Job Market Paper

The Reputational Benefits and Material Burdens of Prosocial Referral Incentives

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ABSTRACT

Selfish incentives typically outperform prosocial incentives. However, this research identifies a context where prosocial incentives are more effective: customer referral programs. Companies frequently offer "selfish" incentives to customers who refer, incentivizing those customers directly for recruiting friends. However, companies can alternatively offer "prosocial" incentives that reward the referred friend instead. In multiple field and incentive-compatible experiments, this research finds that prosocial referrals, relative to selfish referrals, result in more new customers. This pattern occurs for two reasons. First, at the referral stage, customers expect to receive reputational benefits when making prosocial referrals within their social network, thereby boosting performance of prosocial referrals. Second, at the uptake stage, the burden of signing up is high, and therefore referral recipients prefer to receive an incentive themselves. Due to the combination of reputational benefits at the referral stage and action burdens at the uptake stage, prosocial referrals yield more new customers overall. The high frequency of selfish referral offers in the marketplace suggests these forces play out in ways that are unanticipated by marketers who design incentive schemes.

Keywords: incentives, prosocial behavior, judgment and decision-making, referral rewards

From evolutionary biology to neoclassical economics, many theories of human behavior posit that humans are driven primarily by self-interest. The most effective incentives should therefore be those that maximize material payoff to the decision maker. Indeed, selfish incentives outperform prosocial (or "other-benefitting") incentives in many contexts: for most reward magnitudes people exert more effort when offered selfish incentives compared to prosocial incentives that go to charity (DellaVigna and Pope 2016; Imas 2014; Schwartz, Keenan, Imas, and Gneezy, 2018).

However, people also frequently display significant other-regarding behavior. In dictator games, even when there is no consequence for selfish behavior, people share on average about 25% of a given endowment (Forsythe et al. 1994). Consumers often pay more for charity-linked products (Elfenbein and McManus 2010; Jung et al. 2017), or choose brands that make a donation over those that provide equivalent discounts (Strahilevitz 1999).

A desire to appear generous to others is one important driver of such prosocial acts. When generous behavior is public, people are more likely to give than when it is private (Andreoni and Petrie 2004; Bereczkei, Birkas, and Kerekes 2007) and anonymous donations are rare (Glazer and Konrad 1996). Any reputational benefits for generous behavior have the potential to loom largest within one's social network. People are more generous in contexts involving their close social connections (Moore 2009; Small and Simonsohn 2007), potentially due in part to a desire for their social connections to view them favorably.

In this project, we examine how social connections alter the dynamics of incentivized behavior. For important theoretical reasons, academic research typically examines prosocial incentives by offering rewards that aid anonymous individuals or charities (DellaVigna and Pope 2016; Eckel and Grossman 1996; Imas 2014; Yang, Hsee, and Urminsky 2014). However, when

people consider prosocial acts in the real world, the benefits often go to people whom they know. In this research, we propose that incorporating social ties into the context of incentive design substantially alters behavior, and does so in ways that are not obvious to incentive architects. Specifically, we examine the context of customer referral programs where companies incentivize customers to refer members of their social network to become new customers.

PROSOCIAL REFERRALS OFFER REPUTATIONAL BENEFITS

There are numerous examples of self-benefiting financial incentives that effectively motivate behavior. Self-benefiting financial incentives increase gym attendance (Acland and Levy 2015), improve immunization coverage (Banerjee et al. 2010), and motivate weight loss (John et al. 2011). In direct comparisons, selfish incentives (particularly those above $1) more effectively motivate effort than equivalent prosocial incentives that benefit charity (Imas 2014; Schwartz et al. 2018). Similarly, people report greater happiness when they receive a selfish incentive compared to when an equivalent donation is made in their name (i.e., when they receive a prosocial incentive; Berman and Small 2012).

However, as Miller (1999) states, "Homo economicus, it should not be forgotten, inhabits a social world." When people behave generously, they may sacrifice at a material level, but they often receive social rewards in return such as higher status or respect (Berman et al. 2015; Flynn 2003; Flynn et al. 2006; Price 2006). Reputational rewards motivate people to behave generously due to a strong desire for social approval (Ariely, Bracha, and Meier 2009; Grant and Gino 2010) and a fundamental human need to belong and maintain close personal relationships (Baumeister and Leary 1995). Considerable experimental evidence suggests that prosocial behavior is frequently driven by such reputational concerns (Fehr and Fichbacher 2002). For example,

generosity increases when donors are promised recognition for their contributions (Alpizar, Carlsson, and Johansson-Stenman 2008; Andreoni and Petrie 2004; Fisher and Ackerman 1997), potentially explaining why anonymous donations are rare (Glazer and Konrad 1996). Church donations increase when anonymity is reduced (and reputational benefits are enhanced), such as when closed donation bags are replaced with open baskets (Soetevent 2005). In a related vein, charitable appeals that emphasize benefits to others are more effective when concerns about one's reputation are high (White and Peloza 2009).

Reputational benefits for prosociality are likely to be especially strong motivators in contexts where people interact with members of their social network. Indeed, people tend to be more motivated to help friends than strangers (Moore 2009; Schlenker and Britt 1999). For example, on online dictator games involving participants' social networks, adult participants sent significantly more money to their close friends than to strangers (Leider et al. 2009). Individuals are also more likely to be generous (e.g., volunteer) for a cause when they have a close personal relationship with someone affected by that cause (Small and Simonsohn 2008). Even young children are willing to sacrifice (receive one sticker instead of two) to benefit a friend, but will not similarly sacrifice to benefit a stranger (Moore 2009; see also Fehr, Bernhard, and Rockenbach 2008). Because people care deeply about the judgments of those with whom they have personal relationships, prosocial incentives have the potential to perform well when offered within social networks.

CUSTOMER REFERRAL INCENTIVES

We study the role of social connections in incentivized behavior within the context of customer referrals. In referral programs, companies typically offer incentives to existing

customers for recruiting new customers. For example, Google Apps currently offers $15 to customers for each new user they recruit, and the videogame World of Warcraft offers current users a free month of gaming if they successfully refer their friends to buy a subscription (Gains 2017). Referral programs can be a cost-efficient method for gaining new customers (Ryu and Feik 2007; Schmitt, Skiera, and Van den Bulte 2011). Referral programs not only recruit new customers, but referred customers tend to be high in value because those customers feel greater trust and a stronger bond with firms when a friend or acquaintance is already a customer (Castilla 2005; Fernandez, Castilla, and Moore 2000; Schmitt et al. 2011). Such social connections that exist within the referral context are a key component of this research.

A critical feature to consider when creating referral incentive programs is that a new customer conversion involves two separate decisions: the referral decision and the uptake decision. "Selfish" referrals (those that reward the referrer) may appear superior because they incentivize the first decision maker, and the process has no chance to begin if there is no referral (Bapna et al. 2014). Many firms focus on this feature. Observational data collected by a hypothesis-blind research assistant found that, of 351 existing referral incentive programs documented on-line, 40.5% offered selfish referrals while only 2.6% offered prosocial referrals (55% offered rewards that were shared between the referrer and recipient). Therefore, while some companies use purely prosocial referrals, fifteen times as many use rewards that solely benefit the referrer.

The popularity of selfish referral programs indicates that incentive architects tend to focus heavily on encouraging current customers to refer. However, recipients must also have sufficient motivation to sign up in order for the referral to ultimately be successful. Referral structures that

start as prosocial from the referrer's point of view offer a direct incentive for the recipient to sign up.

ASYMMETRIC ACTION COSTS IN CUSTOMER REFERRALS

An important feature of the two-step referral process is that there tends to be a substantial asymmetry in the burden of acting between the referrer and the recipient. The act of referring tends to be low effort and low cost: the referrer simply sends their friend a code or submits an email address. Recipients, however, tend to incur substantially higher burdens; to complete a referral, recipients must spend money on a product, download an app, or join a service (and receive the accompanying e-mails, notifications, etc.; see Figure 1).

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Insert Figure 1 about here

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This difference in action costs has the potential to influence the effectiveness of prosocial versus selfish incentives at each decision stage. There are typically limits to the sacrifice individuals are willing to make in order to behave prosocially. For example, consumers are willing to pay more for brands that support good causes; however, the extra amount they are willing to pay is small (Strahilevitz 1999). If cause-related products involve price or quality tradeoffs, the positive effect on purchases is often attenuated (Barone, Miyazaki, and Taylor 2000). Similarly, valuing prosocial norms does not lead to prosocial behavior when the prosocial behavior has a sufficiently high cost (Schwartz 1977). For example, in one series of studies, students received moral appeals to conserve energy, which varied the salience of personal cost.

Conservation intent increased only for those students who did not perceive high personal costs of conservation (Tyler et al. 1982).

We predict that action costs will play an important role in the preference for prosocial versus selfish incentives in the context of customer referrals. Specifically, at the referral stage, prosocial referrals have the potential to outperform what has been shown by past research, because there is a minimal burden for referring, and the incentive is offered within the referrer's social network. At the uptake stage, however, the burden of action is higher and recipients may therefore require a self-benefiting incentive to become a new customer.

THE CURRENT RESEARCH

While self-benefiting incentives have proven highly effective at motivating behavior across many contexts, we predict that in the context of customer referrals, prosocial referral incentives may outperform selfish referral incentives. We predict this pattern because: 1) at the referral stage, the cost of action is low and customers who refer friends receive reputational benefits when making prosocial referrals, and 2) at the uptake stage, the cost of action is high; therefore, referral recipients will be more likely to require a direct incentive to follow through. We expect to find that reputational benefits and action costs both have an important influence on incentivized behavior, such that prosocial referrals designed to incentivize the recipient will result in the greatest number of new customers.

We examine the effectiveness of prosocial and selfish referral structures across seven studies (Please see Table 1 for an outline of all studies). Study 1 is an initial field experiment with a phone app company that varies incentive structure and measures new customer conversions. Results show that prosocial referrals more effectively recruit new customers (lead

to more app downloads) than selfish referrals. Study 2 is another field experiment, this time with a video game rental company. Study 2 replicates the findings from Study 1 and also tracks behavior at each decision stage (both referral and uptake stages), showing that prosocial referrals perform as well as selfish referrals at the referral stage, and prosocial referrals (which benefit the recipient) substantially outperform selfish referrals (which benefit the referrer) at the uptake stage. Study 3 replicates the field experiment findings in a fully incentivized lab experiment and uncovers process evidence regarding the important role of reputational benefits at the referral stage. The role of reputational benefits at the referral stage is further supported by Studies 4A and 4B, which find that prosocial incentives less effectively motivate referrals when reputational benefits are removed or reduced. Finally, Studies 5A and 5B find that the asymmetric burden of taking action between the referral and uptake stages explains the different effect of self-benefitting versus other-benefitting incentives at each stage. Specifically, referring is typically low cost and low effort and consumers are therefore equally likely to refer their friends when offered a prosocial or selfish incentive at the referral stage. However, uptake often involves higher cost and burdens (e.g., buying a product or service), and therefore recipients are more likely to follow through on a referral when they receive a direct incentive themselves for doing so.

Following recommendations from Simmons, Nelson, and Simonsohn (2012), we report all manipulations and all measures for all studies.

STUDY 1: PROSOCIAL REFERRALS LEAD TO MORE NEW CUSTOMER CONVERSIONS

Study 1 is a field experiment with a startup company called GiftAMeal that offers a food photo-sharing phone app. In this experiment, we test how various incentive structures influence new customer conversions.

Methods

The company e-mailed 6,364 current customers, asking if each customer would refer their friends to download the app. Customers were randomly assigned to one of four experimental conditions: 1) control: no monetary incentive[1], 2) selfish: customers received a $5 Amazon gift card for each friend who downloaded the app, 3) prosocial: referred friends received a $5 gift card if they downloaded the app, 4) shared: referrer and their friend each received a $2.50 gift card if the friend downloaded the app or 5) donation: GiftAMeal donated $5 to Feeding America for each download.

Current customers received a unique promotional code, which they could send to their friends. All emails additionally offered a suggestion for what customers could email or text their friends when sending the referral (for full emails in all conditions, please see Appendix A), however the company could not track referral and uptake decisions directly. The promotion lasted two weeks, during which time referred individuals could download the app using their friend's code. In this study, the company tracked total new customer downloads (i.e., conversions) by condition.

Results

Table 1 summarizes the results. Overall, the total rate of new app downloads was low (less than 1% overall), not uncommon in field settings. Nevertheless, we were able to detect

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[1] While there was no monetary incentive, in the control condition, the company donated a meal to a family in need.

significant differences between experimental conditions. Referrals were more successful (resulted in more new customers) when existing customers were offered a prosocial incentive (.94% conversion rate) than when they were offered no incentive (.08% conversion rate; $\chi^2(1) = 9.41$, $p = .002$), or when they were offered a donation incentive; (.08%; $\chi^2(1) = 9.29$, $p = .002$). The prosocial referral also had a marginally significant advantage over the selfish referral (.39%; $\chi^2(1) = 2.92$, $p = .09$). There was no difference in the number of successful referrals between the prosocial and shared referral conditions (.94%; $\chi^2(1) = .002$, $p = .99$). Finally, the selfish referral performed marginally significantly better than the Control condition ($\chi^2(1) = 2.69$, $p = .10$; see Figure 2).

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Insert Table 1 about here

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Discussion

Results from Study 1 are consistent with the prediction that prosocial referrals will result in more new customers compared to offering either 1) no incentive or 2) an incentive that only benefits the referrer. The company gained the same number of new customers in the two conditions where a friend would receive at least part of the incentive (prosocial and shared referral conditions). Both of these conditions significantly outperformed the control (no financial incentive) condition and marginally significantly outperformed the selfish referral condition. Further, both the prosocial and shared conditions outperformed another version of an other-

benefiting referral where the incentive would be given to a charity, yet offered no incentive for a member of one's social network. This result is consistent with past research (Imas 2014; Schwartz et al. 2018) and also suggests that prosocial referrals are not necessarily successful because they offer customers a chance to be generous, but because being generous within one's social network and/or providing the recipient with a direct financial incentive to sign up matter.

Study 2 aims to replicate and extend these findings by tracking behavior at both the referral and uptake decision stages in addition to measuring total new customer conversions in another field experiment.

STUDY 2: PROSOCIAL VERSUS SELFISH REFERRALS AT BOTH THE REFERRAL AND

UPTAKE STAGES

Study 2 is another randomized field experiment, this time with an online video game subscription company called Game Access. This company's tracking abilities allowed decision tracking at both the referral stage (tracking how many original customers referred) and uptake stage (tracking how many newly referred recipients signed up).

Methods

The company randomly assigned 1,500 customers to receive one of three referral offers: 1) control: no incentive, 2) selfish: one month free, or 3) prosocial: one month free for the new customer. Of the 1,500 emails sent, 1,438 were successfully delivered. Current members received an email asking if they would refer a friend to buy a membership to Game Access (See Appendix A for all emails used in this experiment).

If a current customer chose to refer a friend, they clicked a link in the email labeled "Tell your friends about Game Access," and then entered the name and email address of as many

friends as they would like. Game Access then sent an email to each referred friend with the

subject line "I just joined a cool new service." By sending emails directly to referral recipients,

the company was able to track both how many customers sent referrals as well as how many

recipients chose to follow through on those referrals by signing up.

Results

Table 1 summarizes the results.

Referral stage. Customers in the selfish (25.91%) and prosocial (28.22%) conditions

were more likely to refer a friend than were those in the control condition (17.79%, $\chi^2(1) = 9.24$,

$p < .01$ and $\chi^2(1) = 14.91$, $p < .001$, respectively). The two incentive conditions were equally

effective at motivating customers to refer ($\chi^2(1) = .64$, $p = .42$; see Figure 3A).

Uptake stage. At the uptake stage, referral recipients were significantly more likely to

sign up in the prosocial condition (16.91%, 23 out of 136 referral recipients) compared to the

selfish condition (6.61%, 8 out of 121 referral recipients, $\chi^2(1) = 6.38$, $p = .01$) or control

conditions (3.45%, 3 out of 87 referral recipients, $\chi^2(1) = 9.29$, $p < .01$). There was a non-

significant difference in new customer uptake between the selfish and control conditions ($\chi^2(1) =$

1.00, $p = .32$; see Figure 3B).

New customer conversions. As with the previous field experiment, the final new customer

conversion rate was higher when the company offered a prosocial referral (4.77%) compared to a

selfish referral (1.71%, $\chi^2(1) = 7.03$, $p = .008$) or no incentive (.61%, $\chi^2(1) = 16.12$, $p < .001$;

see Figure 3C). There was a non-significant, though directional, difference in conversion rate

between the selfish and control conditions ($\chi^2(1) = 2.55$, $p = .11$).

One-month follow-up. Follow-up subscription renewal data showed that the new

customer conversion rate patterns remained consistent one month later. There were more new

customers that renewed their membership in the prosocial condition (3.52%) compared to the selfish condition (1.07%, $\chi^2(1) = 6.29$, $p = .01$) or the control condition (.35%, $\chi^2(1) = 9.41$, $p < .001$). There continued to be a non-significant difference between the selfish and control conditions ($\chi^2(1) = 1.78$, $p = .18$).

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Insert Figure 3 about here

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Discussion

Study 2 provided additional support for the central hypothesis: prosocial referrals outperform selfish ones. This field experiment showed that, despite the tendency for selfish incentives to outperform prosocial incentives in most settings, the prosocial incentives perform equally as well as selfish incentives in this context at the referral stage. Further, the prosocial referral (which benefits the recipient) is substantially more effective at the uptake stage. We propose that this pattern occurs because, at the referral stage, the burden of referring is low and referrers anticipate reputational benefits from sending their friends an incentive opportunity. Therefore, we see that a prosocial referral performs equally as well as a selfish referral at the referral stage. At the uptake stage, however, there is a much higher burden (purchasing a $30/month membership) for the recipient to follow through on their friend's request. Thus, at the uptake stage, recipients are significantly more likely to sign up when they themselves receive the incentive (i.e., when recipients are in the original prosocial referral condition) than when the incentive goes to the original customer who sent the referral (in the selfish referral condition). Studies 3-5B further explore the process behind these patterns.

STUDY 3: FULLY INCENTIVIZED LAB EXPERIMENT WITH PROCESS MEASURES

Study 3 aims to replicate the patterns observed thus far in a fully incentivized and controlled lab setting. In addition, Study 3 examines the process behind decisions at the referral stage; specifically, why might prosocial incentives be as effective as selfish incentives at motivating referrals? As previously described, we predict that the reputational benefits of sending a prosocial referral improve performance of prosocial incentives at the referral stage compared to what has been observed in previous research when reputational benefits were likely smaller. We also test two additional potential explanations regarding why prosocial and selfish incentives perform equally as well at the referral stage. First, we test the role of psychological costs of sending selfish referrals. That is, it is possible that people feel guilt or discomfort about referring a friend in the selfish referral condition and then receiving an incentive for the friend's actions. Those negative feelings could drive down the likelihood of sending a selfish referral, making them equivalent in success to prosocial referrals. Similarly, we also test the role of perceived social obligations. That is, referrers might anticipate that recipients will find the referral burdensome or annoying. And, such anticipated obligations might be especially high in the case of selfish referrals where the recipient receives no incentive for acting, once again driving down the likelihood of sending selfish referrals and making them equivalent in success to prosocial referrals. We measure each of these constructs at the referral stage in Study 3, and test their relative importance in a simultaneous mediation model.

Methods

At the referral stage, we recruited 369 undergraduate students participated (M_{Age} = 19.64, 47.97% female). Participants were randomly assigned to one of four referral incentive conditions: control, selfish, prosocial, or shared. We first asked participants to provide their first

name. Participants next completed a quick personality quiz, the Ten-Item Personality Inventory (TIPI; Gosling, Rentfrow, and Swann 2003). We next provided participants with a brief report of their real results regarding their extraversion/introversion scores (for full details see Appendix A). Participants were then told that they could refer one other student to take the personality quiz by providing the student's university email address. Participants were given the following information based on incentive condition: 1) control: no incentive 2) selfish: "If your friend takes the survey you will receive a $3 electronic gift card to Starbucks," 3) prosocial: "If your friend takes the survey he or she will receive a $3 electronic gift card to Starbucks," or 4) shared: "If your friend takes the survey you will each receive a $1.50 electronic gift card to Starbucks."

Participants then viewed the email that their friend would receive if they chose to refer. In the control and selfish conditions, the e-mail subject line was "[Participant First Name] thought you would enjoy this survey!" In the prosocial and shared conditions, the subject line stated, "[Participant First Name] thought you would enjoy this survey (plus get a Starbucks gift card)!" The email was identical in all conditions and explained that their friend had taken a quick personality quiz as part of a study and wanted to share the link with them. However, in the prosocial and shared conditions, it also stated, "If you take the quick survey, you will receive a $3 ($1.50) electronic gift card to Starbucks."

We then asked participants, "Would you like to refer a friend to take this personality quiz?" and told them that they would need to provide their own student ID (requested for accounting reasons), their own student email address, and one friend's student email address, which they could look up in the online directory. Participants chose either "Yes, I would like to refer a friend" or "No, I would not like to refer a friend." Participants who chose not to refer moved

directly to the follow-up questions, whereas participants who chose to refer filled out the information described above about their friend before continuing to the follow-up questions.

We included several follow-up questions about reputational benefits, psychological costs, and social obligations to explore the process underlying these referral decisions. The reputational benefit questions included, "How would your friend view you if you made this referral?" (Generous, Helpful, Friendly, Well-Intentioned, Trustworthy, Warm, Good-natured, Likeable, Sincere; 1 = Not at all, 7 = Very much; α = .96) We also asked questions about psychological costs: "How would you feel if you made this referral?" (Selfish, Deceitful, Guilty, Uncomfortable, Sneaky, Conflicted; 1 = Not at all, 7 = Very much; α = .89). Finally, we measured perceptions of imposing a social obligation using the following items: "How much would you feel like you are imposing on [friend] by sending this referral?", "How annoyed would [friend] be about receiving this referral?", and "[Friend] would feel that I am taking advantage of him/her" (1 = Not at all, 7 = Very much so; α = .72). While we primarily discuss process results comparing the selfish and prosocial referral conditions in the main text, process results for all conditions are reported in Appendix B.

For the uptake stage, we sent the emails shown to the original participants to each of the referred friends (N = 186). Referred friends received the email and could choose whether to take the personality quiz. One week after sending out the emails, participants were compensated according to their condition and whether or not their referred friend took the survey.

Results

Table 1 summarizes the results.

Referral stage. Consistent with Study 2, participants were equally likely to refer in the selfish (64.84%), prosocial (58.06%), and shared conditions (56.99%; χ^2 (2) = 1.38, p = .50).

Participants were more likely to refer a friend in all incentive conditions compared to the control (no incentive) condition (26.37%; all $ps < .001$; Figure 4A).

Referral process items. Participants felt that the reputational benefits of referring were higher in the prosocial condition ($M_{Prosocial} = 4.41$, SD = 1.33) than the selfish condition ($M_{Selfish} = 3.69$, SD = 1.34; t(182) = -3.64, $p < .001$). We found similar results for the alternative mediators. Participants reported higher psychological costs in the selfish condition ($M_{Selfish} = 2.48$, SD = 1.32) compared to the prosocial condition ($M_{Prosocial} = 1.75$, SD = 1.17; t(182) = 3.98, $p < .001$). Participants also reported that the social obligation was marginally significantly higher in the selfish condition ($M_{Selfish} = 2.98$, SD = 1.34) compared to the prosocial condition ($M_{Prosocial} = 2.65$, SD = 1.36; t(182) = 1.68, $p = .096$).

Though the total effect of referral incentives on referral choice is not detectably different from zero (the selfish and prosocial incentives lead to equal referrals), mediation can still be present. As Hayes (2009) explains, a total effect is the sum of different paths of influence, and these paths may cancel each other out, producing a total effect that is not detectably different from zero (for more discussion on this topic, see: Zhao, Lynch, and Chen 2010). Therefore, while the direct financial incentive is likely increasing referrals for those in the selfish condition compared to prosocial condition, we propose that there is an opposing influence of reputational benefits increasing referral choice for the prosocial condition. Using methods prescribed by Hayes (2009) we simultaneously tested the significance of all three measured mediators by calculating standardized indirect effects for 10,000 bootstrapped samples and found that reputational benefits mediate the effect of referral type on referral choice. We found a statistically significant indirect effect of reputational benefits (.34; 95% CI [.11, .71]). The indirect effect of psychological costs was not significant (.09; 95% CI [-.45, .14]) nor was the

indirect effect of imposing a social obligation (.25; 95% CI [-.03, .64]). These results are consistent with the notion that, while the lack of personal incentive likely decreases motivation to refer in the prosocial condition, prosocial (vs. selfish) referrals lead to an increased expectation of reputational benefits, which in turn increases referrals in the prosocial condition compared to what would be expected based on previous research about prosocial incentives.

Uptake stage. At the uptake stage, referral recipients were significantly more likely to follow through on the referral in the prosocial condition (69.81%; see Figure 4B), compared to the selfish (28.07%, $\chi^2(1) = 41.74$, $p < .001$) or control conditions (24%, $\chi^2(1) = 14.23$, $p < .001$). There was a non-significant difference in new customer uptake between the prosocial and shared conditions (64.71%, $\chi^2(1) = .30$, $p = .58$). There was also a non-significant difference between new customer uptake in the selfish and control conditions ($\chi^2(1) = .15$, $p = .70$; we note that recipients in the control and selfish conditions received identical e-mails in this study, making the lack of difference unsurprising. We also note that in Study 2, recipients did receive information that their friend (the referrer) would receive an incentive in the selfish referral condition, information that we continue to include for recipients in studies 5A and 5B).

New customer conversions. Consistent with Studies 1 and 2, the overall conversion rate was higher in the prosocial condition (39.79%, Figure 4C) than the selfish condition (17.58%,, $\chi^2(1) = 12.91$, $p < .001$). There was a non-significant difference between the prosocial and shared conditions (35.48%, $\chi^2(1) = .38$, $p = .54$). The control condition was significantly less effective at bringing in new customers than any incentive condition (6.52%, $\chi^2(3) = 35.78$, $p < .001$).

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Discussion

Consistent with Studies 1 and 2, the prosocial referral was more than twice as effective as the selfish referral at recruiting new customers, and more than five times as effective as the control (no incentive) condition.

Also consistent with Study 2, we once again see that prosocial and selfish incentives are equally effective at the referral stage. Process evidence finds that anticipated reputational benefits when making prosocial referrals increase performance of this prosocial incentive compared to what would otherwise be expected. That is, reputational benefits allow prosocial incentives to perform equally as well as selfish incentives at the referral stage, even though without these reputational benefits, they would perform worse. These results provide evidence that prosocial and selfish incentives can be competitive at the referral stage, because even though the selfish incentive provides a direct financial benefit to the referrer, consumers believe the prosocial incentive will provide a reputational benefit, increasing prosocial referrals. Although other potential process constructs such as psychological costs and social obligations vary between prosocial and selfish referral conditions, they do not appear to account for the influence of referral type on referral choice like reputational benefits do. We further explore the effect of reputational benefits at the referral stage in Studies 4A and 4B.

STUDIES 4A AND 4B: REFERRALS AND REPUTATIONAL BENEFITS

In Studies 4A and 4B, we examine the role of reputational benefits in the performance of prosocial incentives at the referral stage. In Study 4A, we vary reputational benefits by making the source of the referral known to the recipient (allowing high reputational benefits) versus unknown (i.e., anonymous) to the recipient (prohibiting reputational benefits). In Study 4B, we

vary reputational benefits by changing the relationship closeness of the recipient: specifically, we vary whether the referral recipient is a friend (allowing for high reputational benefits) or a stranger (allowing for minimal reputational benefits).

STUDY 4A: PROSOCIAL INCENTIVES ARE LESS EFFECTIVE WHEN THE REFERRAL IS ANONYMOUS

Study 4A tested the role of reputational benefits in the effectiveness of prosocial referral incentives. Specifically, we test whether making referrals anonymous decreases the benefits of prosocial incentives. If anticipated reputational benefits drive the appeal of prosocial incentives at the referral stage, then removing those benefits via making the referral anonymous should decrease prosocial referrals.

Methods

As outlined in our pre-registered research plan (available at https://osf.io/h6rx5/), we recruited 800 MTurk participants (805 participants completed the study; $M_{Age} = 36.75$, 53.18% female). The study used a 2(referral: selfish vs. prosocial) x 2(named vs. anonymous) between-subjects design. Participants were asked to give their first name and then, in the friend conditions, the first name of a close friend. We then asked participants to imagine the following scenario, "Amazon has released a new, free loyalty program called Amazon BOLD that showcases new products to program members. You joined the program and think it has been great." Participants were next told that Amazon has a referral program that gives either a 1) selfish incentive: Participants were told they will receive a $10 Visa gift card for each individual they refer or 2) prosocial incentive: participants were told that every individual they refer will

receive a $10 Visa gift card. However, in the anonymous condition, participants were also told that the referral would be anonymous and their friend will not be told who sent it (for all study materials, see Appendix A). Participants were then required to correctly identify who would receive an incentive (themselves or their friend) before they could move to the referral decision to confirm that they understood the incentive structure. Finally, we asked participants, "Would you refer your friend to Amazon BOLD"? (Yes/No).

Results

Table 1 summarizes the results. We performed a binary logistic regression on choice to refer as a function of referral anonymity, referral type (selfish/prosocial), and their interaction. This analysis yielded a significant interaction of anonymity and referral type (Waldχ^2 (1) = 6.00, p = .014, Figure 5). For participants in the control condition, we observed an equal number of referrals for the prosocial (87.32%) and the selfish referral conditions (85.29%; Waldχ^2 (1) = .35, p = .55). However, when the referral was anonymous, the selfish referral (86.50%) was significantly more successful than the prosocial referral (74.49%; Waldχ^2 (1) = 8.87, p = .003, Figure 5). An additional study replicated this pattern; see Appendix C – Study 1.

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Insert Figure 5 about here

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Discussion

Study 4A finds that prosocial referrals become less effective when the ability to inform friends of one's prosocial act are reduced, providing evidence that reputational benefits are a key motivator at the referral stage. We note that if psychological costs (i.e., discomfort or guilt due to profiting from a friend with a selfish referral incentive) or concerns about social obligations (i.e.,

imposing upon one's friend with a selfish request) were primarily responsible for the performance of prosocial incentives at the referral stage, we should see minimal change in prosocial referral decisions when the referral is anonymous.

STUDY 4B: PROSOCIAL INCENTIVES ARE LESS EFFECTIVE WHEN THE RECIPIENT IS A STRANGER

Study 4A measures the performance of prosocial versus selfish incentives at the referral stage when reputational benefits are varied by describing the recipient as either a friend or a stranger. We expect that because the potential for reputational benefits is substantially reduced when the recipient is a stranger (instead of a friend), the performance of prosocial referrals will decline relative to selfish referrals in this case.

Methods

As outlined in our pre-registered research plan (available at https://osf.io/drhvt/), we recruited 800 MTurk participants (810 participants completed the study; $M_{Age} = 35.91$, 61.54% female). The study used a 2(referral: selfish vs. prosocial) x 2(referral recipient: friend vs. stranger) between-subjects experimental design. . We used the same context as in Study 4A (Amazon BOLD referral), and the same incentive (a $10 Visa gift card). All participants were asked to give their first name and the first name of a close friend. We showed participants a sample referral email that Amazon was interested in sending to either 1) their close friend or 2) "a potential customer" (whom the participant does not know). In both conditions, we used the participant's name in the sample email (e.g., One of our customers, Rosie, has been using our new loyalty program, Amazon BOLD, and wanted to share the savings with you!). Participants

were then required to correctly identify who would receive an incentive (themselves or the recipient) before they could move to the referral decision to confirm that they understood the incentive structure. We then asked, "Would you refer your friend [name of close friend inserted]/this potential customer, to Amazon BOLD"? (Yes/No).

Results

Table 1 summarizes the results. A binary logistic regression was performed on the choice to refer as a function of referral recipient type (friend/stranger) and incentive type (selfish/prosocial). This analysis yielded a significant interaction of recipient and incentive type (Waldχ^2 (1) = 14.85, $p < .001$, Figure 6). For participants in the friend condition, we observed an equal number of referrals for the prosocial (87.75%) and the selfish referral (87.00%, Waldχ^2 (1) = 0.05, $p = .82$). This pattern is consistent with results from studies 2 and 3. However, when referring a stranger, the selfish incentive (82.76%) was significantly more successful than the prosocial incentive (54.73%, Waldχ^2 (1) =35.78, $p < .001$), consistent with standard incentivized behavior. An additional study replicated this pattern; please see Appendix C – Study 2 for details.

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Insert Figure 6 about here

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Discussion

Consistent with Studies 2 and 3, participants were equally likely to refer for prosocial versus selfish incentives when the referral recipient was a close social tie (a friend). However, when the referral recipient was a stranger, the selfish referral was significantly more effective than the prosocial referral, consistent with patterns from previous research. This suggests that

prosocial incentives are not effective due to a general tendency toward other-regarding behavior. Instead, prosocial referrals become competitive with selfish referrals only when the recipient and referrer share a personal relationship.

Studies 4A and 4B demonstrated that, in the absence of reputational benefits, selfish incentives typically outperform prosocial ones. In these two studies, we observe that in a typical customer referral setting, which includes reputational benefits when offering an incentive to a friend, selfish and prosocial incentives are equally effective at the referral stage. However, when we reduce or remove reputational benefits, such as when the referral recipient is a stranger or when the referral is anonymous, selfish incentives become more effective. This lends support to the hypothesis that, due to the presence of social connections and corresponding reputational concerns, customer referral decisions provide a unique context in which prosocial incentives perform as well as selfish ones.

STUDIES 5A AND 5B: HIGHER ACTION COSTS INCREASE IMPORTANCE OF SELF-BENEFITING INCENTIVES

Studies 5A and 5B demonstrate the role of action costs on self-benefiting versus other-benefiting incentives. We hypothesize that at the referral stage, prosocial incentives tend to perform as well as selfish incentives because 1) making a prosocial referral creates reputational benefits and 2) referring is a low-cost action. Action at the uptake stage, however, tends to impose a higher cost (buying a product, signing up for a service, etc.). Therefore, personal financial benefits may be more important for increasing recipient follow-through at this uptake stage. Study 5A manipulates uptake cost at the recipient stage to see if minimizing this cost increases the effectiveness of other-benefiting incentives. Study 5B then tests this hypothesis by

directly comparing the recipient and referral stages within the same context and measuring perceived burden of taking action at each stage.

STUDY 5A: UTPAKE COSTS

Study 5A tests whether prosocial referrals continue to outperform selfish referrals at the recipient uptake stage when uptake costs are set very low. We predict that recipients prefer self-benefiting incentives when there is a large burden for following through on a referral, but this should no longer be the case if the burden of uptake is very low.

Methods

As outlined in our pre-registered research plan (available at https://osf.io/pvzqm/), we recruited 800 MTurk participants; 740 met our pre-registered conditions of both completing the dependent variable and using a unique location (M_{Age} = 35.95, 56.22% female).

To understand the role of action costs at the uptake stage of the referral process, we had participants imagine that a friend sent them an email asking if they would like to try a (fictitious) food delivery service called Food2Me that delivers from local restaurants. Participants provided their own first name and the first name of a close friend. We manipulated whether the referral was prosocial (the recipient/participant would receive an incentive) or selfish (the referrer/participant's friend would receive an incentive). In both conditions, the incentive was a $20 Amazon gift card. We also manipulated action costs by varying the effort required to sign up for the service. Specifically, participants in the low-cost condition read, "This is an exclusive offer - to verify that only one person uses this offer, **simply click this unique link** to sign up: Food2Me.com/xyq6msp204." Those in the high-cost condition read, "This is an exclusive

offer - to verify that only one person uses this offer, **print out the attached documents, fill**

them out, and mail them to the Food2Me headquarters with your

unique code: xyq6msp204." To make the effort required in the high-cost condition even more

salient, we additionally had these participants click through a step-by-step process of what would

be required to sign up for the service. For emails used in all conditions, see Appendix A (full

survey can be found at our open science link).

Participants then answered the question, "Would you sign up for the Food2Me delivery

service?" Participants could respond either "Yes, I would sign up for the Food2Me delivery

service" or "No, I would not sign up for the Food2Me delivery service."

Note that, as in Study 2, we told participants (recipients) in the selfish referral conditions

that the friend who referred them would receive a reward if they followed through on the

referral. We informed participants of this benefit to their friend to examine whether, even when

recipients know that their friend will receive an incentive (which is not always the case in these

incentive designs), selfish referrals have a minimal positive effect at the uptake stage due to the

higher burden of follow-through. We additionally measured reputational benefits (How would

your friend view you if you chose to join Food2Me through this referral?" - Generous, Helpful,

Friendly, Well-Intentioned, Trustworthy, Warm, Good-natured, Likeable, Sincere; 1 = Not at all,

7 = Very much; $\alpha = .96$).

Participants were required to correctly identify who would receive an incentive

(themselves or their friend) and what was required in order to sign up (click a link or print out

documents and mail them in) before they could move to the uptake decision to confirm that they

understood the incentive structure and action costs. Finally, as a manipulation check, we

measured action costs ($\alpha = .81$).

Results

    Manipulation Check. As expected, there was a significant main effect of the action cost manipulation; the high cost condition was perceived as having higher action costs than the low cost condition ((F(1, 739) = 311.40, $p < .001$). There was also a significant main effect of referral incentive type (F(1, 739) = 5.26, $p = .022$). There was a non-significant interaction of action cost and incentive type (F(1, 739) = .19, $p = .67$). In the high cost condition, perceived action costs were significantly lower for the prosocial referral ($M_{Prosocial} = 4.53$, SD = 1.35) than the selfish incentive ($M_{Selfish} = 4.83$, SD = 1.43; t(361) = 1.97, $p = .05$). In the low-cost condition, there was a non-significant difference in perceived action costs ($M_{Selfish} = 2.92$, SD = 1.56 vs. $M_{Prosocial} = 2.72$, SD = 1.37; t(375) = 1.29, $p = .20$).

    Uptake decision. Table 1 summarizes the results. We performed a binary logistic regression on uptake decision as a function of uptake cost (high/low) and referral type (selfish/prosocial). This analysis yielded a significant interaction of uptake cost and incentive type (Waldχ^2 (1) = 9.21, $p = .002$, Figure 7). For participants in the high-cost condition, we observed more sign-ups for the prosocial referral (32.20%) than the selfish referral (15.59%, (Waldχ^2 (1) = 21.42, $p < .001$), consistent with Studies 2-3 as well as typical incentivized behavior. However, when uptake cost was low, there was no difference in uptake choice by those in the prosocial condition (55.90%) versus the selfish condition (54.40%, Waldχ^2 (1) = .86, $p = .77$), consistent with referral choice in previous studies.

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Insert Figure 7 about here

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Reputational Benefits

There was a significant main effect of incentive type on ratings of reputational benefits; participants expected higher reputational benefits for following through on a selfish (vs. prosocial) referral, $(F(1, 739) = 19.90, p < .001)$. Action cost also had a marginally significant main effect on reputational benefits, $(F(1, 739) = 3.64, p = .057)$. There was a non-significant interaction role and incentive type $(F(1, 739) = 2.35, p = .13)$. In the high cost condition, reputational benefits were significantly higher for the selfish referral $(M_{Selfish} = 5.01, SD = 1.38)$ than the prosocial referral $(M_{Prosocial} = 4.72, SD = 1.35; t(361) = 1.97, p = .05)$. Similarly, in the low-cost condition, reputational benefits were higher for the selfish (vs. prosocial) referral $(M_{Selfish} = 5.34, SD = 1.25$ vs. $M_{Prosocial} = 4.76, SD = 1.26; t(375) = 4.46, p < .001)$.

Discussion

Study 5A finds that when the cost of taking action is high, as is often the case at the uptake stage, selfish incentives are a more effective motivator despite recipients expecting higher reputational benefits for other-benefiting incentives. However, when action costs are low, there is no significant difference in the choice to act (follow-through on a referral) when offered a self-benefiting or other-benefiting incentive. An additional study replicated this pattern using the monetary cost of uptake (a $2 service vs. a $100 service) as an alternative manipulation of action costs; please see Appendix C –Study 3.

STUDY 5B: COMPARING REFERRAL VERSUS RECIPIENT STAGES

Study 5B randomly assigned participants to be a referrer or a recipient in the same context, and crossed that manipulation with a prosocial versus selfish referral incentive structure. We also measured action costs at each stage. An interesting feature of the referral context is that decision makers at each stage (the referral and uptake stage) face similar decisions – whether to take action based on an incentive that is offered to you or to your friend; however, we see different decision patterns at the two different stages. At the referral stage, other-benefiting (prosocial) incentives perform equally as well as self-benefiting incentives. At the recipient stage, by contrast, self-benefiting incentives for the recipients (in the prosocial referral condition) outperform other-benefiting inntives for the recipient (in the selfish referral condition). We propose that the higher costs of action at the recipient stage drive the preference for self-benefiting incentives for recipients, and we test this proposition here.

Methods

As outlined in our pre-registered research plan (available at https://osf.io/znuwr/), we recruited 800 MTurk participants (816 participants completed the study; $M_{Age} = 35.40$, 61.81% female). The study used a 2(referral: prosocial vs. selfish) x 2(role: referrer vs. recipient) between-subjects design. For this study, we again described Food2Me (the same food delivery service used in Study 5A). Participants provided their first name and the first name of a close friend. We manipulated whether participants were in the role of referrer or recipient within this paradigm. Participants were informed that they were part of a referral incentive opportunity that was either structured to be selfish (i.e., financially benefitted the referrer) or prosocial (i.e., financially benefited the recipient). In this study, the incentive was a free year of Food2Me.

After reading about the service, participants were required to correctly identify who would receive an incentive (themselves or their friend) before they could move to the action decision to confirm that they understood the incentive structure. Participants were then told, "The Food2Me restaurant delivery service costs $50 per year." They were asked if they wanted to take action; specifically, those in the referrer condition were asked, "Would you refer [Friend's Name] to sign up for the Food2Me delivery service?" and those in the recipient condition were asked, "Would you sign up for the Food2Me delivery service?" Please see Table 2 for a description of each experimental condition.

As a manipulation check, we then measured the costs of action using a three-item scale: "Subscribing to Food2Me would be…" Effortful, Burdensome, Costly (1 = *Not at all*, 7 = *Very much so,* α = .78).

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Insert Table 2 about here

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Results

Manipulation Check. As expected, action costs were perceived to be higher for those randomly assigned to be recipients in this context than referrers ($M_{Referrer} = 3.50$, SD = 1.48 vs. $M_{Recipient} = 2.46$, SD = 1.40; t(811) = -10.31, *p* = < .001).

Action choice. Table 1 summarizes the results. For the purposes of analyses, we coded the incentive as either self-benefiting or other-benefiting from the participant's perspective. We then performed a binary logistic regression on choice to act as a function of participant role (referrer/recipient) and incentive recipient (self/other). This analysis yielded a significant interaction between participant role and incentive recipient (Waldχ^2 (1) = 7.67, *p* = .006, Figure

7). For participants in the referrer condition, we observed marginally significantly more participants choosing to refer for the prosocial (other-benefiting) referral (88.83%) than the selfish (self-benefiting) referral (82.21%; (Waldχ^2 (1) = 3.61, p =.058). However, for participants in the recipient condition, we observed significantly fewer participants choosing to sign up for the selfish referral (i.e., other-benefiting from the recipient's perspective; 51.74%) compared to the prosocial referral (i.e., self-benefiting from the recipient's perspective; 62.19%; Waldχ^2 (1) = 4.46, p =.035). These patterns are consistent with results from studies 2 and 3 at both the referrer and recipient stages. Please see Figure 7 for a visual representation of these findings with referral type coded as "selfish" or "prosocial" to maintain consistency with other studies throughout this paper. An additional study replicated this pattern; please see Appendix C – Study 4.

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Insert Figure 8 about here

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Discussion

Study 5B demonstrates the moderating role of action costs on the effectiveness of prosocial versus selfish incentives. Within the same referral context and design, consumers are similarly likely (in this study, marginally significantly more likely) to take action at the referral stage, where action costs are low, when they are offered a prosocial incentive compared to a selfish incentive. At the recipient stage, however, where action costs are high, recipients are more likely to require an incentive themselves to act.

An additional study replicated the pattern of referral and uptake that we find in Study 5B (see Appendix C – Study 4). This replication study also measured reputational benefits and found that participants in both the referral and recipient roles believed they would receive higher

reputational benefits for taking action (referral or uptake) when offered an other-benefiting incentive. Specifically, there was a significant main effect of incentive type on expected reputational benefits, but participant role did not have an effect on expected reputational benefits (the interaction was also not significant). Therefore, even though both parties expect a reputational benefit for taking action when offered an other-benefiting incentive, recipients (who have high action costs) still show a preference for the self-benefiting incentive.

Studies 5A and 5B provide evidence for the predicted role of action costs on the effectiveness of prosocial and selfish incentives. The results suggest that, in the context of one's social network, when the cost of acting is low (e.g., simply referring a friend), consumers are equally motivated by prosocial versus selfish incentives. However, in the same context, when the cost of acting is high (e.g., following through on a typical referral), consumers are more motivated by self-benefitting incentives. Therefore, when uptake costs are high, which is often true at the recipient stage, companies may benefit from using prosocial referrals that reward the recipient instead of those that reward the referrer.

GENERAL DISCUSSION

People commonly believe that behavior is strongly influenced by self-serving stakes (e.g., monetary incentives; Miller and Ratner 1996; 1998) and research has shown that such incentives can effectively motivate behavior (Schwartz et al. 2018). Much of this research demonstrating the effectiveness of selfish incentives relative to prosocial incentives compares self-benefiting incentives with a contribution to a charity or unknown individual (e.g., Eckel and Grossman 1996; Imas 2014). We find that in a context directly involving one's social ties (customer referrals) prosocial incentives are a powerful motivator and can be equally as powerful as selfish

incentives. In line with previous work, the current research provides evidence that consumers care deeply about their reputations within their social network (Baumeister and Leary 1995). We additionally find evidence that the cost of action plays an important role in the effectiveness of prosocial incentives; when action costs are high, incentives that benefit social network members become relatively less effective than equivalent selfish incentives.

This work builds on research designed to understand how people care about their own versus others' outcomes (Andreoni, Rao and Trachtman 2017; Berman and Small 2012; Dana, Weber and Kuang 2007; DellaVigna, List and Malmendier 2012). We find that when it comes to decisions to refer a friend to a new product or service, people are just as likely to act when offered prosocial versus selfish incentives; however, this high value on the prosocial option is tenuous. If the recipient is not a friend, if the recipient friend does not know the source of the prosocial act, or if the costs of being generous to a friend are high, relative preference for the prosocial incentive declines. In some respects, the fragility of prosocial preferences in this domain reflects a dispiriting pattern, illustrating stark limits and self-serving boundaries of human generosity. However, we also note that in this context, the actors in the exchange have demonstrated no clear need for assistance. Recipient neediness is often cited as individuals' highest prosocial priority (Cryder, Botti, and Simonyan 2017), and is likely to be particularly motivating when occurring within one's social circle (Small and Simonsohn 2007). Therefore, although we find prosocial preferences to exist only narrowly in this context, and potentially without any "pure" altruism (Andreoni 1988; Batson, Early and Salvarani 1997) toward the other person, we expect prosocial preferences to be substantially more robust in other contexts when a clear need for help exists.

In Studies 2 and 3 we also examine the effectiveness of an incentive that is shared between the referrer and the recipient. We find that shared incentives perform equally as well as prosocial incentives at both the referral and uptake stages. Because multiple features change at once when offering a shared incentive, it remains unclear what drives the performance of the shared incentive. One possibility is that including any incentive component that rewards the recipient is sufficient to achieve the performance of the prosocial incentive, even if the size of the recipient's incentive is small. Another possibility is that the smaller incentive size for the recipient pushes down performance of the shared incentive, but offering individuals an opportunity to have a shared experience (a shared incentive in this case) with a member of their social network exerts a positive force back upwards. Additional processes could be contributing to the performance of the shared incentive as well, and future research could attempt to understand exactly what drives the performance of the shared incentive.

From a practical perspective, this research suggests that companies looking to get the largest possible return on their referral investment may want to adopt partly or purely prosocial referral incentive designs to recruit new customers. Despite consistent findings in this research that prosocial referrals outperform their selfish counterparts, selfish referral offers are more than fifteen times more common in marketing practice (please see page 6). These patterns suggest that incentive architects do not have clear insights into the important psychological phenomena at play in this context. Future research could work to uncover the reasons why marketers do not accurately predict incentive dynamics in this, and other related contexts (e.g., competitor referrals; Blanchard, Hada, Carlson 2018), providing conceptual as well as practical insight about other areas where incentive design could be improved.

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FIGURE 1: REFERRAL PROCESS

| Referral Choice (low action costs) | + | Recipient Uptake (high action costs) | = | Successful Conversions |
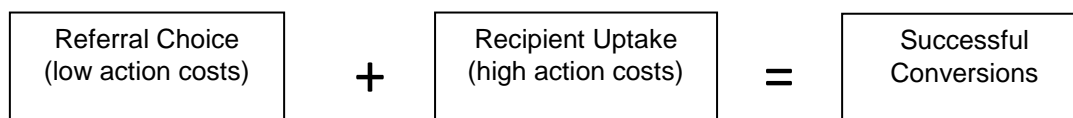
FIGURE 2

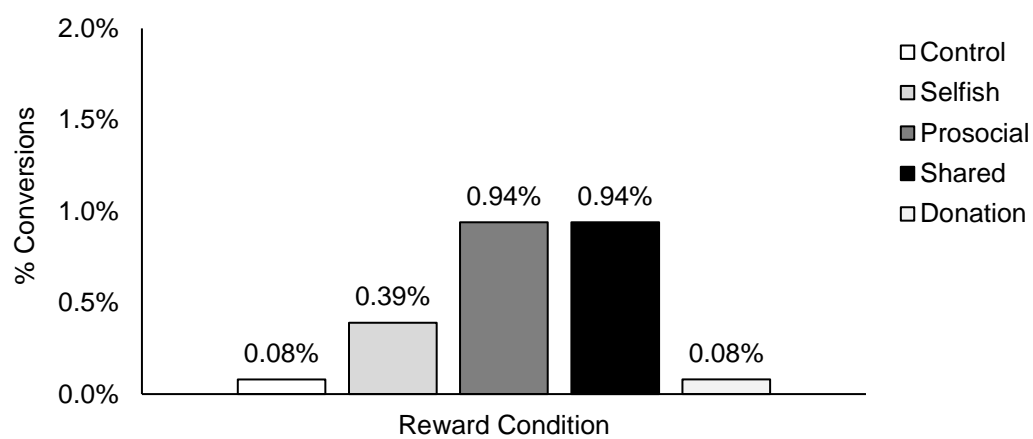STUDY 1: SUCCESSFUL NEW CUSTOMER CONVERSIONS BY CONDITION

Figure 2. Prosocial and shared referrals lead to the most new customer conversions.

FIGURE 3

EXPERIMENT 2: REFERRAL CHOICE (A), RECIPIENT FOLLOW-THROUGH (B), AND
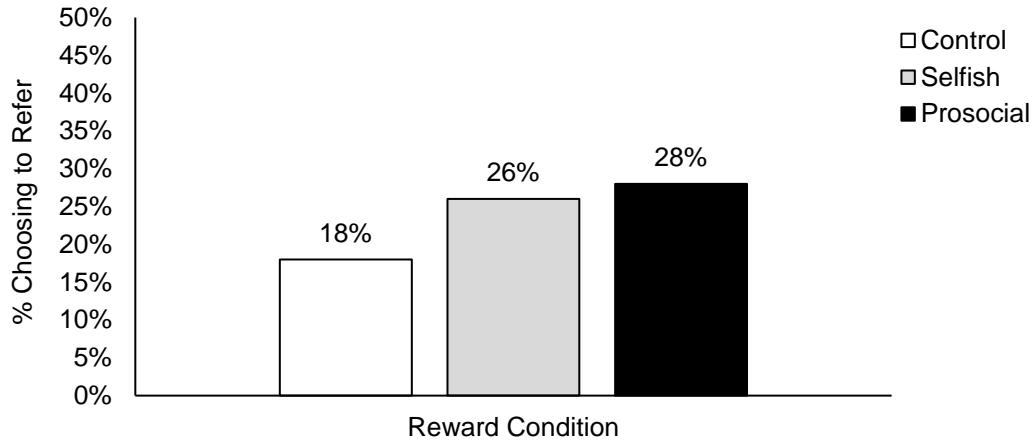OVERALL NEW CUSTOMER CONVERSION RATE (C) BY CONDITION

A.

Figure 3(A). Prosocial and selfish incentives lead to more referrals than no incentive. There is no difference in referral choice between incentive conditions.
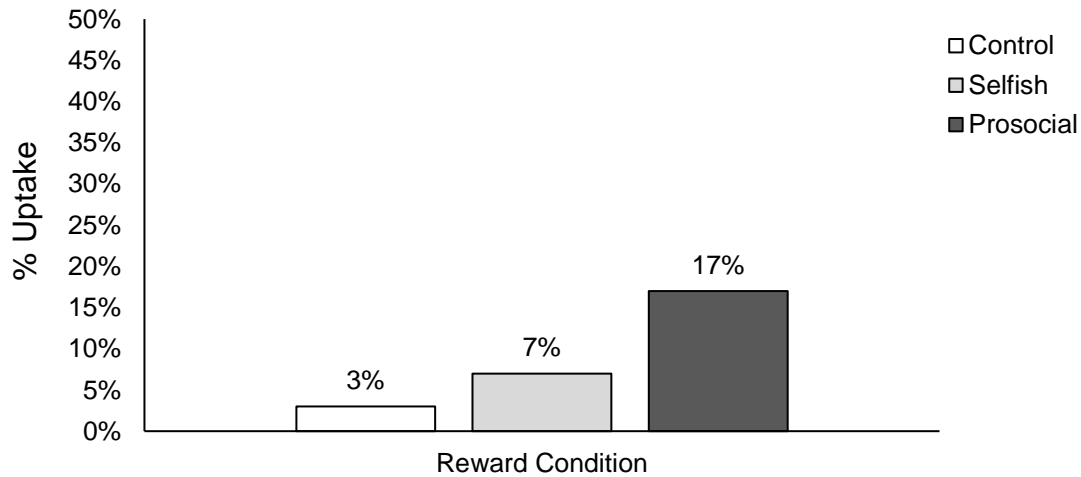
B.

Figure 3(B). Prosocial referral incentives lead to higher uptake than selfish incentives or no referral incentive.
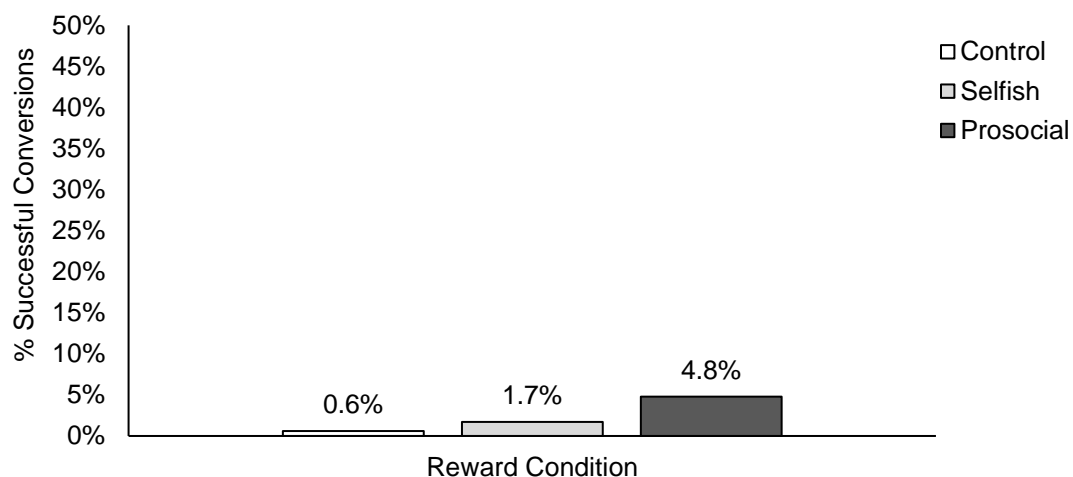
C.

Figure 3(C). Prosocial referrals lead to the most new customer conversions.

FIGURE 4

STUDY 3: REFERRAL CHOICE (A), RECIPIENT UPTAKE (B), AND OVERALL
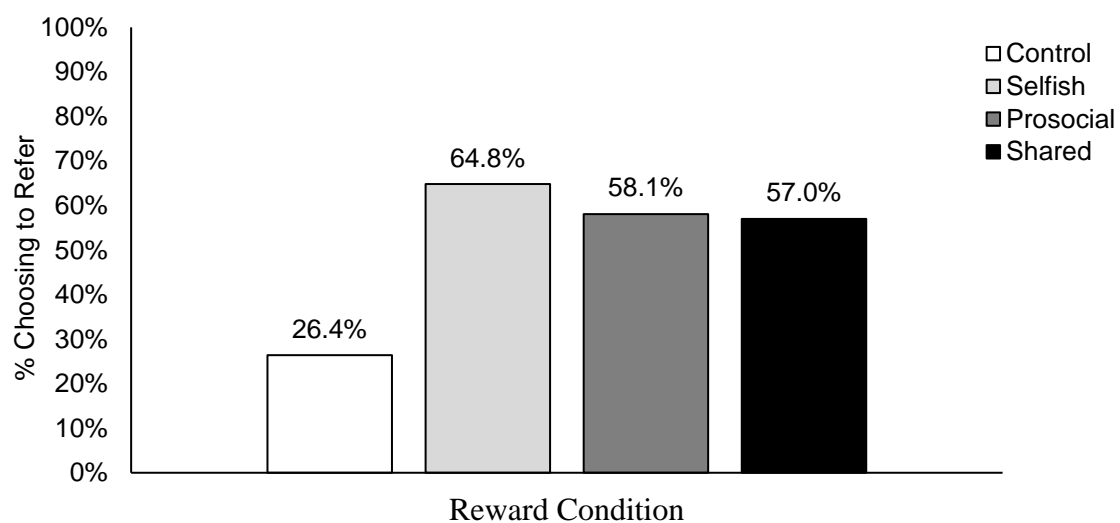CONVERSION RATE (C) BY CONDITION

A.

Figure 4(A). Selfish, prosocial, and shared incentives lead to more referrals than no incentive. There is no difference in referral choice between incentive conditions.
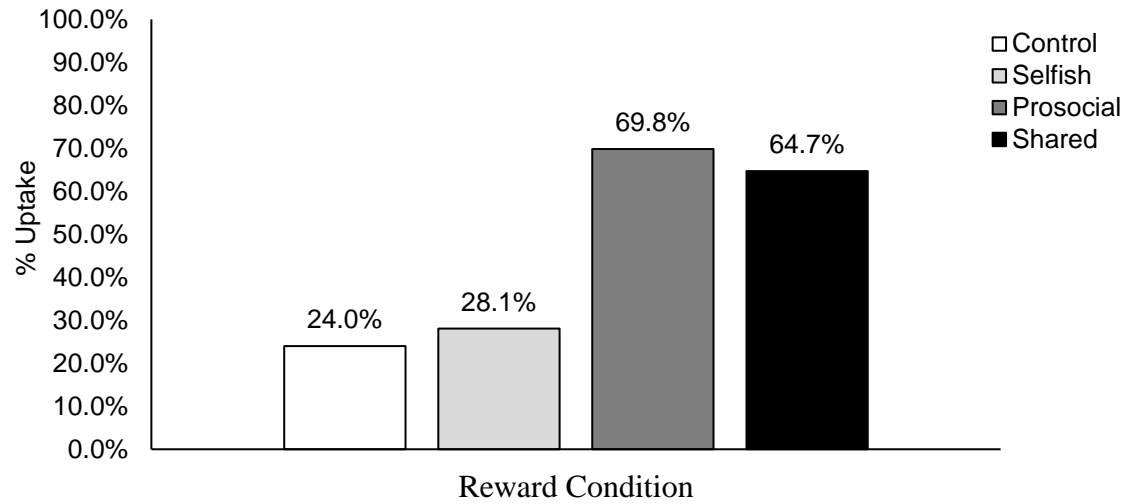
B.

Figure 4(B). Prosocial and shared referral incentives lead to higher uptake than selfish incentives or no referral incentive.
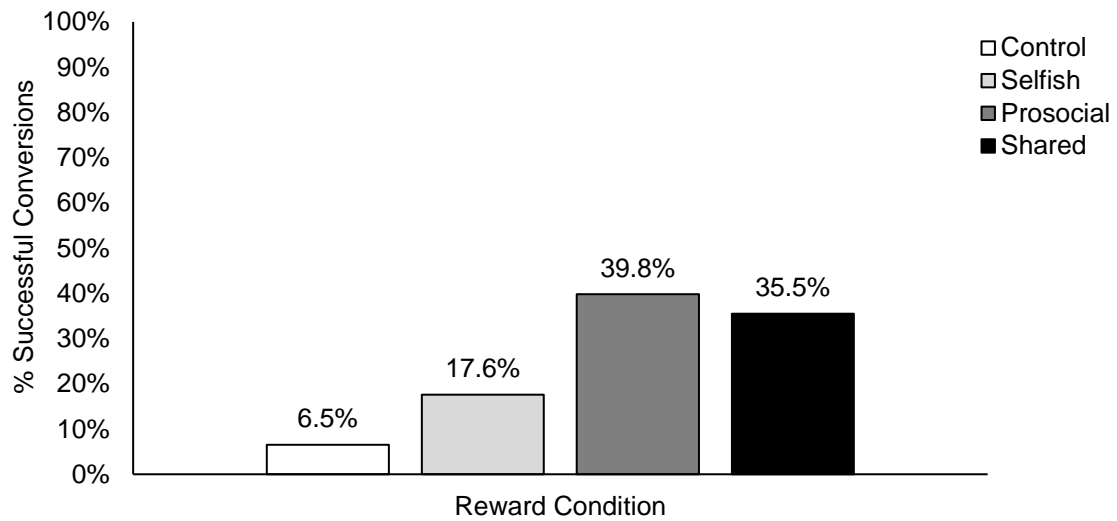
C.

Figure 4(C). Prosocial and shared referrals lead to the most new customer conversions.

FIGURE 5

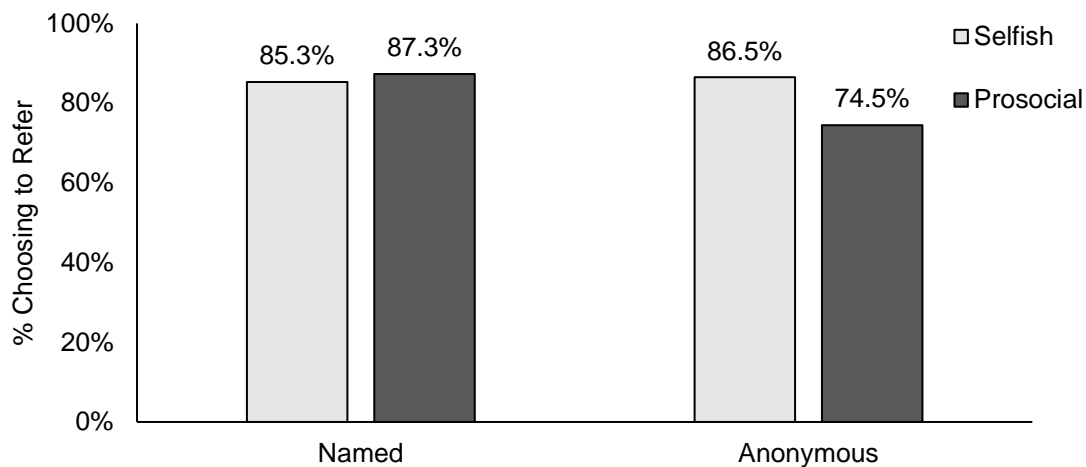STUDY 4A: REFERRAL CHOICE BY REFERRAL TYPE AND ANONYMITY

Figure 5. Selfish and prosocial incentives lead to equal referral choice when the referral is not anonymous. When the referral is anonymous, selfish incentives lead to more referrals.

FIGURE 6

STUDY 4B: REFERRAL CHOICE BY REFERRAL TYPE AND RECIPIENT CLOSENESS
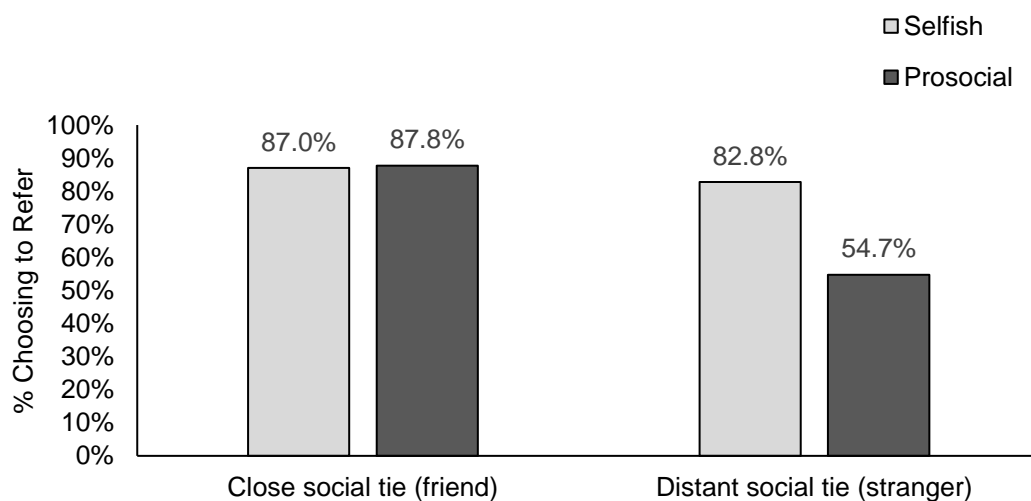
Figure 6. Selfish and prosocial incentives lead to equal referral choice when the recipient is a friend. When the recipient is a stranger, selfish incentives lead to more referrals.

FIGURE 7

STUDY 5B: UPTAKE CHOICE BY REFERRAL TYPE AND ACTION COST

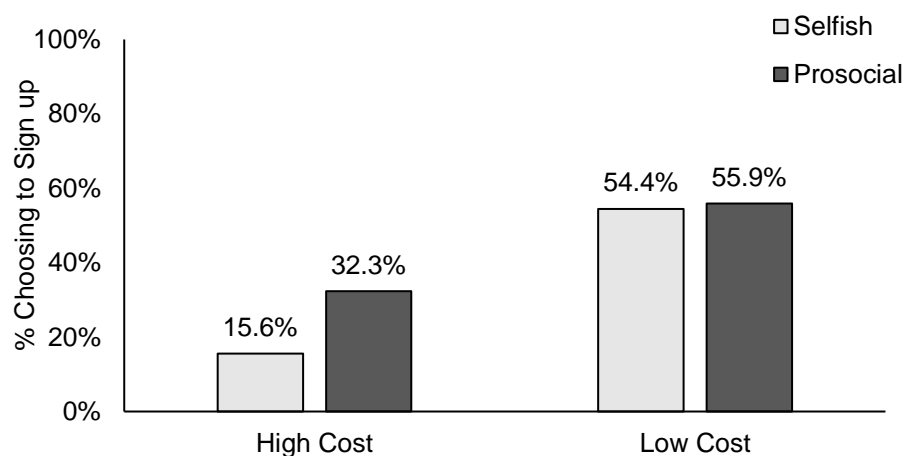*Figure 7.* Prosocial referral incentives lead to higher uptake when action cost is high. When action cost is low, selfish and prosocial referral incentives lead to equal uptake.

FIGURE 8

STUDY 5A: CHOICE TO ACT BY ROLE (REFERRER/RECIPIENT) AND REFERRAL
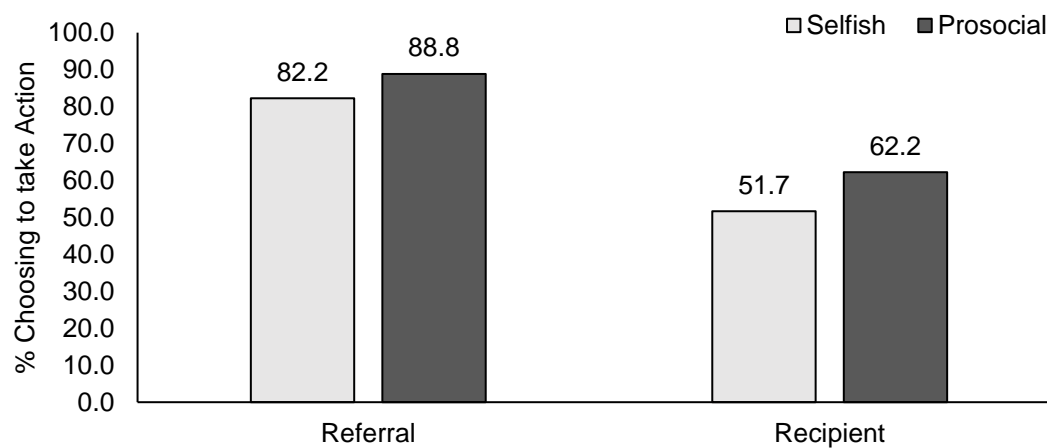
TYPE (PROSOCIAL/SELFISH)

Figure 8. Proscial referral incentives lead to marginally significantly higher referral choice and significantly higher uptake choice.

TABLE 1: SUMMARY RESULTS OF ALL STUDIES

Study #	Study Type	Experimental Conditions	% Referral Choice	% Uptake Choice	% New Customer Conversions
Study 1	Field Experiment N = 6,364	Control			.08%[a]
		Selfish			.39%[ab†]
		Prosocial			.94%[b†c]
		Shared			.94%[b†c]
		Donation			.08%[a]
Study 2	Field Experiment N = 1,438	Control	17.79%[a]	3.45%[a]	.61%[a]
		Selfish	25.91%[b]	6.61%[a]	1.71%[a]
		Prosocial	28.22%[b]	16.91%[b]	4.77%[b]
Study 3	Incentivized Lab Experiment N = 369	Control	26.37%[a]	24.00%[a]	6.52%[a]
		Selfish	64.84%[b]	28.07%[a]	17.58%[b]
		Prosocial	58.06%[b]	69.81%[b]	39.79%[c]
		Shared	56.99%[b]	64.71%[b]	35.48%[c]
Study 4A	MTurk Scenario Experiment N = 805	Selfish Referral/ Named	85.29%[a]		
		Prosocial Referral/ Named	87.32%[a]		
		Selfish Referral/ Anonymous	86.50%[a]		
		Prosocial Referral/ Anonymous	74.49%[b]		
Study 4B	MTurk Scenario Experiment N = 810	Selfish Referral/ Friend Recipient	87.00%[a]		
		Prosocial Referral/ Friend Recipient	87.75%[a]		
		Selfish Referral/ Stranger Recipient	82.76%[a]		
		Prosocial Referral/ Stranger Recipient	54.73%[b]		
Study 5A	MTurk Scenario Experiment N = 740	Selfish Referral/ High Cost		15.59%[a]	
		Prosocial Referral/ High Cost		32.20%[b]	
		Selfish Referral/ Low Cost		54.40%[c]	
		Prosocial Referral/ Low Cost		55.90%[c]	
Study 5B	MTurk Scenario Experiment N = 816	Selfish Referral/ Referral Role	82.21%[a†]		
		Prosocial Referral/ Referral Role	88.83%[a†]		
		Selfish Referral/ Recipient Role		51.74%[a]	
		Prosocial Referral/ Recipient Role		62.19%[b]	

Notes: Significant differences are denoted by superscript letters – condition proportions for each study in the same column that share a same letter are insignificant from each other at $p < .05$. A dagger symbol ([†]) indicates a statistically significant difference at a $p < .10$ level

TABLE 2
STUDY 5B: STUDY DESIGN

Role	Referral Type	Incentive Recipient	Description
Referrer	Selfish	Self	"You will receive a free year of Food2Me deliveries"
	Prosocial	Other	"[Friend's name] will receive a free year of Food2Me deliveries"
Recipient	Selfish	Other	"[Friend's name] will receive a free year of Food2Me deliveries"
	Prosocial	Self	"You will receive a free year of Food2Me deliveries"

APPENDIX A: STUDY MATERIAS

STUDY 1

Control condition: Selfish referral condition:

Invite a friend to join GiftAMeal to help fight hunger.

Our growth and movement is built on referrals to friends from people like YOU. We would really appreciate it if you would invite your friends to download the app and join the GiftAMeal community. For each friend who signs up with your individual code: <<Promo Code>>, we will help provide a meal to someone in need through a local food bank. Think about it: if four people download the app with your code, 4 meals will be provided on your behalf.

It's that simple!

Wondering what to send to your friend? How about this:
Hey! If you download the GiftAMeal app with my code: <<Promo Code>>, you'll be able to provide meals to those in need by taking pictures at restaurants on the app. They'll provide a meal right away just for downloading!
http://www.giftameal.com/download

Spread the love!

The GiftAMeal Team
Andrew, Aidan, Jacob, and Michael

Note: This promotion applies for all downloads completed in the next two weeks. Accounts must be created on separate phones. As always, you can reach out to us at info@giftameal.com with any questions you may have!

Invite a friend - get a $5 gift card to Amazon.

For each friend that downloads the GiftAMeal app with your invitation code, you will receive a $5 electronic gift card to Amazon. All you need to do is have them sign up with your individual code: <<Promo Code>>. Think about it: if four people download the app with your code, you will receive a $20 gift card.

It's that simple!

Wondering what to send to your friend? How about this:
Hey! If you download the GiftAMeal app with my code: <<Promo Code>>, you'll be able to provide meals to those in need by taking pictures at restaurants on the app, and I'll get a $5 gift card to Amazon! http://www.giftameal.com/download

Spread the love!

The GiftAMeal Team
Andrew, Aidan, Jacob, and Michael

Note: This promotion applies for all downloads completed in the next two weeks. Rewards will be distributed at the end of the two week period. Accounts must be created on separate phones. As always, you can reach out to us at info@giftameal.com with any questions you may have!

Prosocial referral condition:

Invite a friend - they get a $5 gift card to Amazon.

Help out a friend while helping those in need! Each friend that downloads the GiftAMeal app with your invitation code will receive a $5 electronic gift card to Amazon. All you need to do is get them to sign up with your individual code: <<Promo Code>>.

It's that simple!

Wondering what to send to your friend? How about this:
Hey! If you download the GiftAMeal app with my code: <<Promo Code>>, you'll be able to provide meals to those in need by taking pictures at restaurants on the app, and you'll get a $5 gift card to Amazon! http://www.giftameal.com/download

Spread the love!

The GiftAMeal Team
Andrew, Aidan, Jacob, and Michael

Note: This promotion applies for all downloads completed in the next two weeks. Rewards will be distributed at the end of the two week period. Accounts must be created on separate phones. As always, you can reach out to us at info@giftameal.com with any questions you may have!

Shared referral condition:

Invite a friend - you and your friend each get a $2.50 gift card to Amazon.

For each friend that downloads the GiftAMeal app with your invitation code, you will each receive a $2.50 electronic gift card to Amazon. All you need to do is have them sign up with your individual code: <<Promo Code>>. Think about it: if four people download the app with your code, you will receive a $10 gift card, and each friend will receive a $2.50 gift card.

It's that simple!

Wondering what to send to your friend? How about this:
Hey! If you download the GiftAMeal app with my code: <<Promo Code>>, you'll be able to provide meals to those in need by taking pictures at restaurants on the app, and we'll each get a $2.50 gift card to Amazon! http://www.giftameal.com/download

Spread the love!

The GiftAMeal Team
Andrew, Aidan, Jacob, and Michael

Note: This promotion applies for all downloads completed in the next two weeks. Rewards will be distributed at the end of the two week period. Accounts must be created on separate phones. As always, you can reach out to us at info@giftameal.com with any questions you may have!

Donation referral condition:

GiftAMeal

Invite a friend - we donate $5 to Feeding America.

For each friend that downloads the GiftAMeal app with your invitation code, we will donate $5 to Feeding America. All you need to do is have them sign up with your individual code: <<Promo Code>>. Think about it: if four people download the app with your code, we will donate $20 to Feeding America.

It's that simple!

Wondering what to send to your friend? How about this:
Hey! If you download the GiftAMeal app with my code: <<Promo Code>>, you'll be able to provide meals to those in need by taking pictures at restaurants on the app, and they'll donate $5 to Feeding America! http://www.giftameal.com/download

Spread the love!

The GiftAMeal Team
Andrew, Aidan, Jacob, and Michael

Note: This promotion applies for all downloads completed in the next two weeks. Donation will be distributed at the end of the two week period. Accounts must be created on separate phones. As always, you can reach out to us at info@giftameal.com with any questions you may have!

STUDY 2

Control condition:

Referrer email

Sample size 500 (members randomized using an online random math generator)

Subject Line: Refer your friends to Game Access!

Hi [member-name],

If you enjoy your Game Access membership and think we're providing a valuable service to Canadians across this great vast land, then why not tell your friends?

Game Access is the only video game site of its kind in Canada and the longest running Canadian video game rental service ever! We thank you for being a valuable member of the site and would appreciate any recommendation you'd give! We all kind of hate banner ads, so we feel that the best way for Game Access to grow is by word of mouth from dedicated and happy members such as yourself!

Thanks for spreading the word and happy gaming!

Game Access

Recipient email

Subject Line: Hi [friend_name], I just joined a cool new service!

Hey, [friend_name],

I'm a member of this awesome video rental service called Gameaccess.ca. The site offers over 4,000 video games on all major consoles and you can rent them for as long as you like, since there's no late fees ever!

[referrer name]

Selfish condition:

Referrer email

Sample size 500 (members randomized using an online random math generator)

Subject Line: Refer your friends to Game Access and get a free month!

Hi [member-name],

If you enjoy your Game Access membership and think we're providing a valuable service to Canadians across this great vast land, then why not tell your friends? If they join, you get a free month!

Game Access is the only video game site of its kind in Canada and the longest running Canadian video game rental service ever! We thank you for being a valuable member of the site and would appreciate any recommendation you'd give! We all kind of hate banner ads, so we feel that the best way for Game Access to grow is by word of mouth from dedicated and happy members such as yourself!

Thanks for spreading the word and happy gaming!

Game Access

Recipient email

Subject Line: Hi [friend_name], I just joined a cool new service!

Hey, [friend_name],

I'm a member of this awesome video rental service called Gameaccess.ca. The site offers over 4,000 video games on all major consoles and you can rent them for as long as you like, since there's no late fees ever! Check them out, and if you join I'll get a free month!

[referrer name]

Prosocial condition:

Referrer email

Sample size 500 (members randomized using an online random math generator)

Subject Line: Refer your friends to Game Access and they each get their first month free!

Hi [member-name],

If you enjoy your Game Access membership and think we're providing a valuable service to Canadians across this great vast land, then why not tell your friends? If they join, they'll get their first month of service for FREE!

Game Access is the only video game site of its kind in Canada and the longest running Canadian video game rental service ever! We thank you for being a valuable member of the site and would appreciate any recommendation you'd give! We all kind of hate banner ads, so we feel that the best way for Game Access to grow is by word of mouth from dedicated and happy members such as yourself!

Thanks for spreading the word and happy gaming!

Game Access

Recipient email

Subject Line: Hi [friend_name], I just joined a cool new service!

Hey, [friend_name],

I'm a member of this awesome video rental service called Gameaccess.ca. The site offers over 4,000 video games on all major consoles and you can rent them for as long as you like, since there's no late fees ever! Check them out and get a free month of rentals when you join using the link I pasted below!

[referrer name]

STUDY 3:

<u>Personality quiz test results:</u>

You are somewhat more **Extroverted:**

This means you like getting energy from active involvement in events and having a lot of different activities. You are excited when you're around people and you like to energize other people. You like moving into action and making things happen. You generally feel at home in the world. You often understand a problem better when you can talk out loud about it.

You are both Extroverted **AND** Introverted:

You are a balance of both Extroversion and Introversion, sometimes referred to as an "Ambivert". Ambiverts have introverted and extroverted traits, but neither trait is dominant. As a result, they have more balanced or nuanced personalities. Ambiverts move between being social or being solitary, speaking up or listening carefully with greater ease than either extroverts or introverts.

You are somewhat more **Introverted:**

Don't confuse introversion with shyness or reclusiveness. They are not related. Being an introvert means that you like getting your energy from dealing with the ideas, pictures, memories, and reactions that are inside your head, in your inner world. You often prefer doing things alone or with a few people you feel comfortable with. You take time to reflect so that you have a clear idea of what you'll be doing when you decide to act. Ideas are almost solid things for you. Sometimes you like the idea of something better than the real thing.

<u>Note: These results were adapted from the Myers & Briggs Foundation (http://www.myersbriggs.org/my-mbti-personality-type/mbti-basics/extraversion-or-introversion.htm)</u>

Control and Selfish condition recipient e-mails:

From: CBlabWUSTL@gmail.com

Subject: _____ thought you would enjoy this survey!

Your friend, _____, just took a quick personality quiz as part of a study at WashU and they wanted to share the link with you! You can take the survey by using this link ***www.linkwillgohere.com*** and entering this code _____.

Prosocial condition recipient e-mail:

From: CBlabWUSTL@gmail.com

Subject: _____ thought you would enjoy this survey (plus get a Starbucks gift card)!

Your friend, _____, just took a quick personality quiz as part of a study at WashU and they wanted to share the link with you! You can take the survey by using this link ***www.linkwillgohere.com*** and entering this code -------------.

If you take the quick survey, you will receive a $3.00 electronic gift card to Starbucks.

Shared condition recipient e-mail:

From: CBlabWUSTL@gmail.com

Subject: _____ thought you would enjoy this survey (plus get a Starbucks gift card)!

Your friend, _____, just took a quick personality quiz as part of a study at WashU and they wanted to share the link with you! You can take the survey by using this link **_www.linkwillgohere.com_** and entering this code _____**.**

If you take the quick survey, you will receive a $1.50 electronic gift card to Starbucks.

STUDY 4B

Friend Recipient/Selfish referral condition

From: Amazon <BOLD@amazon.com>

Subject: Join Amazon's new, free loyalty program!

Dear _____,

_____ has been using our new, free loyalty program, Amazon BOLD, and wanted to share the savings with you! If you're interested, follow this link to learn more: Amazon.com/BOLDLoyalty.

Friend Recipient/Prosocial referral condition

From: Amazon <BOLD@amazon.com>

Subject: Join Amazon's new, free loyalty program and get a $10 Visa gift card!

Dear _____,

_____ has been using our new, free loyalty program, Amazon BOLD, and wanted to share the savings with you! Sign up today and you will receive a $10 Visa gift card. If you're interested, follow this link to learn more: Amazon.com/BOLDLoyalty.

Stranger recipient/Selfish referral condition

F

From: Amazon <BOLD@amazon.com>

Subject: Join Amazon's new, free loyalty program!

Dear _____,

One of our customers, _____, has been using our new, free loyalty program, Amazon BOLD, and wanted to share the savings with you! If you're interested, follow this link to learn more: Amazon.com/BOLDLoyalty.

Stranger recipient/Prosocial referral condition

F

From: Amazon <BOLD@amazon.com>

Subject: Join Amazon's new, free loyalty program and get a $10 Visa gift card!

Dear _____,

One of our customers, _____, has been using our new, free loyalty program, Amazon BOLD, and wanted to share the savings with you! Sign up today and you will receive a $10 Visa gift card. If you're interested, follow this link to learn more: Amazon.com/BOLDLoyalty.

STUDY 5A

High cost/Selfish referral

From: Food2Me <Food2Me@delivery.com>

To: [Participant]

Subject: Download Food2Me and get a free year of delivery!

Dear [Participant],

[Friend] has been using our new food delivery app, and thought you might like it too! Food2Me delivers food from your favorite local restaurants for an annual fee of $5. Sign up today and **[Friend] will receive a receive a $20 gift card to Amazon for referring you!**

This is an exclusive offer - to verify that only one person uses this offer, **print out the attached documents, fill them out, and mail them to the Food2Me headquarters** with your unique code: xyq6msp204.

Food2Me address: 201039 5th Ave, Seattle, WA 98121

High cost/Prosocial referral

From: Food2Me <Food2Me@delivery.com>

To: [Participant]

Subject: Download Food2Me!

Dear [Participant],

[Friend] has been using our new food delivery app, and thought you might like it too! Food2Me delivers food from your favorite local restaurants for an annual fee of $5. Sign up today and **you will receive a $20 gift card to Amazon for joining!**

This is an exclusive offer - to verify that only one person uses this offer, **print out the attached documents, fill them out, and mail them to the Food2Me headquarters** with your unique code: xyq6msp204.

Food2Me address: 201039 5th Ave, Seattle, WA 98121

Low cost/Selfish referral

From: Food2Me <Food2Me@delivery.com>

To: [Participant]

Subject: Download Food2Me!

Dear [Participant],

[Friend] has been using our new food delivery app, and thought you might like it too! Food2Me delivers food from your favorite local restaurants for an annual fee of $5. 5. Sign up today and **[Friend] will receive a $20 gift card to Amazon for referring you!**

This is an exclusive offer - to verify that only one person uses this offer, **simply click this unique link** to sign up: Food2Me.com/xyq6msp204.

Low cost/Prosocial referral

From: Food2Me <Food2Me@delivery.com>

To: [Participant]

Subject: Download Food2Me!

Dear [Participant],

[Friend] has been using our new food delivery app, and thought you might like it too! Food2Me delivers food from your favorite local restaurants for an annual fee of $5. Sign up today and **you will receive a $20 gift card to Amazon for joining!**

This is an exclusive offer - to verify that only one person uses this offer, **simply click this unique link** to sign up: Food2Me.com/xyq6msp204.

STUDY 5B

Referrer role/Selfish referral

You joined a food delivery service called Food2Me which delivers food from your favorite local restaurants **for $50/year**.

Food2Me sends you an email, asking if you would like to refer a friend to join the service. If your friend signs up, Food2Me will **give you a free year of delivery.**

If you chose to refer your friend, [Friend], Food2Me would send [Friend] the following email:

From: Food2Me <Food2Me@delivery.com>

To: [Friend]

Subject: Download Food2Me!

Dear [Friend],

[Participant] might like it too! Food2Me delivers food from your favorite local restaurants for an annual fee of $50. **Download the app using [this link](#) and [Participant] will receive a free year of Food2Me deliveries!**

Referrer role/Prosocial referral

You joined a food delivery service called Food2Me which delivers food from your favorite local restaurants **for $50/year**.

Food2Me sends you an email, asking if you would like to refer a friend to join the service. If your friend signs up, Food2Me will **give you a free year of delivery.**

If you chose to refer your friend, [Friend], Food2Me would send [Friend] the following email:

From: Food2Me <Food2Me@delivery.com>

To: [Friend]

Subject: Download Food2Me and get a free year of delivery!

Dear [Friend],

[Participant] might like it too! Food2Me delivers food from your favorite local restaurants for an annual fee of $50. **Download the app using [this link](#) and you will receive a free year of Food2Me deliveries!**

Recipient role/Selfish referral

From: Food2Me <Food2Me@delivery.com>

To: [Participant]

Subject: Download Food2Me!

Dear [Participant],

[Friend] has been using our new food delivery app, and thought you might like it too! Food2Me delivers food from your favorite local restaurants for an annual fee of $50. **Download the app using [this link](#) and [Friend] will receive a free year of Food2Me deliveries!**

Recipient role/Prosocial referral

From: Food2Me <Food2Me@delivery.com>

To: [Participant]

Subject: Download Food2Me and get a free year of delivery!

Dear [Participant],

[Friend] has been using our new food delivery app, and thought you might like it too! Food2Me delivers food from your favorite local restaurants for an annual fee of $50. **Download the app using this link and you will receive a free year of Food2Me deliveries!**

APPENDIX B: ADDITIONAL ANALYSES

STUDY 3:

Referral Results:

Condition	N	Referral Choice	Reputational Benefits	Psychological Costs	Social Obligations
Control	93	26.37%	3.56 (1.26)	2.43 (1.27)	3.49 (1.43)
Selfish	91	64.84%	3.69 (1.34)	2.48 (1.32)	2.98 (1.34)
Prosocial	93	58.06%	4.41 (1.33)	1.75 (1.17)	2.65 (1.36)
Shared	93	56.99%	4.14 (1.33)	2.07 (1.20)	2.71 (1.34)

Shared referral vs. Selfish referral Mediation

- Direct Effect: .72; 95% CI [.02, 1.43]
- Reputational Benefits - Indirect Effect: -.19; 95% CI [-.47, -.02]
- Psychological Costs - Indirect Effect: .09; 95% CI [-.03, .37]
- Social Obligations - Indirect Effect: -.21; 95% CI [-.57, .07]

Recipient Uptake:

Condition	N	Recipient Uptake	Imposing	Annoyed	Enjoy
Control	6	24%	2.83 (2.32)	2 (1.27)	3.8 (1.30)
Selfish	16	28.07%	1.56 (1.50)	1.5 (1.51)	4.38 (1.31)
Prosocial	37	69.81%	1.48 (.91)	1.45 (1.06)	4.41 (1.38)
Shared	33	64.71%	1.35 (.63)	1.23 (.59)	4.81 (1.27)

Follow up Questions:

- How much did you feel like your friend was imposing on you by sending this quiz? (1 = Not at all, 7 = Very much so)
- How annoyed were you about receiving this quiz from your friend? (1 = Not at all, 7 = Very much so)

- How much did you enjoy this personality quiz (1 = Did not enjoy at all, 7 = Very much enjoyed it)

APPENDIX C: ADDITIONAL STUDIES

APPENDIX STUDY 1

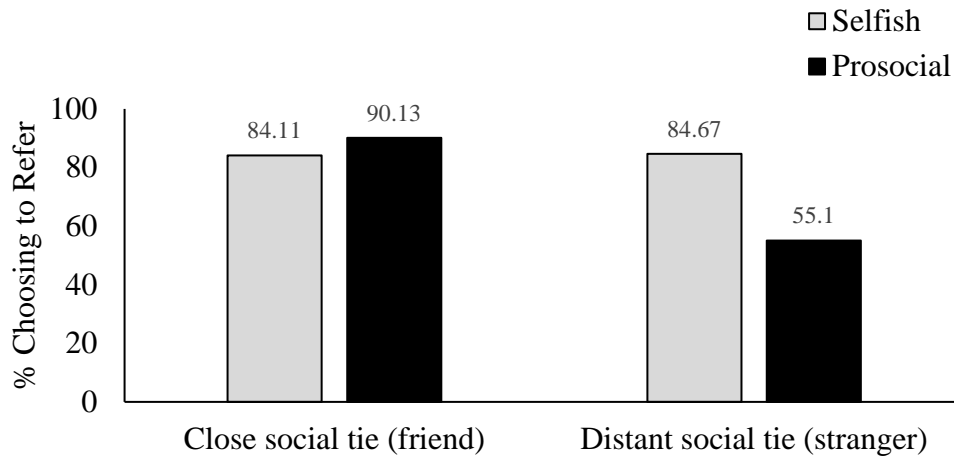This appendix study was designed to replicate Study 4A.

Methods

The study used a 2(rewards: selfish vs. prosocial) x 2(referral recipient: friend vs. stranger) between-subjects experimental design with 600 Mechanical Turk participants. This study used the same materials as Study 4A. We additionally measured general social approval as well as psychological costs (see Appendix Table 1 for follow-up results). In order to keep the questions consistent between the friend and stranger recipient conditions, for the reputational benefit items, participants were asked, "How would others view you if you made this referral?" Therefore, the reputational benefit items in this case actually measure general social approval rather than reputational benefits.

Results

A binary logistic regression was performed on the choice to refer as a function of referral recipient type (friend/stranger) and incentive type (selfish/prosocial). This analysis yielded a significant interaction of recipient and incentive type (Waldχ^2 (1) = 11.19, p < .001). For participants in the friend condition, we observed an equal number of referrals for the prosocial (90.13%) and the selfish referral reward (84.11%, (Waldχ^2 (1) = 2.45, p = .12). However, when referring a stranger, the selfish reward (84.67%) was significantly more successful than the prosocial reward (55.10%, Waldχ^2 (1) = 30.92, p < .001), consistent with standard incentivized behavior.

APPENDIX STUDY 1: REFERRAL CHOICE BY REWARD AND RECIPIENT

Legend: □ Selfish, ■ Prosocial

Close social tie (friend): Selfish 84.11, Prosocial 90.13
Distant social tie (stranger): Selfish 84.67, Prosocial 55.1

Y-axis: % Choosing to Refer (0–100)

APPENDIX TABLE 1

Recipient Condition	Referral Reward Condition	General Social Approval (1-7)	Psychological Costs° (1-7)
Close Social Tie (Friend)	Selfish	4.26 (1.53)	2.64 (1.67)
	Prosocial	5.27*** (1.20)	1.65*** (1.02)
Distant Social Tie (Stranger)	Selfish	3.95 (1.55)	2.20 (1.47)
	Prosocial	4.73*** (1.58)	2.62* (1.33)

† p<.10, *p < .05, **p < .01, ***p<.001; these significance notations refer to differences in mean evaluations for selfish referral rewards compared to prosocial referral rewards with standard deviations in parentheses. A° symbol next to the variable name indicates that there is a significant interaction between recipient and referral reward condition on this variable at a p < .05 level.

APPENDIX STUDY 2

This appendix study was designed to replicate Study 4B

Methods

The study used a 2(rewards: selfish vs. prosocial) x 2(control vs. anonymous) between-subjects design. 580 Mechanical Turk participants (M_{Age} = 35.01, 58.72% Female) completed the study. This study

used the same materials as Study 4B. We additionally measured relationship benefits, psychological

costs, and social obligations (see Appendix Table 2 for follow-up results). We did not measure

reputational benefits, because half of the participants made anonymous referrals.

Results

We found an interaction between referral condition (control/anonymous) and reward type

(selfish/prosocial; $X^2(1) = 6.58$, *p* = .01). For participants in the control condition, we observed an equal

number of referrals for the prosocial (88.74%) and the selfish referral reward (89.26%; $\chi^2(1) = .01$, *p* =

.89). However, when the referral was anonymous, the selfish reward (92.62%) was significantly more

successful than the prosocial reward (75.57%; $\chi^2(1) = 15.54$, *p* < .001).

APPENDIX STUDY 2: REFERRAL CHOICE BY REWARD AND ANONYMITY
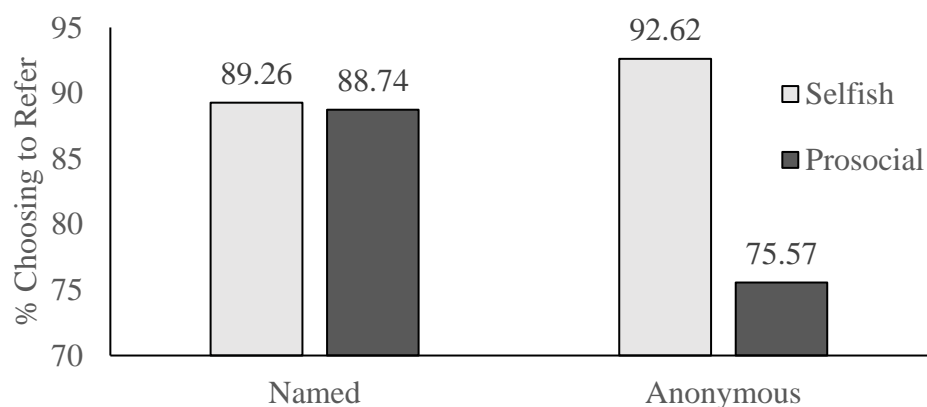
APPENDIX TABLE 2

Anonymity Condition	Referral Reward Condition	Relationship Benefits	Psychological Costs (1-7)	Social Obligations

		(1-7)		(1-7)
Named	Selfish	4.15 (.69)	2.42 (1.56)	3.08 (1.67)
	Prosocial	4.41** (.89)	1.67*** (.95)	2.59** (1.59)
Anonymous	Selfish	4.11 (.72)	2.23 (1.47)	2.83 (1.73)
	Prosocial	4.33* (.77)	1.89* (1.28)	2.81 (1.67)

† p<.10, *p < .05, **p < .01, ***p<.001; these significance notations refer to differences in mean evaluations for selfish referral rewards compared to prosocial referral rewards with standard deviations in parentheses. A° symbol next to the variable name indicates that there is a significant interaction between anonymity condition and referral reward condition on this variable at a p < .05 level.

APPENDIX STUDY 3

This appendix study was designed to replicate Study 5A with an additional manipulation of action cost.

Methods

As outlined in our pre-registered research plan (available at https://osf.io/6upq7/), we recruited 800 MTurk participants; 818 completed the study (M_{Age} = 35.52, 50.86% female).

To further understand the uptake stage of the referral process, we had participants imagine that a friend sent them an email asking if they would like to try Food2Me (the same food delivery service described in Study 5A). Participants provided their own first name and the first name of a close friend. We manipulated whether the referral was prosocial (the recipient/participant would receive an incentive) or selfish (the referrer/participant's friend would receive an incentive). We also manipulated action costs by directly varying the cost of uptake ($2 or $100 per year to join). For emails used in all conditions, see Appendix A.

Participants then read, "The Food2Me restaurant delivery service costs [$100/$2] per year and you may cancel at any time. Would you sign up for the Food2Me delivery service? Remember if you join, [you/Friend] get(s) a free year of deliveries!" Participants could respond either "Yes, I would sign up for the Food2Me delivery service" or "No, I would not sign up for the Food2Me delivery service."

Note that, as in Study 2, Study 5A, and Study 5B, we told participants (recipients) in the selfish referral conditions that the friend who referred them would be rewarded if they followed through on the referral. We informed participants of this benefit to their friend to examine whether, even when recipients know that their friend will receive an incentive (which is not always the case in these incentive designs), selfish referrals have a minimal positive effect at the uptake stage due to the higher burden of follow-through. Participants were required to correctly identify who would receive an incentive (themselves or their friend) before they could move to the uptake decision to confirm that they understood the incentive structure before making their uptake choice. Finally, as a manipulation check, we measured action costs ($\alpha = .78$).

Results

Manipulation Check. As expected, the high cost condition was perceived as having higher action costs than the low cost condition ($M_{High\text{-}Cost} = 3.83$, $SD = 1.39$ vs. $M_{Low\text{-}Cost} = 2.41$, $SD = 1.46$; $t(816) = 1.431$, $p < .001$).

Uptake decision. Table 1 summarizes the results. We performed a binary logistic regression on uptake decision as a function of uptake cost (high/low) and referral type (selfish/prosocial). This analysis yielded a significant interaction of uptake cost and incentive type (Waldχ^2 (1) = 5.49, $p = .019$, Figure 8). For participants in the high-cost condition, we observed more sign-ups for the prosocial referral (51.94%) than the selfish referral (34.76%,

(Waldχ^2 (1) = 12.37, p < .001), consistent with Studies 2-3 as well as typical incentivized behavior. However, when uptake cost was low, there was no difference in uptake choice by those in the prosocial condition (69.84%) versus the selfish condition (69.50%, Waldχ^2 (1) = .004, p = .95).

APPENDIX STUDY 3: UPTAKE CHOICE BY ACTION COST (HIGH/LOW) AND INCENITVE (SELF-BENEFITING/OTHER-BENEFITING)
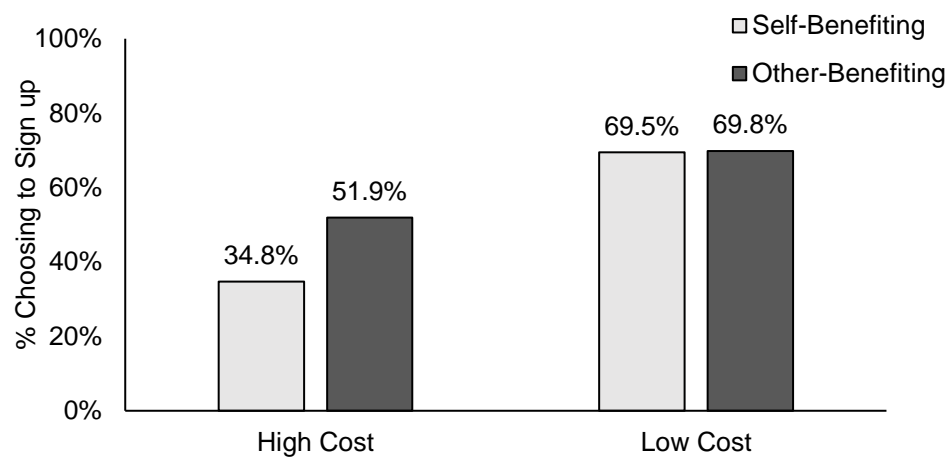
APPENDIX STUDY 4

This appendix study was designed to replicate Study 5B.

Methods

We recruited 800 MTurk participants (803 participants took the survey; M$_{Age}$ = 36.90, 66.29% female). This study involved a 2(incentive: selfish vs. prosocial) x 2(role: referrer vs. recipient) between-subjects design. This study used the same materials as Study 5A. In addition to measuring action choice, we measured action costs (α = .81), expected reputational benefits (α = .96), relationship benefits (α = .87) and psychological costs (α = .94).

Results

Action. We observed a significant interaction between participant role (referrer/recipient) and incentive type (selfish/prosocial; $\chi^2(1)$ = 11.51, *p* = .001, Figure 7). For participants in the referrer condition, we observed more participants choosing to refer for a prosocial incentive (90.59%) than a selfish incentives (83.74%; ($\chi^2(1)$ = 4.24, *p* =.038). For participants in the recipient condition, we observed more participants choosing to follow-through for a selfish incentive (59.60%) than a prosocial incentive (46.23%; ($\chi^2(1)$ = 7.12, *p* =.008).

APPENDIX STUDY 4: CHOICE TO ACT BY INCENITVE (SELFISH/PROSOCIAL) AND ROLE

(REFERRER/RECIPIENT)
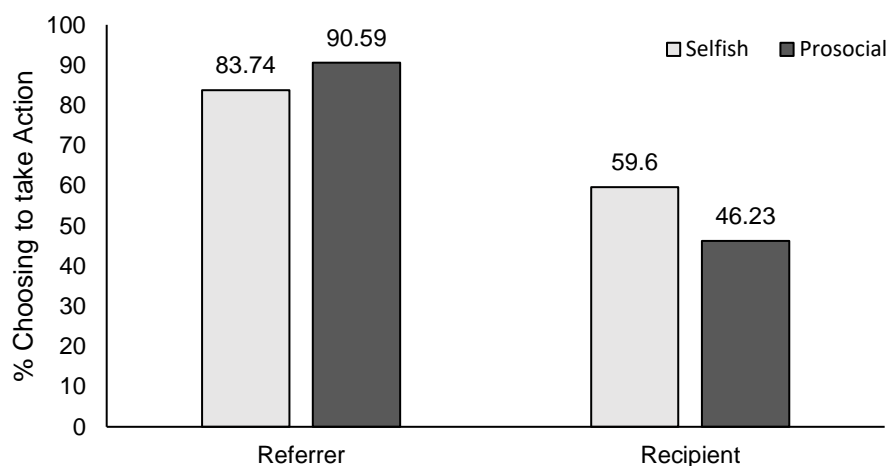
Manipulation Check. We observed a significant main effect of incentive type on ratings of action cost; prosocial incentives were viewed as a lower cost than selfish incentives (F(1, 791) = 13.41, *p* < .001). Participant role also has a significant main effect; taking action in the recipient role was perceived as a greater burden than taking action in the referrer role (F(1, 791) = 253.78, *p* < .001). There was also a

significant interaction between incentive (selfish vs. prosocial) and role (referrer vs. recipient; $F(1, 796)$ = 14.21, $p < .001$). Specifically, in referrer condition, there was no difference in perceived cost of taking action (referring) between the two incentives ($M_{Selfish}$ = 2.08, SD = 1.28 vs. $M_{Prosocial}$ = 2.07, SD = 1.28; $t(397)$ = .08, p = .93). In the recipient condition, action cost was significantly higher when offered a prosocial incentive ($M_{Prosocial}$ = 4.03, SD = 1.53) compared to a selfish incentive ($M_{Selfish}$ = 3.29, SD = 1.50; $t(391)$ = -4.84, $p < .001$).

Reputational Benefits. There was a significant main effect of incentive type on ratings of reputational benefits; participants expected higher reputational benefits when offered a prosocial (vs. selfish) incentive ($F(1, 792)$ = 34.56, $p < .001$). Participant role, however, did not have a significant main effect on reputational benefits ($F(1, 792)$ = .42, p = .52). There was a non-significant interaction role and incentive type ($F(1, 792)$ = 1.14, p = .29). In the referrer condition, reputational benefits were significantly higher for the prosocial incentive ($M_{Prosocial}$ = 5.44, SD = 1.49) than the selfish incentive ($M_{Selfish}$ = 4.79, SD = 1.29; $t(398)$ = -3.87, $p < .001$). Similarly, in the recipient condition, reputational benefits were higher for the prosocial (vs. selfish) incentive ($M_{Selfish}$ = 5.40, SD = 1.16 vs. $M_{Prosocial}$ = 4.95, SD = 1.29; $t(391)$ = -3.64, $p < .001$).

Relationship Benefits. We observed a significant main effect of incentive type on ratings of relationship benefits; following through with a selfish rewards resulted in higher relationship benefits than prosocial rewards ($F(1, 795)$ = 30.15, $p < .001$). There was also a significant effect of participant role on relationship benefits ($F(1, 795)$ = 5.97, p = .015). However, there was a non-significant interaction between the incentive type and role ($F(1, 795)$ = .09, p = .76). For participants in the referrer condition, relationship benefits were significantly higher for the prosocial incentive than the selfish incentive ($M_{Prosocial}$ = 4.62, SD = 1.09 vs. $M_{Selfish}$ = 4.22, SD = .95; $t(399)$ = -4.64, $p < .001$). Similarly, participants in the recipient condition, believed that relationship benefits would higher when offered a prosocial incentive ($M_{Prosocial}$ = 4.76, SD = 1.00 vs. $M_{Selfish}$ = 4.41, SD = .78; $t(393)$ = -3.92, $p <.001$).

Psychological Costs. There was a marginally significant main effect of incentive type on psychological costs ($F(1, 791) = 2.84$, $p = .092$) and a significant main effect of participant role on psychological costs ($F(1, 791) = 10.52$, $p = .001$). We also found a significant interaction between incentive (selfish vs. prosocial) and role; ($F(1, 791) = 20.89$, $p < .001$). For participants in the referrer condition, psychological costs were significantly higher for the selfish incentive than the prosocial incentive ($M_{Selfish} = 2.45$, $SD = 1.61$ vs. $M_{Prosocial} = 1.85$, $SD = 1.41$; $t(392) = 3.91$, $p < .001$). For participants in the recipient condition, psychological costs for not following through were higher for the prosocial incentive ($t(391) = -2.42$, $p = .016$).