chew 2002) focused on the absolute amount of the referral bonus; our study instead focuses on the bonus split fairness.

Social referral systems are different from recommender systems. Xiao and Benbasat (2007) involves the proposer actively pushing the recommended products or services to the individuals within his/her network. Wang and Benbasat (2008) involves the system offering machine-generated recommendations to individuals. Social referral systems usually involve a monetary incentive and social relationships between the proposer and receiver, whereas recommender systems focus on the underlying algorithm (Adomavicius and Tuzhilin 2005), trust in the system (Benbasat and Wang 2005), transparency (Xu et al. 2014), and other factors that drive their adoption. The online referral systems investigated in this paper are developed on a peer-to-peer basis (a common business model adopted by most referral companies), which is different from broadcasting information within a social network (e.g., posting product information on Twitter or Facebook).

Summarizing these studies, a key gap in the literature points to whether different designs of the monetary incentives (e.g., fairness of the bonus split) have different effects on the performance of online referral systems for various types of dyadic proposer–responder relationships with different social distances (e.g., friends versus acquaintances or frequent/infrequent interactions). To extend this literature, we consider the joint (interaction) effect of the split of the referral bonus and the social distance between the proposer and responder on the performance of online referral systems.

Hypotheses Development

To understand the effectiveness of online referral systems, we study the behaviors of both the proposer and the responder. Accordingly, we mainly consider two measures of referral success: (1) whether the proposer agrees to send a referral (*proposer acceptance*) and (2) whether the responder accepts the referral and makes a purchase, conditional on the proposer sending the referral (*responder acceptance*). We also consider the mutual acceptance of the referral, termed as *proposer acceptance* × *responder acceptance*.

To examine the behaviors of the proposer and the responder, it is important to understand the motivations behind the expected behaviors. Intrinsic motivation is driven by interest or enjoyment in the task itself rather than by external pressures or desire for a reward (e.g., Wigfield et al. 2004). Extrinsic motivation refers to the performance of an activity toward a reward (e.g., Lepper et al. 1973). These motivations can be applied in the context of social referrals as the motivation of the proposer for sending referrals, and how such referrals are being perceived by the responder, that is, referral due to intrinsic motivation versus referral due to extrinsic motivation (monetary incentive). The referral is expected to be attributed to intrinsic motivation when both parties have a small social distance (i.e., goodwill among close friends; Rempel et al. 1985). In contrast, the referral is proposed to be attributed to extrinsic motivation when a monetary incentive is involved when the two parties have a large social distance (i.e., acquaintances). Accordingly, we herein examine the *social distance* between two entities (e.g., friends versus acquaintances) and the *fairness* of splitting a bonus (monetary incentive) on *referral performance* (proposer and responder acceptance). Table 1 defines the key constructs.

Effect of Social Distance on Referral Performance

Dyadic interpersonal social relationships involve certain affectivity. According to this approach, social distance may be related to affective distance or how much sympathy a person feels for another within a social relationship (Bogardus 1947). Social distance can also be conceptualized by interactive distance (tie strength). These conceptualizations are highly related. Social distance focuses on the very nature of the relationship, whereas tie strength focuses on the frequency of interactions (Karakayali 2009). Frequent interactions typically foster affectivity among individuals. We use *affective* social distance as the primary measure (Experiments 1 and 2), and then replicate and validate the generalizability of the findings to *interactive* social distance (Experiment 3).

Two individuals within a small social distance share many similar experiences, have many topics to talk about, and know each other very well (Johar 2005); therefore, they understand each other's needs. With many common interests and having a mutual understanding of each other's needs, the proposer tends to care about the needs of the responder to send a referral. By contrast, within a large social distance with less affectivity, the proposer tends to hesitate in sending a referral because she does not care whether her referral will benefit the responder. Hence, we propose the following:

H1a: *A proposer is more likely to send a referral to a responder (proposer acceptance) within a small social distance than to a responder with a large social distance.*

Table 1. Definitions of Key Constructs

Constructs	Definition
Social Distance	Mutual affectivity of a dyadic relationship
Fairness	Equality of the distribution of goods, benefits, and other outcomes
Referral Performance*	Two measures of whether the referral was successful:
Proposer acceptance	Whether the proposer agrees to send out a referral
Responder acceptance	Whether the responder accepts the referral, conditional on the proposer sending out the referral

*There is also a third, downstream performance measure we call *mutual acceptance*. Mutual acceptance captures the acceptance of both the proposer and responder. In the randomized field experiment, the responder must make a purchase to complete the referral of the proposer. In practice, mutual acceptance is the combination of provider acceptance and responder acceptance. We provide the following example to explain the three measures. Assume that a firm sends 200 referral invitations to proposers, 100 of these proposers accept such request (50% proposer acceptance), and 40 of the sent referrals are accepted by the responders (40% responder acceptance). However, the mutual acceptance rate (indicating overall success) is only 20%. We thank an anonymous reviewer for helping us to clarify this key distinction.

Following a similar logic, we propose the effect of social distance on the likelihood for a responder to accept a referral. Any action outside of what is common between the proposer and responder will lead them to think about the underlying motive of the action. In the context of social referrals, if a responder cannot clearly understand the purpose of the referral, then he/she tends to decline the offer. Responders want to know the real purpose of the referral (e.g., why is the proposer referring me to this store?). Given that a referral is primarily motivated by a product recommendation, responders tend to trust proposers within a small social distance and understand that such referral may be valuable and may fit their needs; accordingly, the responders will develop a high tendency to accept such referral. However, within a large social distance, due to lack of solid trust, responders may not know the real purpose of the referral and may be hesitant in accepting the offer. Hence, we propose the following:

H1b: *A responder is more likely to accept a referral from a proposer (responder acceptance) within a small social distance than from a proposer with a large social distance.*

Effect of Fairness on Referral Performance

Equally dividing \$10 (5, 5) is considered a fair offer, and an unequal offer is observed when either the proposer or responder takes more than what the other receives (i.e., if a responder received \$10 (or \$7) and the proposer received \$0 (or \$3)). Previous fairness studies consider a 50–50 split fair (objective equality) (e.g., Cook and Hegtvedt 1983; Eckhoff 1974). An offer with a large deviation from an equal or fair split (5, 5) is considered unfair by both the proposer and responder.

In a typical referral, the proposer has the right to agree to send the referral despite knowing that the responder may refuse the referral invitation because of its perceived unfairness. This resembles the ultimatum game (Güth et al. 1982; Güth and Tietz 1990), which is a two-player game where Player 1, the proposer, can offer to divide a fixed total amount (i.e., \$10) by giving x amount to Player 2 and keeping \$10-x for himself. Afterward, Player 2 decides whether to accept or reject the offer. In the unique sub-game perfect Nash equilibrium (Gibbons 1989), Player 1 takes the entire amount minus ε ($\varepsilon \to 0$), and Player 2 accepts ε with an equilibrium payoff of ($10 - \varepsilon$, ε). If ε is 0, then multiple equilibriums will emerge as (10, 0) and (0, 0), and Player 2 will not observe any differences in the probability between these equilibria. However, many experimental studies found that unfair offers tend to be rejected, whereas fair offers (50/50 split) are most likely to be accepted (Güth et al. 1982; Güth and Tietz 1990). An equal (or fair) split is an obvious compromise, and considerations are easily displaced by calculations of strategic advantage when players begin to appreciate the structure of the game (Binmore et al. 1985; Güth and Tietz 1990). We apply the standard literature definition of fairness in an ultimatum game setting to online referral systems in which the proposer and the responder receive the same amount (\$5) from a successful referral, that is, an equal 50–50 split of the \$10 initial amount. Deviations from an equal split are considered unfair (e.g., (0, 10), (3, 7), (7, 3), or (10, 0)).[6] If we assume that proposers are rational decision makers and are aware of the respondent's possible actions, then they are unlikely to deviate from the equilibrium decision of sending out a fair offer to maximize their own payoff. We thus hypothesize the following:

[6] Appendix D shows that such offers are not only objectively unfair based on the academic literature and common belief but are also *perceived* by our respondents to be unfair.

H2a: *A proposer is more likely to send a fair offer [5, 5] than an unfair offer (e.g., [0, 10], [10, 0], [3, 7], or [7, 3]).*

H2b: *A responder is more likely to accept a fair offer [5, 5] than an unfair offer (e.g., [0, 10], [10, 0], [3, 7], or [7, 3]).*

Interaction Effect of Fairness and Social Distance on Referral Performance

In online referral systems, the actions of the proposers and responders are dictated in tandem by their extrinsic motivation of maximizing their monetary profits based on the fairness rule and their intrinsic motivation (Camerer and Fehr 2004). Therefore, both extrinsic and intrinsic motivations are expected to have a role in referral success. Instead of considering economic and social factors independently from one another, an effective online social referral system must consider proposers and responders as both economic and social actors to study their extrinsic and intrinsic incentives.

Referral systems resemble the classic ultimatum game, but they have their unique features. In the traditional ultimatum game, proposers and responders are strangers. By contrast, online referrals take place among proposers and responders who are connected within a certain social distance. Although some studies have examined the role of the players' family name or kinship in the ultimatum game (Charness and Gneezy 2008; Macfarlan and Quinlan 2008), they merely focus on the context of strangers or acquaintances. The traditional ultimatum game may change due to the dyadic relationship between the two parties. Integrating theories of the quasi-ultimatum game (Güth et al. 1982) and social distance (Bogardus 1925) generates new insights. Two parties within a small social distance have a high affectivity and are expected to help each other (e.g., Berkowitz 1972; Lerner 1977); thus, these parties do not aim at maximizing their monetary payoff from the relationship. Therefore, the proposer is largely driven by his/her intrinsic motivation to receive the affective responses and potential relational value of the responder. Since the intrinsic motivation to consider social benefits dominates the extrinsic motivation to maximize monetary payoffs (Camerer and Fehr 2004), the fairness of the referral may not be very important. Moreover, fairly splitting the bonus reminds the proposer and responder of their respective extrinsic motivations, thus creating a cognitive dissonance within a small social distance that is generally governed by affectivity (Deutsch 1975; Lerner 1977). Also, responders within a small social distance are likely to trust proposers. Therefore, responders will perceive the referral from proposers as a product of intrinsic motivation (e.g., genuine advice) instead of extrinsic motivation (e.g., a monetary reward). However, when dealing with individuals with a large social distance, proposers and responders make rational decisions based on the economic rules of utility maximization, and their decisions are likely to be dominated by extrinsic motivation (Heyman and Ariely 2004). Therefore, the bonus split will govern the behaviors of the proposer and responder. Both sides of the referral prefer an equilibrium equal (or fair) bonus split (50–50), which represents objective equality, instead of an unfair bonus split. Therefore, offering an equal or fair split of the bonus will be effective for individuals with a large social distance. We propose the following:

H3: *Social distance moderates the effect of fairness on referral success:*
(a) The effect of fairness on the proposer's sending a referral is stronger within a large social distance than within a small social distance.
(b) The effect of fairness on the responder's accepting a referral is stronger within a large social distance than within a small social distance.

Research Methodology

We conducted a set of controlled laboratory experiments and a randomized field experiment to test our hypotheses. Such a multimethod approach allows us to leverage the strength of lab experiments to achieve internal validity and randomized field experiments to demonstrate external validity. The four experiments have the following design features. Experiment 1 is a pilot lab experiment on a referral to purchase products from a GroupBuy website. The pilot experiment aims to provide baseline insights into the effect of social distance and fairness on referral performance. Experiment 2 is a randomized field experiment conducted with a real-life online ticket retail company. This real-life field experiment builds on pilot Experiment 1 to support the external validity and robustness of the results by using a synchronized full factorial design. Experiment 3 serves as a robustness check for Experiment 2 by using an alternative measure of social distance (tie strength) for validation. Finally, Experiment 4 is a follow-up lab experiment using a different context (nonmonetary reward) to validate our results.

Pilot Experiment 1

Experiment 1 is a pilot study that seeks to gather initial evidence for H1a, H1b, H2b, and H3b.

Two laboratory experiments (one on proposers and the other on responders) were conducted concurrently in October 2011. To simulate a real-life online referral system, proposers and responders participated in the experiments independently, and they were not allowed to communicate with one another. The subjects were informed that the referral was for an online GroupBuy website and were then randomly assigned seats in a computer laboratory.

Table D1 shows the demographics of the subjects. We recruited 120 subjects as proposers and 360 subjects as responders. These subjects were undergraduate students from a large public university in China. As active online shoppers, the students are generally representative of the target population (Sia et al. 2009). In fact, many studies in the IS literature use students as subjects (e.g., Jiang and Benbasat 2007; Wang and Benbasat 2007, 2009). Each subject received 10RMB as monetary reward.[7] We performed an *ex ante* analysis of statistical power (Cohen 1992), and our sample size demonstrated an adequate statistical power (>80%) to detect a *medium* level effect.

Experimental Design

We employed a between-subjects one-factor (social distance) design for the proposer and a between-subjects **3** (bonus split: 0/10, 5/5, 10/0) × **2** (social distance: small versus large) full factorial designs for the responders. The online GroupBuy website shown to subjects contained many types of products, which were shown on the screen to the subjects. Related concepts, such as social distance, were explained to all subjects before the experiment. Specifically, social distance was explained based on the description of Bogardus (1925); in addition, pretests were conducted to ensure that the subjects correctly understood the meaning of the context, task, and questions. Before subjects received any treatment, they were informed about the duty of the responder (register and make purchases on a website) and the purpose of the referral bonus. Subjects in the different groups were not allowed to communicate, while subjects in each treatment condition were informed that the experiment would be kept strictly confidential.

Treatment Conditions

The first treatment was the fairness of the referral bonus split. We adopted three referral bonus split conditions, namely, (0,10) in which the proposer would receive $0 and the responder would receive $10, (5,5) in which objective equality was assumed as both the responder and proposer would receive $5, and (10,0) in which the responder would receive $0 and the proposer would receive $10.

The second treatment in the experimental design was social distance. We adapted Bogardus' seven categories of social distance (relative, close friends, neighbors, coworkers, co-citizens, visitors, within border) to two conditions (large and small social distance) as a dichotomy (Bogardus 1925, 1933). Notably, *relatives* and *close friends* typically have a small social distance, whereas *neighbors*, *coworkers*, and *co-citizens* typically have a large social distance. Finally, the *visitor* and *within border* categories were not included as they do not readily apply in our study.

Priming of Treatments

For the proposers, subjects were randomly assigned into two groups. Subjects in each group were primed with different social distances. For the large social distance group, the subjects were primed about individual acquaintances that they met on the Internet, but not in real life. For the small social distance group, subjects were primed about friends or family members with whom they had a close or intimate relationship (according to Bogardus). After priming social distance, proposers were asked to choose one of the three splits of bonus. Specifically, proposers were asked to understand the scenario, decide whether to send the referral to people within different social distances using an Internet-enabled communication tool (e.g., e-mail and instant messenger), and decide whether they should split the referral bonus (i.e., give the total referral bonus of $10 to the responder (0, 10), keep the full referral bonus of $10 (10, 0), or divide the bonus fairly (5, 5)). As our first measure, we used a three-item, seven-point Likert-type scale to measure the intention of proposers to send referrals to their friends (*referral intention*). Through a principal component analysis, these three items showed high convergent validity (the principal component explained 92% of the total variance).[8] Following a standard procedure, we averaged these three items as the overall measure for referral intention. *Referral split fairness* was our second measure. If the proposer chose the (5, 5) split, then this referral split would be deemed fair; otherwise, either ((0, 10) or (10, 0)) would be considered unfair.

Responders were randomly assigned into six groups. Subjects from each group were first primed with different social

[7]All amounts in this paper are expressed in the local currency of China (RMB).

[8]The eigenvalues of these three components are 2.77, 0.17, and 0.07, respectively, implying that the main component explained almost all of the variance.

distances. Subjects in the large social distance group were primed about individual acquaintances they met on the Internet, but not in real life. In contrast, subjects in the small social distance group were primed about friends or family member with whom they had a familiar or intimate relationship. After priming social distance, the subjects were oriented about how the referral bonus split would work. For example, the responders in the (0, 10) group were informed that they would receive \$10, while their proposers would receive \$0. After priming social distance and explaining the referral bonus split, the responders were asked whether they would accept the referral with a different split of bonus coming from individuals with varying social distances (1 = accept or 0 = decline).

We conducted manipulation checks via post-experiment surveys that gauged whether the proposers and the responders correctly understood the social distance and fairness of the bonus splits that were manipulated in the experiment. Two (1.7%) proposers and eight (2%) responders did not satisfy the manipulation check. Our reported results include all respondents. The results remained consistent if we exclude the respondents who did not pass the manipulation check.

Pilot Experiment 1 Results

The results of the analysis for the proposers are reported in Table 2. Model 1 estimated the effect of social distance on the proposer's intention (Likert-type scale ranging from 1 to 7). The result for social distance was consistent with a two-sample *t*-test ($t = -11.59$, $p < 0.001$). Models 2 estimated the linear probability of splitting the bonus fairly (5, 5) or unfairly [(0, 10) or (10, 0)]. The results are consistent with a two-sample *t*-test ($t = 5.34$, $p < 0.001$). Similarly, the histogram in Figure 1 visualizes the pattern. Thus, some initial evidence was found for H1a.

We observed an interesting pattern for responders. First, as hypothesized (H1b), social distance had a significant effect on the responder's act of accepting a referral offer (two-sample *t* test: $t = 5.98$, ($p < 0.001$)). We coded (5, 5) as a fair split and recoded (0, 10) and (10, 0) as unfair splits. The bonus split fairness also had a significant effect on the responder's act of accepting a referral offer on the basis of a two-sample *t* test ($t = 2.82$, $p < 0.01$). On average, the responder is likely to accept a fair offer, supporting H2b. Interestingly, we observed an interaction effect based on two-way ANOVA analysis ($F = 7.53$, $p < 0.01$). This effect shows that a fair split worked best for large social distances, but such fair split did *not* outperform any other split condition for small social distances (Figure 2).

We further conducted regression analyses by adding a set of covariates. The linear model estimations with control variables are reported in Table 3. We observed a significant interaction effect between social distance and fair split on the responder's probability to accept a referral offer. This interaction effect indicates that the fairness of an offer matters more for large social distances, supporting H3b.

Discussion of Pilot Experiment 1

Pilot Experiment 1 offers baseline results that provide initial support of H1a, H1b, H2b, and H3b. The key results are as follows. Proposers are more likely to send a referral to responders with a small social distance, and they tend to split the bonus fairly with responders who have a large social distance than with responders who have small social distances. Responders are likely to accept referral from a proposer with small social distance. A significant interaction effect exists between social distance and the bonus split on the responder's probability to accept a referral offer. This finding suggests that the fairness of an offer matters especially for large versus small social distances.

In the laboratory setting of Experiment 1, we did not use a full factorial design for the proposer. The allocation of proposers and responders was not synchronized (the experiment for the proposers and responders were ran separately, that is, the responders whom the proposers sent a referral were not the subjects in the experiment for the responders). Given that this study was a pilot "thought experiment," the proposers were aware that they were being primed in an experiment. Such approach achieves experimental realism, but it tends to induce demand effects if the subjects can figure out the objective of researchers. Thus, we developed a second modified experimental design to test these hypotheses in a synchronized full factorial randomized field experiment.

Randomized Field Experiment 2

According to pilot Experiment 1, we obtained some initial evidence that the effect of the fairness of bonus split on referral performance was moderated by the social distance between proposers and responders. We conducted a randomized field experiment to achieve three objectives. First, laboratory experiments are generally criticized for their lack of external validity, whereas the key strength of randomized field experiment is strong external validity. Second, we tweaked the experimental design to obtain a between-subjects, full factorial design for both proposers and responders to generate additional insights into the interaction effect on proposers. Third, a randomized field experiment will enable us to observe the proposer's referral behavior, the responder's acceptance behavior, and the overall referral success holistically. Such design follows the classic ultimatum game set-

Table 2. Results for Proposers

DV:	(1) Referral Intention	(2) Fair Split
Social Distance	−2.475***(0.269)	0.366***(0.081)
GroupBuy Exp	0.318*(0.176)	0.056(0.060)
Online Shopping Experience	−0.206(0.249)	0.088(0.069)
Age	0.104(0.082)	0.056**(0.025)
Gender	−0.484**(0.228)	−0.190**(0.075)
Constant	3.722**(1.831)	−0.714(0.568)
Observations	120	120
R-squared	0.566	0.281

Notes: Robust standard errors in parentheses; ***p < 0.01, **p < 0.05, *p < 0.1.

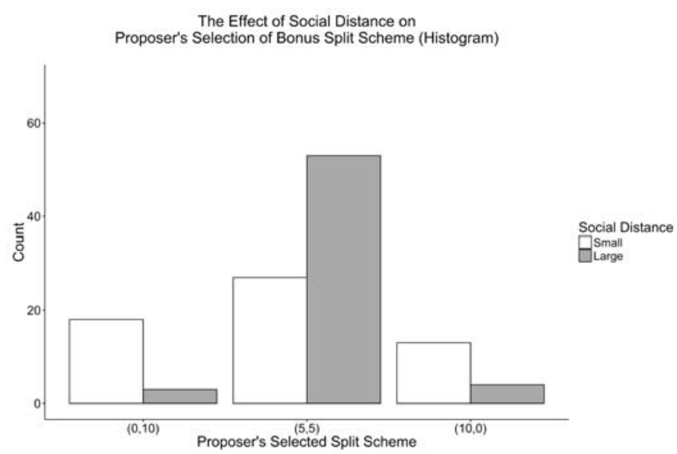

Figure 1. Distribution of the Proposer's Selected Bonus Split

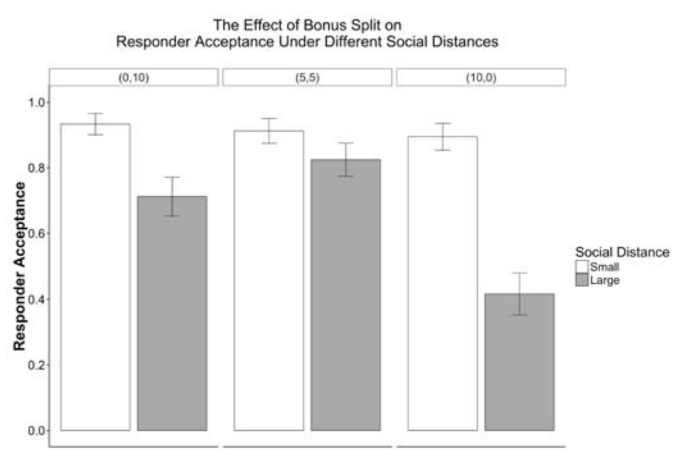

Figure 2. Probability that a Responder Will Accept a Referral

Table 3. Results for Responders (DV = Accept or Not)

	(1)	(2)
Social Distance	−0.127***(0.021)	−0.342***(0.053)
Fair Split	0.131***(0.042)	−0.006(0.046)
Social Distance × Fair Split		0.267***(0.081)
GroupBuy Experience	0.076*(0.041)	0.075*(0.040)
Online Shopping Experience	−0.013(0.052)	−0.007(0.052)
Age	0.027**(0.017)	0.033**(0.017)
Gender	0.057(0.042)	0.067(0.041)
Constant	0.237(0.407)	−0.002(0.401)
Observations	360	360
R-squared	0.133	0.155

Notes: Robust standard errors in parentheses; ***p < 0.01, **p < 0.05, *p < 0.1.

ting, and we seek to offer insights into the empirical literature of ultimatum games using a real-life field experiment. To conduct a randomized field experiment, we collaborated with 08tickets (http://www.08tickets.com/), a large online ticket retail company. The firm's major business is online sales of tickets, such as concerts, sports events, and scenic spots. Given the steady development of its online ticketing business, the firm has recently expanded to social commerce by initiating a social referral system. This randomized field Experiment 2 sought to test all six parts of our proposed hypotheses.

Experimental Design

Our field experiment had a between-subjects, **3** (bonus split: 3/7, 5/5, 7/3) × **2** (social distance: small versus large) full factorial design with six groups (Table D2). Below we describe the two treatments and the conditions within each treatment.

Treatment 1: Fairness of Bonus Split. We calibrated the bonus split scheme based on laboratory Experiment 1 and experiments in the ultimatum game literature. Our objective was to enable the treatment to be perceived as unfair and to allow each party to receive a portion of the referral bonus. Based on the ultimatum game literature, 30% is set as a cutting threshold at which offers are accepted by both the responder and proposers in an ultimatum game (Güth et al. 1982; Güth and Tietz 1990). If responders can obtain less than 30% of the entire amount, then most responders will tend to refuse offers. Thus, (7, 3) and (3, 7) are considered unfair, whereas (5, 5) is considered fair in terms of objective equality and perceived fairness. The significant differences in the perceived fairness of the bonus split conditions used in Experiment 2 are validated in Experiment 3.[9] Therefore, (7, 3), (5, 5), and (3, 7) were designed as three conditions of the first treatment, namely, fairness of the bonus split. The three different splits were (7, 3), proposers receive $7 and responders receive $3; (5, 5), proposers and responders receive $5 each (fair split); (3, 7), proposers receive $3 and responders receive $7. Neither the proposer nor the responder receives a referral bonus unless the responder accepts the referral and makes a purchase, closely mimicking the traditional ultimatum game. We used (7, 3), (3, 7) split because we wanted to test a bonus split that is practically relevant and is likely to be used by firms in practice. The corporate sponsor stated that the (0, 10), (10, 0) split would be extremely harsh on both sides and will be unlikely to be accepted by the responder and even to be sent by the proposer.

Treatment 2: Social Distance. Similar to the method in the pilot study (Experiment 1), we used two levels of social distance. According to Bogardus (1947), a large social distance typically refers to coworkers or acquaintances, whereas a small social distance implies close friends or relatives with a personal or intimate relationship. Social distance is conceptualized and measured in the same way as Experiment 1.

Outcome Measures: Referral Performance. We used "proposer's acceptance to refer a friend" (*proposer acceptance*) and "responder's acceptance conditional on proposer sending an offer" (*responder acceptance*) as two outcome variables to measure referral performance. We also used *mutual accep-*

[9] Details of this fairness perception are provided in the subsection "Results of Randomized Field Experiment 2.

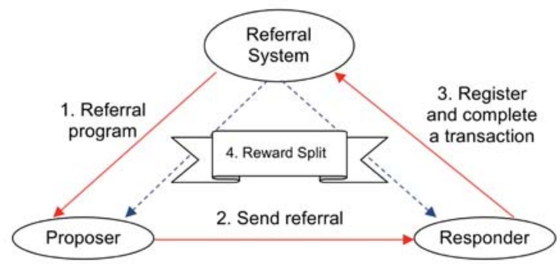

Figure 3. Experiment 2 Referral System Flow Chart

tance as the outcome variable for referral performance (Luo et al. 2014). *Mutual acceptance* occurs after a proposer sends out an offer, the responder accepts the offer, and makes a purchase on 08tickets.

Experimental Procedure

Figure 3 visualizes the process of the referral system. We report the details below.

The field experiment process is as follows: The corporate partner (08tickets) used a standard random procedure algorithm to select (current) customers as proposers. The selected customers (proposers) were randomly assigned to one of our six treatment groups (full factorial) by sending an email from the firm's online referral system and the intended split of bonus given a certain social distance. The proposers were also instructed to send the referral to one responder with either small (relative/close friend) or large (neighbor/co-worker/acquaintance) social distance with another individual (responder) based on an adapted five-item social distance scale based on Bogardus' original seven-item scale[10] (Karakayali 2009). Sample conditions are provided in Table 4.

We opted for an adapted social distance scale of Bogardus because this scale is simple, straightforward, and all participants would understand the scale correctly to achieve effective priming. If the proposer agreed to send the referral to the responder, she/he would click a URL to complete an online form. Proposers provided their email address and that of the responder who will receive the referral. After finishing the online form, proposers were asked to answer several questions about the best description of the responder. Their responses were based on Bogardus' scale and a three-item survey instrument that measures the dyadic relationship with the responder (details on the manipulation check are offered in Appendix D). Responders (e-mail address provided by the proposers) received e-mails with explanations of the online referral system, split of bonus, and the name and e-mail address of the proposer (informing them who the proposer is). Responders were asked to click a URL to complete the web form designed for the responder. They either agreed or refused to register on 08tickets. Responders who elected to register on 08tickets were asked to answer questions about the best description of the responder based on the Bogardus scale and a three-item survey instrument that measures the dyadic relationship with the proposer (details in the manipulation check section). The random assignment process kept running and was stopped when 20 respondents were collected in each condition. An *a priori* power analysis showed that 20 responses per treatment would empower us to test a medium to a large effect with a statistical power of 0.60 ($p < 0.05$) (Cohen 1992). For each treatment, we recorded data for non-accepting respondents in addition to the 20 respondents who accepted. In total, we obtained 165 respondents per treatment to achieve the required 20 subjects per condition. Finally, *08ticket* distributed the bonus between the proposers and responders according to their selected bonus split. This experimental design ensured random assignment and adequate statistical power for analysis.

Results of Randomized Field Experiment 2

Our field study was conducted between December 2012 and February 2013. A total of 986 randomly selected current customers of the firm received solicitation e-mails for the field experiment. Out of the 986 observations, 120 proposers sent the referral offer to the responders. 79 responders registered on 08tickets and made a purchase. According to the study design, proposers were influenced by many stochastic

[10]Bogardus' seven-category items are (1) marry/have as a kin; (2) be friends; (3) have as a neighbor; (4) work together; (5) accept as a co-citizen (or acquaintance); (6) accept as a visitor in his/her country; (7) does not accept at all within the country borders. Because categories 6 and 7 do not fit our context, we only used categories 1 to 5.

Table 4. Sample Conditions for the Field Experiment	
(3, 7) Small	Sample e-mail text in Chinese: 给您的亲朋好友发个推荐吧！我们将奖励您￥3，被推荐人可以得到￥7！ English translation: Send a referral to your good friend or relative! We will reward you ¥3, and your friend will receive ¥7.
(5, 5) Large	Sample e-mail text in Chinese: 给您的同事，邻居或网友发个推荐吧！我们将奖励您￥5，被推荐人也可以得到￥5！ English translation: Send a referral to your coworker, neighbor or Internet friend! We will reward you ¥5, and your friend will receive ¥5.

factors before taking part in the field study. A comparison between early and late responders indicated that nonresponse bias tests (Armstrong and Overton 1977) showed no statistical differences between respondents and nonrespondents. The summary statistics and correlation matrix are shown in Table D3.

To test our hypotheses, independent sample *t* statistics and two-way ANOVA were used. We further complemented group comparisons and ANOVA with linear regressions. First, we used a two-sample *t*-test to examine H1. A comparison of the percentage of referrals showed that a proposer is likely to send a referral to a responder (*proposer acceptance*) with small social distance (t = 2.79, p < 0.01). Hence, H1a was supported. We then compared *responder acceptance* between large and small social distances. Given a large social distance, the average percentage of the responders' acceptance was 0.52. In a small social distance, the average percentage of responders' acceptance was 0.80. The average percentage of *responder acceptance* with a small social distance was significantly higher than that with a large social distance (t = 3.4, p < 0.001). Hence, H1b was supported. Finally, a comparison of the percentage of *mutual acceptance* (combination of the proposer's and responder's acceptances) showed that a successful referral will more likely to occur in relationships with a small social distance than those in relationships with a large social distance (t = 4.29, p < 0.001). These results provided strong support for H1.

Second, we examined the effect of fairness of the bonus split on referral success. The percentage of *proposer acceptance* with a fair split was 0.137, whereas the percentage of *proposer acceptance* with an unfair split was 0.115. A two-sample *t*-test showed that the difference was only marginally significant (t = 1.2, p = 0.1), lending marginal support to H2a. The difference for *responder acceptance* was not statistically significant (t = 0.68, p = 0.25). Therefore, H2b was not supported. Finally, a two-sample *t*-test showed an insignificant difference for mutual *acceptance* (t = 1.18, p = 0.12).

Third, we tested the interaction effect between social distance and fairness of the bonus split. The group comparisons are visualized in Figure 4. Two-way ANOVA was used to test the main and interaction effects. We found a significant main effect of social distance (F = 2.99, p < 0.01), while the interaction effect of social distance with fairness of bonus split was marginal (F = 1.48, p = 0.11). Therefore, suggestive evidence supports H3a.

The percentage of responders who received $3 (7, 3), $5 (5, 5) and $7 (3, 7) was 0.9, 0.65, and 0.85, respectively, for *responder acceptance* that is conditional on the proposer who sends an offer with small social distance. For a large social distance, the percentage of responders who receive $3 (7, 3), $5 (5, 5), and $7 (3, 7) was 0.25, 0.75, and 0.55, respectively (Figure 5). Using a two-way ANOVA, we tested the interaction effect between social distance and bonus split on responder's acceptance, and found a significant effect (t = 3.39, p < 0.001). Therefore, H3b was supported. In breaking down the two unfair conditions, we did not observe a significant difference in responder's acceptance with small social distance. In contrast, responders with large social distance were less likely to accept a referral if they received a small amount of the bonus between the two unfair conditions.

For *mutual acceptance,* Figure 6 visualizes the group comparisons. Two-way ANOVA was used to test the main and interaction effects. We found a significant main effect (F = 5.14, p < 0.001) of social distance. The interaction effect of social distance with fairness of bonus split was significant (F = 2.97, p < 0.01). We further estimated the effects using regression analysis, as shown in Table 5.

Discussion of Experiment 2

We used a synchronized full factorial design (respondents in the responder treatment were referred by the proposers in the proposer treatment), wherein randomized field Experiment 2 tests all proposed hypotheses. We found support for H1a, H1b, H3a, and H3b. However, we did not find support for H2a or H2b. The key results are as follows. Proposers are likely to send to responders with a small social distance. A significant interaction effect exists between social distance and a fair split on the proposer's likelihood of sending a referral offer, such that proposers are more likely to send a referral

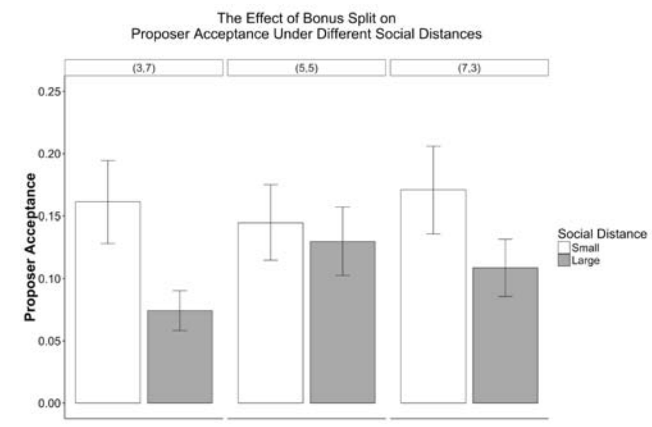

Figure 4. Probability of Proposer's Sending a Referral

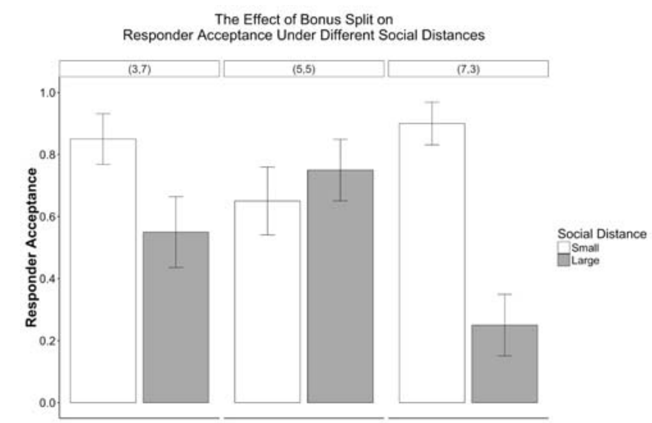

Figure 5. Probability of Responder Accepting a Referral

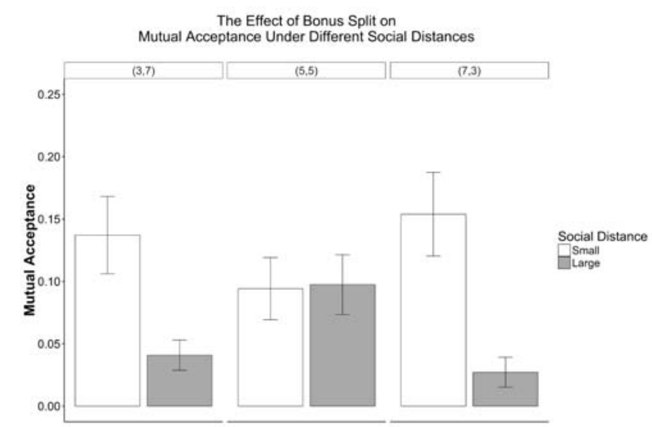

Figure 6. Probability of Mutual Acceptance

Table 5. Estimation of Main and Interaction Effects for Experiment 2

	(1) Proposer	(2) Proposer	(3) Responder	(4) Responder	(5) Mutual	(6) Mutual
Social Distance	-0.058**	-0.078***	-0.283***	-0.475***	-0.074***	-0.110***
	(0.023)	(0.027)	(0.084)	(0.095)	(0.020)	(0.024)
Fairness	0.014	-0.021	0.063	-0.225*	0.013	-0.051
	(0.024)	(0.038)	(0.093)	(0.121)	(0.021)	(0.034)
Social Distance × Fairness		0.063		0.575***		0.113***
		(0.049)		(0.175)		(0.042)
Constant	0.153***	0.166***	0.779***	0.875***	0.122***	0.145***
	(0.021)	(0.024)	(0.055)	(0.053)	(0.020)	(0.023)
Observations	986	986	120	120	986	986
R-Squared	0.008	0.010	0.093	0.175	0.019	0.028

Notes: Robust standard errors in parentheses; ***p < 0.01, **p < 0.05, *p < 0.1.

with a fair bonus split to responders with a large social distance than to those with a small social distance. Responders were also more likely to accept a referral from a proposer with a small social distance. Also, a significant interaction effect was found between social distance and the fair bonus split on the responder's probability to accept a referral offer, such that fairness of an offer matters more for large social distances. The probability of mutual referral acceptance is high for referrals with a small social distance. Finally, a significant interaction effect was shown between social distance and the fair split on the probability of success of mutual referral, such that the fairness of an offer matters more for relationships with a large social distance.

As with all field experiments, one limitation is that the environment is not as carefully controlled as lab experiments. However, we have employed a multitude of measures, including two follow up surveys, to check the validity of manipulations and our assumptions (Appendix D). Given that the main results of field Experiment 2 are largely consistent with the controlled laboratory Experiment 1, the concern that the experimental setting may have biased the results is largely alleviated.

Next, we will present two additional experiments. In Experiment 3, we manipulated an objective measure of social distance based on the frequency of interaction between the proposer and the responder. In Experiment 4, we seek to further support the generalizability of our findings to non-cash incentives (cloud space). We used a slightly tweaked treatment of the bonus split (random split versus equal split).

Experiment 3

In pilot lab Experiment 1 and randomized field Experiment 2, we manipulated social distance based on the "affective social distance" measure proposed by Bogardus (1947). This approach has been widely used, but other approaches were also commonly used to measure social distance. For example, social distance could be characterized by the frequency of interaction, which is also known as "interactive social distance" (Karakayali 2009). The main idea behind this measurement approach is similar to the concept of the "strength of social ties" in social network theory (Granovetter 1973). In Experiment 3, we seek to assess the robustness of our findings from the first two experiments by manipulating interactive social distance (tie strength) as the measure of social distance based on the frequency of interactions between the proposer and responder. Tie strength is an important predictor of trust, and it has been established as an important concept in the online social networks literature (Bapna et al. 2017; Ou et al. 2014). Experiment 3 tests all six hypotheses proposed in this study.

Experimental Design

We employed a between-subjects, **4** (bonus split: 0/10, 5/5, 10/0, and x/10-x) **× 2** (tie strength: strong versus weak) full factorial design with two treatments (Table D5). Similar to the first two experiments, the first treatment was fairness of the bonus split. We had four conditions for this treatment, namely, (0, 10), (5, 5), (10, 0), and (x, 10-x). The first three conditions were similar to those in our pilot study (Experiment 1). The last condition (x, 10-x) was a separate condition that allowed the proposer to make a decision to keep a chosen amount and to leave the rest to the responder. This condition is analyzed separately. Similar to Experiments 1 and 2, we used two levels of tie strength (interactive social distance) between the proposer and responder. Following the conceptualization of interactive social distance, a weak tie refers to proposers and responders with infrequent interactions (no interaction in the past three months). A strong tie refers to the proposer and the responder having frequent interactions (at least they interacted three times in the past month).

Experimental Procedure

The experiments were conducted in March 2016. First, we recruited 800 students from a large public university in China. Subjects could receive course credits and 2RMB reward for participating in the experiment. Subjects were first asked to complete a simple task of providing two names from their WeChat[11] account, one whom they have not contacted in the past three months and another whom they have interacted at least three times in the past month. Proposers were instructed to write down the WeChat ID of both contacts. A total of 796 subjects (563 in the first three conditions for *fairness*) entered our experiment as proposers by adding the researcher's WeChat official account for the experiment, signing up on a survey website, and finishing a questionnaire. The survey questionnaire asked subjects about their online social networking behaviors and demographics. The proposers were then randomly assigned to one of the eight treatment groups based on their interactive social distance (frequency of interaction) and the bonus split. Subjects were asked to respond to the question asking them to refer one of the WeChat contacts they provided (randomly determined by the researcher) to join the survey website and complete the survey for a certain bonus split (also randomly determined by the researcher). If the proposer agreed to send the referral with certain referral bonus split, the proposer was asked to send the QR code of the questionnaire to the responder. If the proposer refused to send the referral, the experiment ended. If the proposers sent the referrals to their WeChat contacts (responders), the responders received the QR code from the proposers. After tapping the QR code, the responders decided whether to accept the referral on account of the referral bonus split. In addition, they were asked to sign up on a website to complete the survey questionnaire. If the proposer accepted the referral, she was required to finish the questionnaire, and the referral bonus would be distributed between the two parties according to the bonus split chosen by the proposer.

[11]WeChat is a popular instant messaging app in China and other countries, particularly among Chinese people.

Results of Experiment 3

We began the analysis with the proposers' referral behavior. First, we conducted two-sample t tests to confirm H1a, which states that proposers are likely to send a referral to a responder with strong ties ($t = 3.30$, $p < 0.001$). H1b was also confirmed because responders are likely to accept the referral from a proposer whom they have maintained a strong relationship ($t = 2.93$, $p < 0.01$).

Second, in terms of fairness, two-sample t tests found that, on average, proposers did have preference for sending fair offers ($t = 2.95$, $p < 0.01$). This finding supports H2a. However, the responders did not show a preference for accepting fair offers ($t = 0.61$, $p = 0.27$), which does not support H2b.

Third, significant interaction effects exist between tie strength and fairness. Two-way ANOVA showed a significant interaction effect for all three outcome measures ($p < 0.001$). As shown in Figures 7, 8, and 9 and Table 6, a fair offer was effective for weak-tie referrals. As in Experiments 1 and 2, we report pairwise TUKEY t-tests in Appendix C for all measures of referral success.

For the responders, when we broke down the two unfair groups, similar to what was observed in the first two experiments, no significant difference was found in the responder's acceptance if he or she has a strong tie with the proposer. However, responders with weak ties to a proposers are less likely to accept a referral if they receive a small amount.

We proceed to discuss the (x, 10-x) conditions. These conditions do not directly test our hypotheses, but they triangulate with the main findings by providing additional evidence on how proposers select the bonus split. These conditions follow a similar experimental procedure as reported above, but the proposers were not provided with the bonus split. Despite the absence of the bonus split, they were prompted to a page with a sliding bar to split the bonus themselves. The sliding bar's numerical tickers are integers between 0 and 10, which indicate the amount the proposer wanted to keep for himself out of the 10RMB bonus. Therefore, in the (x, 10-x) condition, the proposer was asked to choose *any* bonus split scheme. We examined the distribution of the proposers' selections (Figure 10). Consistent with our predictions, proposers in the weak tie group were more likely to select to send a fair offer compared with proposers in the strong tie group.

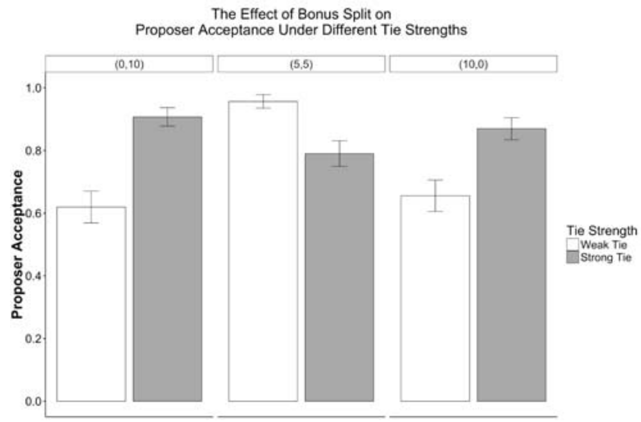

Figure 7. Proposer's Probability to Send a Referral

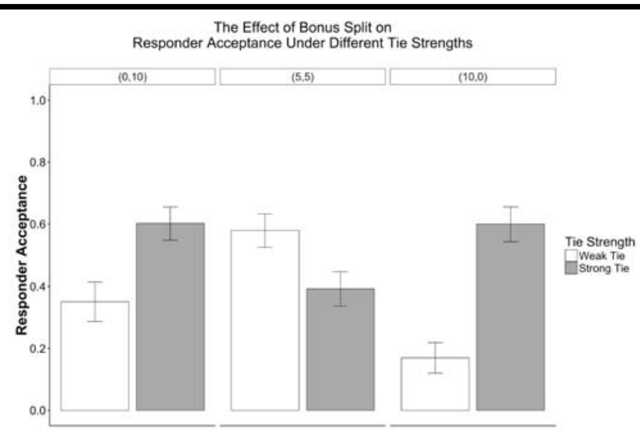

Figure 8. Responder's Probability to Accept a Referral

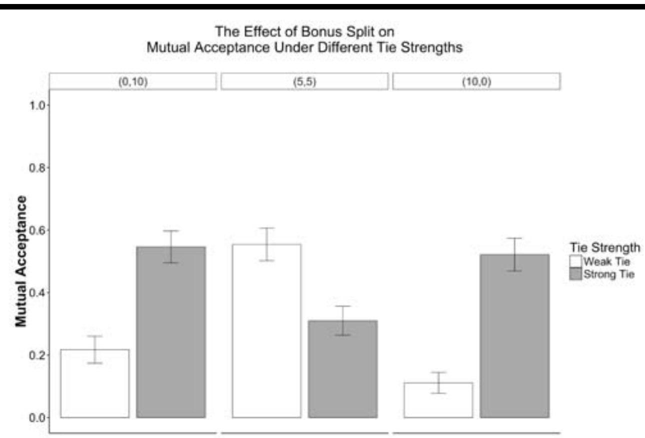

Figure 9. Mutual Acceptance Probability

Table 6. Estimation of Main and Interaction Effects for Experiment 3

DV:	(1) Proposer	(2) Proposer	(3) Responder	(4) Responder	(5) Mutual	(6) Mutual
Tie Strength (TS)	0.109***	0.252***	0.143***	0.343***	0.160***	0.370***
	(0.033)	(0.042)	(0.047)	(0.056)	(0.040)	(0.046)
Fairness	0.103***	0.319***	0.047	0.321***	0.072	0.390***
	(0.033)	(0.042)	(0.049)	(0.067)	(0.044)	(0.059)
TS*Fairness		-0.418***		-0.530***		-0.614***
		(0.063)		(0.095)		(0.083)
Constant	0.710***	0.637***	0.377***	0.259***	0.271***	0.165***
	(0.031)	(0.036)	(0.038)	(0.041)	(0.028)	(0.028)
Observations	563	563	451	451	563	563
R-squared	0.034	0.096	0.021	0.085	0.033	0.122

Notes: Robust standard errors in parentheses; ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$.

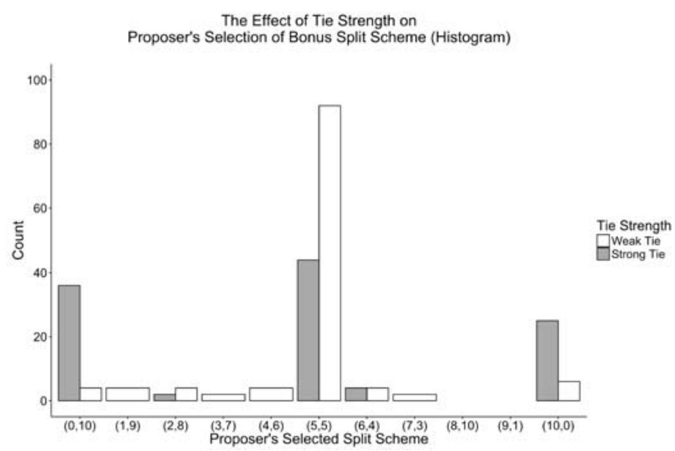

Figure 10. Proposer's Selection of the Bonus Split in the (x, 10x) Condition

Discussion of Experiment 3

The results of Experiment 3 support H1a, H1b, H2a, H3a, and H3b. There is no support for H2b. There are a few unique aspects of this experiment. First, we used a synchronized full factorial design for the proposer. In Experiment 1, we used a one-factor design that asked the proposer to select the referral bonus split. Second, in Experiment 3, we used a measure of interactive social distance based on the frequency of interactions as opposed to affective social distance from Experiment 1 and Experiment 2. The results from Experiment 3 show that the results of laboratory Experiment 1 and randomized field Experiment 2 can be largely replicated from affective social distance (friends versus acquaintances) to interactive social distance (frequency of interaction). This result indicates the robustness and generalizability of the main findings (H1a, H1b, H3a, and H3b).

Experiment 4

We conducted another laboratory experiment (Experiment 4) that uses non-cash incentives (cloud space) and a slightly adjusted treatment of the bonus split (random split versus an equal split). The proposers and responders were primed on social distance similar to Experiment 1. In the equal allocation (500MB, 500MB) treatment, proposers and responders were explained that both parties would split the 1000MB space equally. In the random split groups, proposers and responders were explained that the cloud service company will randomly distribute the 1000MB space between proposers and respondents. In Experiment 4, we again empirically observed a significant main effect for social distance and an interaction effect between bonus split and social distance. The results provide additional evidence to further enhance the generalizability of our findings to other contexts. Due to page limitations, the details of Experiment 4 are reported in the section "Experiment 4" in in Appendix D.

General Discussion

Key Findings

The set of four experiments corroborate with each other to offer robust empirical support for our hypotheses on the role of social distance and fairness in determining the success of online social referral systems. Our results suggest that social distance and fairness jointly affect referral success. First, we find consistent evidence that social distance decreases the probability of a successful referral. Second, we found some evidence that referrals with a fair split were preferred. Still, we did not obtain consistently significant results across different experiments, therefore this effect is not conclusive. Third, we found that the effect of fairness on referral success is moderated by social distance. This finding indicates that fairness enhances referral performance when the social distance between the proposer and responder is large (acquaintances). By contrast, within a small social distance (friends), proposers tend to send a referral with an unfair split, and responders are more likely to accept referrals with unfair split as well. This finding indicates that the effectiveness of fairness in referral performance is bounded by the dyadic relationship between proposers and responders is close (friends). Table 7 summarizes our key findings.

Theoretical Implications

This study contributes and has theoretical implications to several streams of literature.

First, this study uses an experimental approach to offer guidelines on the design of an IT artifact (online social referral system), thus contributing to the literature on system design (e.g. Ba et al. 2001; Hevner et al. 2004), the design of WOM systems (e.g., Bezos et al. 2000) and particularly for the design of online social referral systems. The optimal incentive structures derived in this study could be used to design a broad set of IT artifacts that leverage monetary incentives and social relationships to reach out to consumers. Our study extends the current literature on referral system design by considering the fairness of bonus split as a unique construct beyond monetary incentives, thereby offering new insights. While past research has primarily focused on monetary incentives (Wirtz and Chew 2002) and brand (Ryu and Feick 2007) in understanding the optimal design of offline referral incentive systems in a lab setting, this study brings the fairness of referral bonus and social distance to the forefront to extend research on the incentive design for referral programs. Also, while prior research primarily relied on lab experiments, our study triangulates both lab experiments and a randomized field experiment, offering both internal and external validity.

Second, this study has broad implications for online "social commerce" (Curty and Zhang 2011, Liang and Turban 2011). Given that the Internet has strengthened the social behavior of consumers (Bapna and Umyarov 2015), many of our online "friends" are not friends in the traditional sense. Our findings suggest that in social commerce, social context and the affective nature of social relationships matter beyond simple economic rationality and fairness rules. Thus, social commerce should take the nature of the relationship into account when seeking to understand the effectiveness of different IT systems. For example, research on recommendation agents could look at how information on friends with different social distances affect recommendation effectiveness.

Third, our results offer empirical evidence for the boundary conditions of the ultimatum game. Notably, we found that strangers, but not friends, tend to focus on the fairness of an offer. This finding is extended to the notion of social commerce, which also means that the social environment (social distance between the proposer and the responder) could affect people's reactions to objective equality (fair split of bonus). Our study also reveals bounded rationality in individual decision making (Bapna et al. 2017; Simon 1982). In practice, not everyone is a rational person who aims at profit maximization. Individuals have intrinsic motivations that focus on the welfare of their friends or the whole group rather than on the individual's personal payoff. Simply put, economic rationality is bounded by social distance, and monetary incentive does not always work effectively.

Practical Implications for Information Systems Design

Online referral systems are incentive mechanisms used by firms to reach out to new consumers by leveraging the social relationships of their existing customers. If firms fail to capitalize on social relationships, their investment in social referrals may be wasted. Proposers and responders act as social entities in online referral systems because they are active IS users (Lamb and Kling 2003), and firms may be able

Table 7. Summary of Key Findings

Effect	Proposer Acceptance	Responder Acceptance	Mutual Acceptance
Social Distance (main effect)	Supported	Supported	Supported
Fairness (main effect)	Not conclusive	Not conclusive	Not conclusive
Social Distance × Fairness (interaction)	Supported	Supported	Supported

to obtain reliable data on the social relationships of users. For example, firms could obtain affective social distance and tie strength data by working with social media platforms with technologies such as social logins with a social messaging, such as Twitter, and "Facebook Instant Personalization." In this sense, firms may be able to obtain and leverage the social distance data of customers in designing their referral incentives in a nonintrusive manner.

Firms should carefully consider how to leverage incentives to acquire new customers. In some cases, offering a monetary incentive, which is presumably costly for firms, may not be effective. The monetary bonus of online referral systems could attract people's attention, but this does not mean that they will become new customers. To take advantage of social commerce, firms should consider people's intrinsic motivations and devote their attention to proper design incentives to account for different social distances between proposers and responders. Notably, if the monetary incentives of an online referral system are not compatible with people's intrinsic motivations, they may be even harm social referrals. Given a small social distance, firms should focus on people's intrinsic motivations and divert their attention from the bonus split. Given a large social distance, firms should focus on the fairness of the bonus split. In sum, online social referral systems should account for the dominant motivation that governs the behavior of proposers and responders.

Limitations and Opportunities for Future Research

This study has four key limitations that create interesting opportunities for future research: *First*, all four experiments were conducted in China, which may limit its generalizability to other countries. However, data from China have been extensively used by similar studies in mobile targeting in the context of SMS coupons (Luo et al. 2014), online commerce (Hong and Pavlou 2014), swift *guanxi* (Ou et al. 2014), and mobile ads (Andrews et al. 2015). Bearing this in mind, we believe in the value of extending this study to other countries, which may be an interesting opportunity for future research. Related to this point, the bonus rewards used in the studies are relatively small 10 RMB (~1.5 USD). However, in the United States, referral bonuses are usually about $10, consistent with the higher cost of living. Future research may examine whether the size of bonus would moderate the observed relationships. *Second*, in the randomized field Experiment 2, we were able to capture the one-time purchase of respondents due our agreement with the cooperating online ticketing firm. Future research could examine whether different referral incentive structures would interact with social distances to affect subsequent purchases and long-term customer value. *Third*, we study referral systems with full information disclosure in all experiments as both sides of the referral are informed of what the other side would obtain in terms of referral bonus. Despite this approach, we did not examine the possible role of information disclosure. Information disclosure practices are adopted in practice and are key system design aspects. Such practices present another interesting opportunity for future research. *Fourth*, we focused on peer-to-peer referrals, but we did not examine referral broadcasting. Future research could examine the joint effects of different bonus split fairness and different referral channels (e.g., social media versus e-mail) on referral performance. Finally, a limitation with Experiment 2 is that our corporate partner, 08tickets, an online ticketing site for concert and sport event tickets. Thus, the context is likely geared toward close friends rather than acquaintances, thus accentuating the main effect of social distance. Future research could thus examine other contexts, settings, and products.

Conclusion

An effective referral system provides tangible value for firms. Focusing on monetary incentives in a social relationship may render the referral message confusing, and even potentially harmful for close social relationships, thus lowering the effectiveness of online referral systems. An emphasis on fairness among friends with small social distance could be interpreted as an act of neglecting the social rules of a close relationship. Such act maybe harmful for such social relationships. Online social communities allow connections among acquaintances, and focusing on fairness in such distant social relationships could enhance referral success. In summary, if monetary incentives are not compatible with the intrinsic motivations and social relationships of individuals, such incentives may not be effective and they may even harm to social referrals. Our study espouses the design of *socially sensitive* online referral systems that takes into consideration both monetary incentives and social relationships. This approach calls for attention on social relationships where strict adherence to rational economic rules can be harmful to online social commerce.

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RESEARCH ARTICLE

ON THE ROLE OF FAIRNESS AND SOCIAL DISTANCE IN DESIGNING EFFECTIVE SOCIAL REFERRAL SYSTEMS

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Appendix A

Existing Industry Practices in Referral Bonus Incentive Structure[1]

Company	Proposer Receives:	Responder Receives:	How is bonus split informed
Groupon	Free after 3 referrals	0	Separately
OptionsHouse	$150	0	Separately
SPG AMEX	5000 points	0	Separately
Dropbox	250G	250G	Both
Scottrade	3 free trades	3 free trades	Both
Wirefly	$25	$25	Both
Uber	$10	$10	Both
Evernote	Points	Premium Account	Separately
Boston Globe	$15	4 weeks of subscription	Separately
Rock Botom Golf	$10	5% off	Separately
Student Advantage	$25	$10	Separately
Café Press	$10	Free mini poster	Separately
Lending Club	0	$25	Separately

[1]Part of the data comes from Referral*Candy* (http://www.referralcandy.com/).

Appendix B

Social Distance Measurement Items Sources

Table B1. Bogardus Measure's Use and Adaptations			
Author(s)	**Year**	**Journal**	**Measurement Adaptation**
Cover	1995	*The Journal of Social Psychology*	Original Bogardus Social Distance Scale
Parrillo and Donoghue	2005	*The Social Science Journal*	Original Bogardus Social Distance Scale
Payne et al.	1974	*Sociometry*	Adapted Bogardus Social Distance Scale The scale contains eight instructional sets which reveal different degrees of intimacy in order.
Lee et al.	1996	*The Journal of Social Psychology*	Adapted Bogardus Social Distance Scale The author revised the original Bogardus social distance scale to explain a minority group's perceptions of the distance established by the majority group between itself and the minority group.
Wilson	1996	*Public Opinion Quarterly*	Adapted Bogardus Social Distance Scale The author chose 2 of 7 items from the original Bogardus social distance scale, and ask the subjects give 5 points scale to descript the two items.
Verkuyten and Kinket	2000	*Social Psychology Quarterly*	Adapted Bogardus Social Distance Scale The Bogardus social distance scale was revised to suit for the study context with Dutch preadolescents, which contained three description of social distance.
Horak Randall and Delbridge	2005	*Sociological Spectrum*	Adapted Bogardus Social Distance Scale The revised Bogardus social distance scale was used to test the social distance among different ethnic people in north Carolina rural county.
Wark and Galliher	2007	*The American Sociologist*	Adapted Bogardus Social Distance Scale The scale would be changed from seven to five items based on the immigration context. The author points out that the Social Distance Scale usually consists of five to seven statements that express progressively more or less intimacy toward the group considered.

Social Distance Manipulation Check

The questions are on a seven-point Likert type scale (X is the name of the subject's relative, neighbor, friend, coworker or acquaintance): (Q1) X and I follow each other on social networking sites; (Q2) X and I value our relationship on social networking sites; (Q3) X and I share private content on social communities; (Q4) X and I talk about private topics in social networking sites; (Q5) X and I belong to the same discussion groups in social networking sites; (Q6) I would recommend my friends and relatives to follow X on social networking sites; (Q7) X and I use the same verbiage in online social networking sites.

Table B2. Sources of Social Distance Measures Used in Manipulation Check

Author Year	Year	Journal	Measure
Warner and Defleur	1969	*American Sociological Review*	Q3, Q5, Q7
Brewer et al.	1987	*Personality and Social Psychology Bulletin*	Q1, Q5, Q6
Boxer	1993	*Journal of Pragmatics*	Q2, Q3, Q4, Q5, Q7
Akerlof	1997	*Econometrica*	Q1, Q5
Krackhardt and Kilduff	1999	*Journal of Personality and Social Psychology*	Q6
Bottero and Prandy	2003	*Journal of Sociology*	Q1, Q2, Q5, Q7
Fossett	2006	*Journal of Mathematical Sociology*	Q1, Q3, Q4, Q7
Buchan et al.	2006	*Journal of Economic Behavior & Organization*	Q1, Q2, Q5, Q7
Ahmed	2007	*Journal of Economic Psychology*	Q1, Q2, Q5, Q7
Kim et al.	2008	*Journal of Consumer Research*	Q1, Q2
Liviatan et al.	2008	*Journal of Experimental Social Psychology*	Q2, Q3, Q5, Q6
Leeson	2008	*Journal of Legal Studies*	Q3, Q4, Q7
Hipp and Perri	2009	*City and Community*	Q1, Q5

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Appendix C

Results of Pairwise Comparisons (TUKEY)

In this appendix, we report the TUKEY HSD test results for all the experiments with a full factorial design. Specifically, the TUKEY HSD statistics were calculated after ANOVA tests.

Table C1. TUKEY Test for Perceived Fairness

Proposer							Responder						
grp	vs.	grp	Group means		diff	HSD-test	grp	vs.	grp	Group means		diff	HSD-test
(10, 0)	vs.	(7, 3)	1.31	2.37	1.05	19.08*	(10, 0)	vs.	(7, 3)	1.35	2.38	1.03	19.25*
(10, 0)	vs.	(5, 5)	1.31	6.19	4.88	88.28*	(10, 0)	vs.	(5, 5)	1.35	6.5	5.14	96.08*
(10, 0)	vs.	(3, 7)	1.31	2.33	1.02	18.52*	(10, 0)	vs.	(3, 7)	1.35	2.59	1.23	23.06*
(10, 0)	vs.	(0, 10)	1.31	1.29	0.02	0.43	(10, 0)	vs.	(0, 10)	1.35	1.49	0.13	2.51
(7, 3)	vs.	(5, 5)	2.36	6.19	3.82	69.20*	(7, 3)	vs.	(5, 5)	2.39	6.50	4.11	76.82*
(7, 3)	vs.	(3, 7)	2.36	2.33	0.03	0.56	(7, 3)	vs.	(3, 7)	2.39	2.59	0.20	3.80*
(7, 3)	vs.	(0, 10)	2.36	1.29	1.08	19.51*	(7, 3)	vs.	(0, 10)	2.39	1.49	0.90	16.75*
(5, 5)	vs.	(3, 7)	6.19	2.33	3.85	69.76*	(5, 5)	vs.	(3, 7)	6.50	2.5895	3.91	73.03*
(5, 5)	vs.	(0, 10)	6.19	1.29	4.90	88.71*	(5, 5)	vs.	(0, 10)	6.50	1.49	5.01	93.57*
(3, 7)	vs.	(0, 10)	2.33	1.29	1.05	18.94*	(3, 7)	vs.	(0, 10)	2.59	1.49	1.10	20.54*

Note: Critical value is 3.489 for 0.1 level significance.

Table C2. TUKEY Test for Experiment 1 (Responder)

grp	vs.	Grp	Group means		Dif	HSD-test
(0, 10) small	vs.	(5, 5) small	0.9333	0.9123	0.0211	0.4277
(0, 10) small	vs.	(10, 0) small	0.9333	0.8947	0.0386	0.7841
(0, 10) small	vs.	(0, 10) large	0.9333	0.7119	0.2215	4.4992*
(0, 10) small	vs.	(5, 5) large	0.9333	0.8246	0.1088	2.2098
(0, 10) small	vs.	(10, 0) large	0.9333	0.4167	0.5167	10.4963*
(5, 5) small	vs.	(10, 0) small	0.9123	0.8947	0.0175	0.3564
(5, 5) small	vs.	(0, 10) large	0.9123	0.7119	0.2004	4.0716*
(5, 5) small	vs.	(5, 5) large	0.9123	0.8246	0.0877	1.7821
(5, 5) small	vs.	(10, 0) large	0.9123	0.4167	0.4956	10.0686*
(10, 0) small	vs.	(0, 10) large	0.8947	0.7119	0.1829	3.7151*
(10, 0) small	vs.	(5, 5) large	0.8947	0.8246	0.0702	1.4256
(10, 0) small	vs.	(10, 0) large	0.8947	0.4167	0.4781	9.7122*
(0, 10) large	vs.	(5, 5) large	0.7119	0.8246	0.1127	2.2895
(0, 10) large	vs.	(10, 0) large	0.7119	0.4167	0.2952	5.9971*
(5, 5) large	vs.	(10, 0) large	0.8246	0.4167	0.4079	8.2866*

Note: Critical value is 3.677 for 0.1 level significance.

Table C3. TUKEY Test for Experiment 2

grp	vs.	Grp	Group means		Diff	HSD-test
Proposer Acceptance						
(3, 7) small	vs.	(5, 5) small	0.1613	0.1449	0.0164	0.6184
(3, 7) small	vs.	(7, 3) small	0.1613	0.1709	0.0096	0.3647
(3, 7) small	vs.	(3, 7) large	0.1613	0.0743	0.0869	3.286
(3, 7) small	vs.	(5, 5) large	0.1613	0.1299	0.0314	1.1875
(3, 7) small	vs.	(7, 3) large	0.1613	0.1087	0.0526	1.9878
(5, 5) small	vs.	(7, 3) small	0.1449	0.1709	0.026	0.9832
(5, 5) small	vs.	(3, 7) large	0.1449	0.0743	0.0706	2.6675
(5, 5) small	vs.	(5, 5) large	0.1449	0.1299	0.0151	0.5691
(5, 5) small	vs.	(7, 3) large	0.1449	0.1087	0.0362	1.3694
(7, 3) small	vs.	(3, 7) large	0.1709	0.0743	0.0966	3.6507
(7, 3) small	vs.	(5, 5) large	0.1709	0.1299	0.0411	1.5523
(7, 3) small	vs.	(7, 3) large	0.1709	0.1087	0.0622	2.3526
(3, 7) large	vs.	(5, 5) large	0.0743	0.1299	0.0555	2.0984
(3, 7) large	vs.	(7, 3) large	0.0743	0.1087	0.0343	1.2981
(5, 5) large	vs.	(7, 3) large	0.1299	0.1087	0.0212	0.8003
Note: Critical value is 3.667 for 0.1 level significance.						
Responder Accept (conditional on Proposer Acceptance)						
grp	**vs.**	**grp**	**Group means**		**Diff**	**HSD-test**
(3, 7) small	vs.	(5, 5) small	0.85	0.65	0.2	2.0668
(3, 7) small	vs.	(7, 3) small	0.85	0.9	0.05	0.5167
(3, 7) small	vs.	(3, 7) large	0.85	0.55	0.3	3.1002
(3, 7) small	vs.	(5, 5) large	0.85	0.75	0.1	1.0334
(3, 7) small	vs.	(7, 3) large	0.85	0.25	0.6	6.2004*
(5, 5) small	vs.	(7, 3) small	0.65	0.9	0.25	2.5835
(5, 5) small	vs.	(3, 7) large	0.65	0.55	0.1	1.0334
(5, 5) small	vs.	(5, 5) large	0.65	0.75	0.1	1.0334
(5, 5) small	vs.	(7, 3) large	0.65	0.25	0.4	4.1336*
(7, 3) small	vs.	(3, 7) large	0.9	0.55	0.35	3.6169
(7, 3) small	vs.	(5, 5) large	0.9	0.75	0.15	1.5501
(7, 3) small	vs.	(7, 3) large	0.9	0.25	0.65	6.7171*
(3, 7) large	vs.	(5, 5) large	0.55	0.75	0.2	2.0668
(3, 7) large	vs.	(7, 3) large	0.55	0.25	0.3	3.1002
(5, 5) large	vs.	(7, 3) large	0.75	0.25	0.5	5.1670*
Note: Critical value is 3.701 for 0.1 level significance.						
Mutual Acceptance						
grp	**vs.**	**grp**	**Group means**		**Diff**	**HSD-test**
(3, 7) small	vs.	(5, 5) small	0.1371	0.0942	0.0429	1.9691
(3, 7) small	vs.	(7, 3) small	0.1371	0.1538	0.0167	0.7689
(3, 7) small	vs.	(3, 7) large	0.1371	0.0409	0.0962	4.4165*
(3, 7) small	vs.	(5, 5) large	0.1371	0.0974	0.0397	1.8222
(3, 7) small	vs.	(7, 3) large	0.1371	0.0272	0.1099	5.0462*
(5, 5) small	vs.	(7, 3) small	0.0942	0.1538	0.0596	2.738
(5, 5) small	vs.	(3, 7) large	0.0942	0.0409	0.0533	2.4473
(5, 5) small	vs.	(5, 5) large	0.0942	0.0974	0.0032	0.1469
(5, 5) small	vs.	(7, 3) large	0.0942	0.0272	0.067	3.0771
(7, 3) small	vs.	(3, 7) large	0.1538	0.0409	0.113	5.1854*
(7, 3) small	vs.	(5, 5) large	0.1538	0.0974	0.0564	2.5912
(7, 3) small	vs.	(7, 3) large	0.1538	0.0272	0.1267	5.8151*
(3, 7) large	vs.	(5, 5) large	0.0409	0.0974	0.0565	2.5942
(3, 7) large	vs.	(7, 3) large	0.0409	0.0272	0.0137	0.6298
(5, 5) large	vs.	(7, 3) large	0.0974	0.0272	0.0702	3.224
Note: Critical value is 3.667 for 0.1 level significance.						

Table C4. TUKEY Test for Experiment 3

Proposer Acceptance						
grp	**vs.**	**grp**	**group**	**means**	**Diff**	**HSD-test**
(0, 10) weak tie	vs.	(0, 10) strong	0.6196	0.9072	0.2877	7.3009*
(0, 10) weak tie	vs.	(5, 5) weak	0.6196	0.9565	0.337	8.5523*
(0, 10) weak tie	vs.	(5, 5) strong	0.6196	0.79	0.1704	4.3258*
(0, 10) weak tie	vs.	(10, 0) weak	0.6196	0.6556	0.036	0.9135
(0, 10) weak tie	vs.	(10, 0) strong	0.6196	0.8696	0.25	6.3453*
(0, 10) strong	vs.	(5, 5) weak	0.9072	0.9565	0.0493	1.2514
(0, 10) strong	vs.	(5, 5) strong	0.9072	0.79	0.1172	2.9751
(0, 10) strong	vs.	(10, 0) weak	0.9072	0.6556	0.2517	6.3874*
(0, 10) strong	vs.	(10, 0) strong	0.9072	0.8696	0.0377	0.9556
(5, 5) weak	vs.	(5, 5) strong	0.9565	0.79	0.1665	4.2265*
(5, 5) weak	vs.	(10, 0) weak	0.9565	0.6556	0.301	7.6389*
(5, 5) weak	vs.	(10, 0) strong	0.9565	0.8696	0.087	2.2071
(5, 5) strong	vs.	(10, 0) weak	0.79	0.6556	0.1344	3.4124
(5, 5) strong	vs.	(10, 0) strong	0.79	0.8696	0.0796	2.0195
(10, 0) weak	vs.	(10, 0) strong	0.6556	0.8696	0.214	5.4318*
Note: Critical value is 3.671 for 0.1 level significance.						
Responder Acceptance						
grp	**vs.**	**Grp**	**group**	**means**	**Diff**	**HSD-test**
(0, 10) weak tie	vs.	(0, 10) strong	0.2174	0.5464	0.329	6.6572*
(0, 10) weak tie	vs.	(5, 5) weak	0.2174	0.5543	0.337	6.8182*
(0, 10) weak tie	vs.	(5, 5) strong	0.2174	0.31	0.0926	1.8739
(0, 10) weak tie	vs.	(10, 0) weak	0.2174	0.1111	0.1063	2.1505
(0, 10) weak tie	vs.	(10, 0) strong	0.2174	0.5217	0.3043	6.1584*
(0, 10) strong	vs.	(5, 5) weak	0.5464	0.5543	0.008	0.161
(0, 10) strong	vs.	(5, 5) strong	0.5464	0.31	0.2364	4.7833*
(0, 10) strong	vs.	(10, 0) weak	0.5464	0.1111	0.4353	8.8077*
(0, 10) strong	vs.	(10, 0) strong	0.5464	0.5217	0.0247	0.4988
(5, 5) weak	vs.	(5, 5) strong	0.5543	0.31	0.2443	4.9443*
(5, 5) weak	vs.	(10, 0) weak	0.5543	0.1111	0.4432	8.9687*
(5, 5) weak	vs.	(10, 0) strong	0.5543	0.5217	0.0326	0.6598
(5, 5) strong	vs.	(10, 0) weak	0.31	0.1111	0.1989	4.0244
(5, 5) strong	vs.	(10, 0) strong	0.31	0.5217	0.2117	4.2845*
(10, 0) weak	vs.	(10, 0) strong	0.1111	0.5217	0.4106	8.3089*
Note: Critical value is 3.673 for 0.1 level significance.						
Mutual Acceptance						
grp	**vs.**	**Grp**	**group**	**means**	**Diff**	**HSD-test**
(0, 10) weak tie	vs.	(0, 10) strong	0.2174	0.5464	0.329	6.9892*
(0, 10) weak tie	vs.	(5, 5) weak	0.2174	0.5543	0.337	7.1582*
(0, 10) weak tie	vs.	(5, 5) strong	0.2174	0.31	0.0926	1.9673
(0, 10) weak tie	vs.	(10, 0) weak	0.2174	0.1111	0.1063	2.2578
(0, 10) weak tie	vs.	(10, 0) strong	0.2174	0.5217	0.3043	6.4654*
(0, 10) strong	vs.	(5, 5) weak	0.5464	0.5543	0.008	0.169
(0, 10) strong	vs.	(5, 5) strong	0.5464	0.31	0.2364	5.0218*
(0, 10) strong	vs.	(10, 0) weak	0.5464	0.1111	0.4353	9.2469*
(0, 10) strong	vs.	(10, 0) strong	0.5464	0.5217	0.0247	0.5237
(5, 5) weak	vs.	(5, 5) strong	0.5543	0.31	0.2443	5.1908*
(5, 5) weak	vs.	(10, 0) weak	0.5543	0.1111	0.4432	9.4160*
(5, 5) weak	vs.	(10, 0) strong	0.5543	0.5217	0.0326	0.6927
(5, 5) strong	vs.	(10, 0) weak	0.31	0.1111	0.1989	4.2251*
(5, 5) strong	vs.	(10, 0) strong	0.31	0.5217	0.2117	4.4981*
(10, 0) weak	vs.	(10, 0) strong	0.1111	0.5217	0.4106	8.7232*
Note: Critical value is 3.671 for 0.1 level significance.						

Table C5. TUKEY Test for Experiment 4

Proposer						
grp	**vs.**	**grp**	**group**	**means**	**diff**	**HSD-test**
(fair, small)	vs.	(fair, large)	5.14	4.25	0.89	5.0575*
(fair, small)	vs.	(random, small)	5.14	5.66	0.52	2.955
(fair, small)	vs.	(random, large)	5.14	4.2778	0.8622	4.8997*
(fair, large)	vs.	(random, small)	4.25	5.66	1.41	8.0125*
(fair, large)	vs.	(random, large)	4.25	4.2778	0.0278	0.1579
(random, small)	vs.	(random, large)	5.66	4.2778	1.3822	7.8546*
Note: Critical value is 3.262 for 0.1 level significance.						
Responder						
grp	**vs.**	**grp**	**group**	**means**	**diff**	**HSD-test**
(fair, small)	vs.	(fair, large)	5.1698	4.9792	0.1906	1.1817
(fair, small)	vs.	(random, small)	5.1698	5.8367	0.6669	4.1339*
(fair, small)	vs.	(random, large)	5.1698	4.7885	0.3813	2.3638
(fair, large)	vs.	(random, small)	4.9792	5.8367	0.8576	5.3156*
(fair, large)	vs.	(random, large)	4.9792	4.7885	0.1907	1.1821
(random, small)	vs.	(random, large)	5.8367	4.7885	1.0483	6.4976*
Note: Critical value is 3.262 for 0.1 level significance.						

Appendix D

Additional Details

Experiment 1

Table D1. Demographics of Lab Study Participants

Social Distance	Gender		Age	Online Shopping Experience	Online Groupbuy Experience
Proposer					
Small	Male 55.1%		21.33(1.491)	2.021(0.6163)	1.810(0.5760)
Large	Male 56.7%		21.70(1.197)	2.100(0.5431)	1.717(0.7386)
Responder					
Small	(10, 0)	Male 57.9%	21.02(1.482)	2.053(0.5484)	1.754(0.5757)
	(5, 5)	Male 54.4%	21.47(1.283)	2.123(0.5025)	1.772(0.7324)
	(0, 10)	Male 53.3%	21.30(1.280)	2.033(0.5197)	1.617(0.6132)
Large	(10, 0)	Male 56.7%	21.33(1.311)	2.000(0.5523)	1.650(0.6593)
	(5, 5)	Male 56.1%	21.07(1.534)	2.105(0.5569)	1.824(0.6303)
	(0, 10)	Male 57.5%	21.34(1.254)	2.068(0.5208)	1.712(0.6708)

Table D2. Descriptive Statistics and Correlation Matrix†						
	Mean	**STD**	**1**	**2**	**3**	**4**
1. Social Distance	0.62	0.48	1			
2. Fairness	0.30	0.46	-0.12*	1		
3. Proposer Acceptance	0.12	0.33	-0.09*	0.03	1	
4. Final Acceptance	0.08	0.27	-0.14*	0.04	0.79*	1

Note: *p < 0.05
† Responder's acceptance is not in the correlation matrix due to difference in sample size. This is because only responders who receive an invitation from a proposer are observed.

Experiment 2

Table D3. 3 × 2 Factorial Design of Field Experiment 2		
(7, 3) Large Social Distance	(5, 5) Large Social Distance	(3, 7) Large Social Distance
(7, 3) Small Social Distance	(5, 5) Small Social Distance	(3, 7) Small Social Distance

Manipulation Check of Social Distance

We used a set of four survey questions to check the social distance manipulation. First, we used the same adapted five-category version of the Bogardus' original social distance scale as in the priming stage. Subjects were asked to choose which category the other party fits in. Out of 240 subjects, none selected "neighbor" as the category. As Table D4 attests, 16 pairs did not choose the same category as the other party (5 proposers believed responders to be relatives, whereas 5 responders stated the proposers to be friends; 3 proposers stated responders to be friends, whereas 3 responders stated to be relatives; 2 proposers stated responders to be coworkers, whereas 2 responders stated to be acquaintances; 6 proposers stated responders to be acquaintances, whereas 6 responders stated to be coworkers). Because Category 1 (relative) and 2 (friends) are considered small social distance, while Category 4 (coworker) and 5 (acquaintance) are considered large social distance by Bogardus, the manipulation check shows that the subjects have a proper understanding of social distance (small versus large). We further used a three seven-point Likert-type scale survey instrument adapted from the literature to check whether Bogardus' measure properly captured the affect-based social distance.[2] The proposer's and the responder's answers had a high correlation of 98%, indicating that social distance was manipulated appropriately, and subjects fell into appropriate treatments.

Table D4. Manipulation Check of Social Distance				
Social Distance	**Bogardus' Measure**	**Proposer = Responder**	**Proposer**	**Responder**
Small	1. Relative	11 pairs	5	3
	2. Friend	41 pairs	3	5
Large	3. Neighbor	0	0	0
	4. Coworker	12 pairs	2	6
	5. Acquaintance	40 pairs	6	2

[2]The three survey items are: (1) We engage in conversations on personal topics on our social networking sites/apps; (2) We have small groups in social networking sites/apps; and (3) We closely follow each other on social networking sites/apps.

Manipulation Check of Fairness

We made three attempts in checking the manipulation of fairness.

First, in checking the fairness measure, if the proposer or the responder did not understand the bonus split correctly, their responses were excluded. We believe such a test could help weed out subjects who did not understand the manipulation of the fairness of the bonus split. Only subjects who were cognizant that they would receive a certain amount (3, 5, or 7) out of the total of 10 were included in the analysis.

Second, although we used objective fairness as a variable, we checked whether the objective fairness (5, 5) was perceived as fair, and whether (7, 3) or (3, 7) were perceived as unfair. We conducted two additional randomized 2 × 5 between-subjects experiments (one for proposers and one for responders) with 994 users of a similar demographic profile under the same experimental scenario, and we report the results below. For both proposers and responders, (3, 7) and (7, 3) were considered unfair (< 2.5 on a scale of 1–7), while (5, 5) were considered fair (> 6 on a scale of 1–7). Furthermore, as shown in Figure D1, a symmetric pattern also emerged that (3, 7), (0, 10) are not significantly different from (7, 3) and (10, 0), respectively. We provide the results of TUKEY HSD tests of group mean differences in Table C1 of Appendix C.

Third, with a follow-up survey, we were able to obtain additional manipulation-check data for 38.75% of the subjects who participated (45 proposers and 48 responders) in our randomized field experiment, about the perceived fairness of the bonus split treatment they received. We observed a high correlation between our dichotomous fairness measure and subjects' perceived fairness (96.5%). The relationship is graphically shown in Figure D2.

In sum, these three manipulation checks ensured that the bonus split fairness was properly manipulated and perceived by subjects.

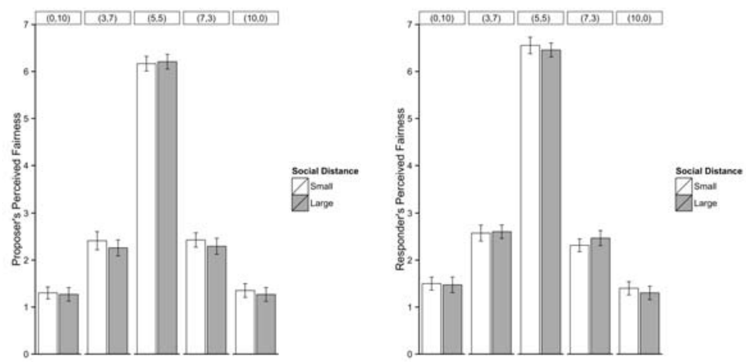

Figure D1. Proposer's and Responder's Perceived Fairness

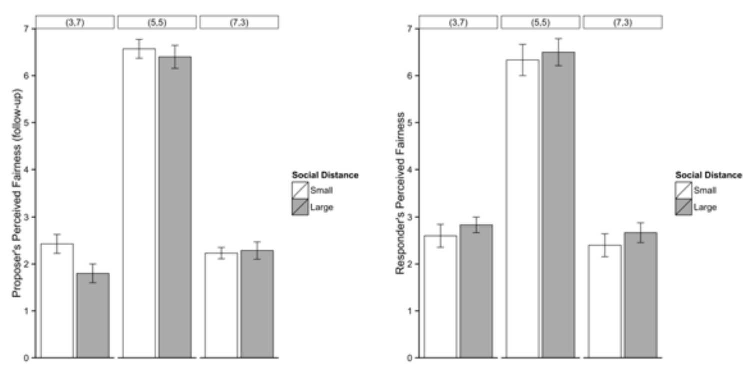

Figure D2. Proposer's and Responder's Perceived Fairness (Field Experiment Participants)

Selection Bias of E-Mail Recall

It is possible that proposers were more likely to remember the e-mails of a friend than of an acquaintance, and they might not want to incur the extra effort to look up the e-mail of an acquaintance, leading to the low referral rate for an acquaintance. Nonetheless, this was not a serious threat to validity for two reasons: First, normally people do not remember an e-mail address, irrespective of the relationship. Second, e-mail addresses are easily located in contact address books within seconds (e.g., Microsoft Outlook or Mac Mail). To assess the role of this potential selection bias, we conducted another one-factor (social distance) between-subjects experiment to check whether subjects perceived that it was more difficult to find the e-mail of a friend versus of an acquaintance. A total of 208 subjects were recruited, and they were randomly selected to either the “Small Social Distance” group (106 subjects) or the “Large Social Distance” group (102 subjects). Subjects were primed about the social distance according to Bogardus and our lab Experiment 1. Subjects were asked to answer two questions on a seven-point Likert-type scale: first, “It is easy to remember the e-mail address of that friend (1: very difficult; 7: very easy)”; second, “I need to utilize an address book in the e-mail system to find the e-mail of that friend (1: strongly disagree; 7: strongly agree)”. A manipulation check on social distance including Bogardus’s scale and three additional questions were performed. 95% of the subjects passed the manipulation check. Interestingly, we found the following result, as shown in Figure D3.

First, under either conditions (small or large social distances), subjects found it difficult to remember a responder’s e-mail; second, subjects strongly believed they needed to use the contact address book of an e-mail system to find the responder’s e-mail; third, there were small and statistically insignificant differences under small versus large social distances for ease to remember an e-mail (two sample *t* test: $t = 1.49$, $p = 0.137$) and the need for contact address book (two sample *t* test: $t=-1.55$, $p=0.123$).

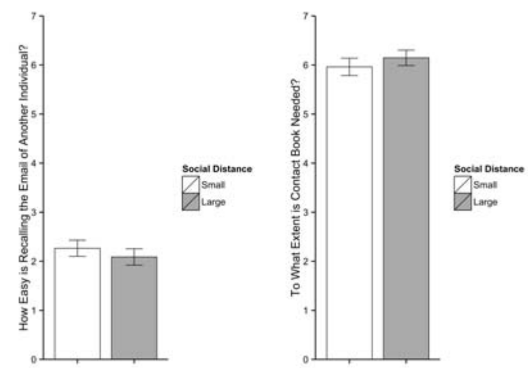

Figure D3. Social Distance and Friend’s E-Mail

Social Distance Measure in Online Social Relationship

To further check the validity of the social distance measure, we obtained additional data via a follow-up survey on the online social network relationships between the proposer and the responder via seven questions, respectively, for proposers and responders. We report these measures and their sources in Appendix B above. The average correlation of these measures with our experimentally set of social distances and perceived social distances (manipulation check) are over 90% ($p < .001$) for both proposers and responders.

Experiment 3

Table D5. 4 × 2 Factorial Design of Field Experiment

(10, 0) Weak Tie	(5, 5) Weak Tie	(0, 10) Weak Tie	(x, 10-x) Weak Tie
(10, 0) Strong Tie	(5, 5) Strong Tie	(0, 10) Strong Tie	(x, 10-x) Strong Tie

Table D6. Demographics of Experiment 3

Proposer			
Tie Strength	**Bonus Split**	**Gender**	**Age**
Strong	(10, 0)	Male 72.8%	22.01(1.719)
	(5, 5)	Male 75.0%	20.48(1.306)
	(0, 10)	Male 74.2%	20.43(1.274)
	(x, 10-x)	Male 75.8%	19.87(0.8854)
Weak	(10, 0)	Male 77.8%	22.20(1.523)
	(5, 5)	Male 73.9%	20.48(1.330)
	(0, 10)	Male 76.1%	20.34(1.244)
	(x, 10-x)	Male 76.4%	20.13(0.9787)
Responder			
Tie Strength	**Bonus Split**	**Gender**	**Age**
Strong	(10, 0)	Male 56.0%	22.08(1.398)
	(5, 5)	Male 58.8%	20.21(1.343)
	(0, 10)	Male 55.4%	19.98(1.087)
	(x, 10-x)	Male 57.5%	20.46(2.344)
Weak	(10, 0)	Male 57.1%	22.43(1.207)
	(5, 5)	Male 57.7%	20.33(1.368)
	(0, 10)	Male 53.8%	20.19(1.443)
	(x, 10-x)	Male 55.5%	20.28(1.501)

Experiment 4

To check the robustness of hypotheses testing and to provide additional insights, we conducted another Experiment 4 (that comprises of two studies) using a between-subjects 2 × 2 lab experimental design, respectively, for proposers and responders. There are two experimental variations: First, in order to strengthen the generalizability of the findings from incentives in the form of cash rewards to incentives in non-cash rewards, we use cloud storage as the reward. Second, in the previous two experiments, for the unfair conditions, we used actual figures ((10, 0) and (0, 10) in pilot lab Experiment 1 and (7, 3), (3, 7) in randomized field Experiment 2), in Experiment 3, we used a random split versus a fair split. Using a random split (the actual realization of the split is *a priori* unknown to either proposers or the responders) allowed us to further identify the interaction effect beyond the four types of splits ((0, 10), (10, 0), (3, 7) and (7, 3)) that were used in the pilot lab Experiment 1 and the randomized field Experiment 2.

Recruitment of Subjects

Two separate lab studies were conducted concurrently during December 2013, one on proposers and the other on responders. Proposers and responders participated in these two studies independently, and they were not allowed to communicate with each other during the studies. During an introduction session, subjects were explained that they will be sending/responding to referrals about a cloud storage service. Cloud storage services offer a different context as the bonuses are not cash rewards but storage spaces. Subjects acting as proposers and responders were randomly assigned seats in a computer lab. We recruited a total of 210 subjects as proposers and 210 subjects as responders. Subjects were undergraduate students from a large public university in China. Each subject received ¥10 as a monetary compensation.

Experimental Design

Subjects were shown the cloud service on the computer screen. Related concepts such as social distance (large, small) were explained to all subjects before the experiment. Before subjects received any treatments, they were told the duty of the responder (register for a cloud storage service account) and the referral bonus (free storage spaces), respectively within each group. Subjects across groups were *not* allowed to communicate about the study. Subjects were also informed that the experiment was anonymous.

Treatment Conditions

The first treatment in the experimental design was *social distance*, designed in the same way as the first lab experiment (referral to a GroupBuy website). The second treatment was the *split of the referral bonus*. We two different referral bonus split conditions: fair split (500MB, 500MB), for which both the responder and proposer would receive 500MB of free cloud service storage; random split of 1000MB of cloud storage space, for which the proposer and the responder would receive a random portion of the total of 1000MB (the actual realization of the split is *a priori* unknown), distributed by the cloud storage service company.

Priming of Treatments

First, all subjects in different groups were primed with different social distances in the same way as the pilot lab Experiment 1 (referral to a GroupBuy website). Second, after priming social distance, researchers explained how the referral bonus split would work. Specifically, in the equal allocation (500MB, 500MB) treatment, proposers and responders were explained that both parties will split the 1000MB space equally; in the random split groups, proposers and responders were explained that the cloud service company will randomly distribute the 1000MB space between proposers and respondents. Consequently, proposers and responders were asked about their likelihood of sending the referral to another individual or to accept the referral from another individual, respectively, measured with a seven-point Likert type interval variable (1 = most unlikely, 7 = most likely).

Using a similar approach to pilot lab Experiment 1, a manipulation check was built into the experiment to ensure that respondents had correctly understood the social distance and bonus splits. If a subject could not correctly recall the primed social distance or bonus split, the observation is not used. There were 4 (1.9%) proposers and 6 (2.9%) responders who did not pass the manipulation check, and they were all dropped.

Experiment 4 Results

We used independent sample *t*-tests, a linear model (OLS) and an ordered logistic model to estimate the effect of social distance, random (versus equal) split and their interaction effect on the likelihood of proposing and accepting a referral. Counterfactually, if Experiment 3 could replicate the results from the pilot lab Experiment 1 and the randomized field Experiment 2, we would observe the random split treatment to have an opposite effect from the fairness split treatment we focused on in the first two experiments. Using independent sample *t*-tests, we found a significant main effect of social distance for both the proposers' intention to send a referral ($t = 6.42$, $p < 0.001$) and the responders' intention to accept the referral ($t = 3.72$, $p < 0.001$). The effect of the treatment "random split" had a no significant main effect ($p > 0.1$) for both the proposers and the responders.

Estimation results are reported in Tables D7 and D8. We also plotted the marginal effects for the linear model to graphically show the interaction effects. We observed several findings that are consistent with the previous experiments. First, both proposers and responders tend to accept referrals from friends with a small social distance. Second, both proposers and responders tend to prefer a random split than the equal split under a small social distance (than under a large social distance), indicating a significant interaction effect.

Experiment 4 Discussion

There are three key differences in the experimental design between Experiment 4 and lab Experiment 1: first, we used a full factorial design for the proposer (in lab Experiment 1 we used a one-factor design that asked the proposer to select the referral bonus split); second, in Experiment 3, we used a slightly tweaked treatment condition that is different from both Experiment 1 and Experiment 2—random split versus a fair split (as opposed to the enforced unfair split conditions (10, 0) and (0, 10)); third, we used a non-cash type incentive (cloud storage) as opposed to monetary incentive in the form of cash in lab Experiment 1 and randomized field Experiment 2. Overall, the results from Experiment 4 show that the results of our lab Experiment 1, randomized field Experiment 2 and Experiment 3 can be replicated, indicating the robustness and generalizability of the main findings.

Table D7. Proposer's Intention of Sending a Referral

	(1) OLS Main Effect	**(2) OLS w/ Interaction**	**(3) Ordered Logit Main Effect**	**(4) Ordered Logit w/Interaction**
Social Distance	**-1.160*** **	**-0.864*** **	**-1.653*** **	**-1.118*** **
	(0.173)	(0.261)	(0.269)	(0.370)
Random Split	0.230	**0.530** **	0.296	**0.866** **
	(0.182)	(0.234)	(0.274)	(0.380)
Social Distance × Random Split		**-0.592***		-1.117**
		(0.355)		(0.541)
Gender	-0.227	-0.246	-0.353	-0.412
	(0.178)	(0.179)	(0.266)	(0.268)
Cloud Usage Experience	-0.0981	-0.117	-0.150	-0.194
	(0.146)	(0.151)	(0.209)	(0.217)
Age	-0.232**	-0.242**	-0.369**	-0.392***
	(0.0968)	(0.0985)	(0.145)	(0.145)
Constant	11.40***	11.53***		
	(2.514)	(2.556)		
Observations	206	206	206	206
R^2	0.21	0.223	0.068	0.074

Notes: Robust standard errors in parentheses, ***p < 0.01, **p < 0.05, *p < 0.1.
Pseudo R^2 are reported for Logit and ordered logit models**.**

Table D8. Responder's Intention of Accepting a Referral

	(1) OLS Main Effect	**(2) OLS w/ Interaction**	**(3) Ordered Logit Main Effect**	**(4) Ordered Logit w/Interaction**
Social Distance	**-0.578*** **	-0.112	**-0.987*** **	-0.114
	(0.167)	(0.248)	(0.274)	(0.364)
Random Split	**0.294***	**0.755*** **	0.421	**1.352*** **
	(0.166)	(0.221)	(0.258)	(0.374)
Social Distance × Random Split		**-0.923*** **		**-1.832*** **
		(0.327)		(0.548)
Gender	-0.174	-0.186	-0.257	-0.288
	(0.171)	(0.170)	(0.265)	(0.267)
Cloud Usage Experience	-0.243	-0.269	-0.322	-0.401
	(0.174)	(0.174)	(0.273)	(0.275)
Age	0.105*	0.115**	0.167*	0.201**
	(0.0597)	(0.0577)	(0.0992)	(0.0947)
Constant	3.341**	2.920**		
	(1.491)	(1.442)		
Observations	202	202	202	202
R^2	0.099	0.136	0.060	0.040

Notes: Robust standard errors in parentheses, ***p < 0.01, **p < 0.05, *p < 0.1.
Pseudo R^2 are reported for Logit and ordered logit models.