

On the Relative Efficiency of Performance Pay and Social Incentives

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Abstract

In contrast to the simplifying assumption of selfishness, social incentives have been shown to play a role in economic interactions. Before incorporating social incentives into models and policies, however, one needs to know their efficiency relative to standard pay-for-performance incentives. We report evidence from a large field experiment comparing the effectiveness of contingent and non-contingent (“social”) incentives in eliciting costly effort. The company with which we worked sent 7,250 letters asking customers to complete a survey. Some letters contained cash amounts ranging from \$1 to \$30, whereas others promised to pay upon compliance. We compare the response rates and cost effectiveness of these contingent and social incentives with each other and with a no-incentives control. In line with previous findings, we find that social incentives generated some effort: small amounts increased the response rate with respect to the control, but the size of the reward had a relatively minor effect. In contrast, the response rate for contingent incentives was low for small amounts but increased rapidly as incentives increased. Importantly, for (almost) any given response rate social incentives were more costly than contingent incentives.

Key words: contingent incentives; gift exchange

1. Introduction

How important are social incentives in economic behavior? A common simplifying assumption in economics is that people are selfish and only direct extrinsic incentives are important. A growing literature in experimental economics questions the validity of this assumption, showing that individuals may sometimes perform costly activities just to help someone else or out of reciprocity.¹

Demonstrating social incentives outside of the laboratory, Falk (2007) found that reciprocity can be effective in increasing charitable donations. He approached previous donors to a charitable organization by mail with a contribution request. Some of the requests included no gift; others included either one or four postcards drawn by children as a non-contingent gift. The main result was that enclosing non-contingent gifts was effective in increasing donations, and donations increased with the size of the gift.² This result is a good example for situations in which social incentives play a role in economic interactions.

Yet to change the way economists think about incentives, showing that social incentives affect behavior is not enough. One also needs to demonstrate that such incentives may result in increased efficiency relative to the straightforward incentives that are contingent on performance. Even in labor markets, where social incentives may have the strongest effect, selfish-maximizing behavior seems to do a good job at incentivizing workers (e.g., Prendergast, 1999; Lazear, 2000).

In this paper, we contrast contingent and non-contingent (social) incentives in an

¹ See, for example, Akerlof (1982); Fehr, Kirchsteiger, and Riedl (1993); Bewley (1999); Fehr and Gächter (2000); Charness and Haruvy (2002); Charness (2004); Sobel (2005); Della Vigna (2009).

² This result is in line with a large body of literature that studies the effectiveness of rewards in generating replies to surveys (e.g., Church, 1993; Dillman, 2000; Singer, 2002).

effort to find the conditions under which each type of incentive is more effective in generating a higher response rate. We base our data on a large study (29 treatments with 7,250 participants) a chain-store company conducted with its club members. The company sent letters asking club members to complete a 15-minute survey, and varied the amount of money (from \$1 up to \$30) and whether incentives were contingent on completing the survey.

Our main result is that both contingent and social rewards help increase response rates, but that traditional contingent incentives are much more cost-effective. The richness of our design allows us to compare both types of incentives for a larger set of reward sizes than previously studied in the literature. In terms of response rates, we find that for large rewards, contingent incentives are superior to social incentives. In terms of cost effectiveness, we find that for almost any response rate the company may want to achieve, contingent incentives are more cost-effective than social incentives. This is due to the fact that social incentives require paying all costumers, even those who do not respond to such incentives. Thus, the total cost in the social treatments was almost three times higher than in the contingent treatments (\$38,820.25 vs. \$13,212.5), although the former only produced 35.71% more completed surveys. The average cost of a returned survey in the social treatments was \$45.40, compared to \$20.97 in the contingent treatments.

Our findings are in contrast with the marketing literature on survey response that concludes that non-contingent amounts of enclosed cash increase response rates and are superior to contingent rewards (see Yammamiro et al., 1991; Church, 1993; Dillman, 2000; and Singer, 2002). Their conclusions are based on studies where the maximum

reward offered is typically not higher than \$10, and average payments are around \$2 (Jobber et al., 2004). According to survey articles by Church (1993) and Jobber et al. (2004), the vast majority of survey studies are done with either no incentives or non-contingent monetary incentives.

Our study involves a large and diverse group of participants who made choices in their natural environment, unaware of their participation in an experiment, with relatively high stakes (up to \$30) and choices that involved real effort. On a conceptual level, researchers have observed gift exchange in the lab, starting with Fehr, Kirchsteiger, and Riedl (1993), and in the field (e.g., Falk, 2007). Yet other studies (Gneezy and List, 2006; List, 2006; Levitt and List, 2007; Benz and Meier, 2008; Della Vigna 2009). question whether the laboratory findings are readily transferred outside the lab. Our results contribute to this discussion by showing that even when incentives that are based on social preferences work in the field, they are not necessarily more effective than traditional incentives that are based on performance.

2. Experimental design and behavioral predictions

A large chain store that operates all over the United States conducted the study in the fall of 2006. The company conducts regular survey studies among members of its shopping club. Membership in this club allows costumers to enjoy discounts on their shopping in the store. In addition, members receive monthly mailings that include coupons for further discounts and information regarding the store.

The survey followed the guidelines of the Total Design Method (Dillman, 1978).³ It

³ The Total Design Method is defined as “identifying each aspect of a survey process affecting either

included a cover letter that explained the purpose of the survey (marketing). The letter ensured participants confidentiality and asked them to complete a 15-minute survey regarding their shopping habits. Participants were then asked to return the survey in an enclosed postage-paid envelope. The survey was two double-sided pages and contained 40 questions. The current study presents all the data the company allowed us to use.⁴

The company frequently uses monetary incentives to achieve a high response rate. The data we report in this paper are based on a pilot study conducted to understand how varying amounts of incentives and methods of payment affect response rate. Roughly half of the participants (3,500) received cash. The cover letter explained the money was given in appreciation of the customer's efforts and was not conditioned on his or her response. A second group of 3,500 participants did not receive any cash in the envelope; instead, their cover letter promised they would be paid by mail once the company received the completed survey. The letter to the remaining 250 subjects did not include or mention any rewards either before or after completion of the survey. Apart from the sentence explaining the presence or not of incentives, all other aspects of the cover letter were identical.

Participants in the experiment were assigned randomly to different treatments using only their club membership numbers, which are also generated randomly when one becomes a member of the club. A total of 7,250 subjects were assigned to one of 29 treatments, with 250 participants per treatment. As mentioned, participants in the control treatment received no incentives. They were asked simply to complete the survey and

quality or quantity of response and modify it to obtain the best possible responses and then organize survey efforts so design intentions are carried out in complete detail".

⁴ We are aware that the potential availability of similar data including individual characteristics would allow us to enrich the present study.

send it back in the enclosed postage-paid envelope.

Each of the other 28 treatments included either contingent or non-contingent incentives. The size of the incentives in each of these groups was \$1, \$2, . . . , \$10, \$15, \$20, \$25, and \$30, resulting in a total compensation of \$46,988. Because a few million people are in this club and the survey sampled members from all over the United States, we can assume participants were unaware of the incentive structure offered to other participants.

3. Results

Our results focus on response rates and on cost effectiveness for a given response rate. Our research interest lies in whether social incentives activate a higher percentage of the population to respond than traditional contingent incentives. Thus, this is not a consulting job for us and therefore, we are not interested in the cheapest method to obtain a certain number of responses from the population. As it will be straightforward in section 3.2, given the low cost of soliciting responses, if the firm was just interested in obtaining a certain number of responses at the lowest cost, they would just do a massive mailing to a large population offering no incentives at all.

3.1 Response rate

Figure 1 presents the response rates in different treatments. Table A1 in the Appendix shows the detailed data.

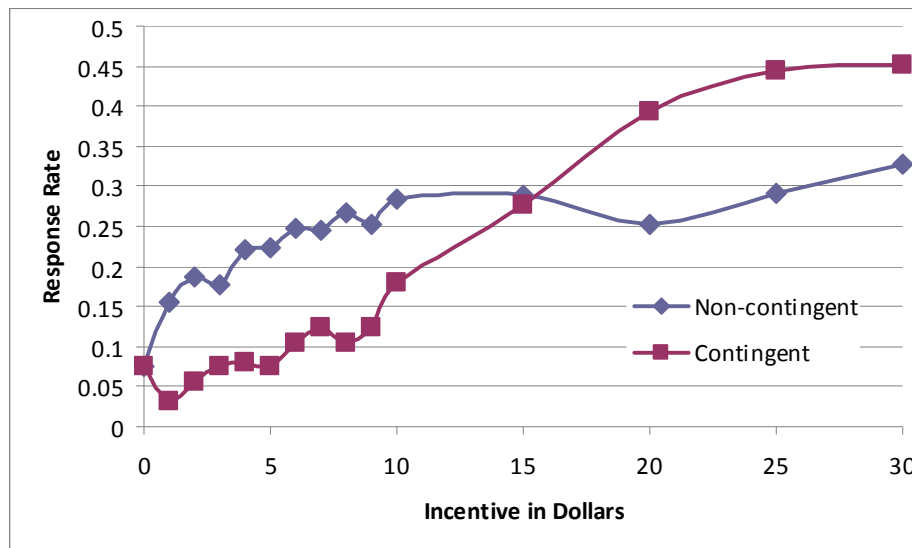


Figure 1: Response rates in the different treatments

The response rate in the control treatment with no incentives is 7.6%. Offering rewards increased response rates for contingent as well as social incentives. For rewards below \$15, social incentives resulted in higher response rates than contingent incentives. However, from \$10 onward, increasing the social incentive increased the response rate slightly, whereas increasing the contingent incentive increased the response rate significantly. We found almost a 50% higher response rate for the contingent incentives (32.8% vs. 45.2%) for the \$30 treatments.

A comparison of each of the pairs of payoffs (i.e., the same level of incentives either under contingent or social incentives) reveals interesting patterns. Two-tailed z-tests at the 1% level comparing response rates for each pair show that the only non-significant difference in proportions occurs in the \$15 treatments (response rates of 28.88% for social and 27.6% for contingent incentives). Lower payoffs produced higher response rates for social incentives, whereas higher payoffs (greater than \$15) produced higher response rates for contingent incentives.

For the social incentives treatments, the response rate doubled in the \$1 treatment relative to the control (15.6% vs. 7.6%; significant at 1% level using a two-tailed z-test for differences in proportions, z -value= 2.653). For higher incentives, the test for differences in proportions at the 5% level shows no significant effect between each incentive size and the subsequent incentive size. However, as can be seen in Figure 1, the response rate at the \$30 non-contingent level (32.8%) is double that of the \$1 (15.6%) treatment. This difference is statistically significant at the 1% level. Testing differences at five-dollar intervals shows no significant effect at the 1% level. This finding allows us to conclude that although the response rate increases with the size of social incentives, the slope is relatively flat and has a limit at around a 30% response rate. This result is consistent with Armstrong (1975), Moser and Kalton (1976), and Jobber and Saunders (1988) who, using much less variability and smaller incentives, argue that the mere act of giving an incentive has a major impact and a relatively low sensitivity to size.

In the contingent treatment, the response rate actually decreased by half with respect to the control treatment when \$1 was offered (7.6% vs. 3.2%; significant at the 5% level using a two-tailed z-test, z -value= 1.98), showing evidence of crowding out (Gneezy & Rustichini, 2000). For higher incentives, the response rate was relatively flat up to \$10. Pair-wise z-tests in response rates between each incentive size and the subsequent incentive size are not significant at the 5% level. However, differences are significant when comparing \$5 with \$10, \$10 with \$15, and \$15 with \$20. Finally, z-tests confirm that the response rate flattens from \$20 onward.

Probit regressions (Table 1) for the contingent and social treatments, where the dependent variable is a dummy that takes a value of 1 if the participants returned the

survey and 0 if not, confirm these findings. The independent variable “No incentive” takes value 1 when no incentive was offered and 0 otherwise. This dummy variable is statistically significant at the 1% level in the social treatment but not in the contingent treatment. The independent variable “Incentive” captures the marginal increase in the response rate for any additional amount of reward and is positive and significant at the 1% level in both treatments.

	Non- Contingent	Contingent
Dependent Variable	Donation Dummy	Donation Dummy
No incentive	-0.593*** (0.122)	0.184 (0.126)
Incentive	0.014*** (0.002)	0.057*** (0.002)
Constant	-0.840*** (0.037)	-1.616*** (0.045)
Number of Observations	3750	3750
Probit regression with standard errors in parenthesis. *** indicates significance at the 1% level.		

Table 1: Treatment Differences in Probability of Responding

As Titmuss (1970) hypothesized in the case of blood donation, the use of contingent incentives may affect the selection of people who participate and even the quality of their responses. Using the company’s own criteria, we have a measure of the quality of the completed surveys. This measure is based on whether all answers were completed, and on a “trick” question included to make sure participants read the whole survey carefully. The average quality of returned surveys was high (average of 0.80 in a [0,1] interval). We do not observe significant differences in the quality of the returned

surveys across treatments since variation across treatments was low (Min= 0.64, Max=0.92, Standard deviation = 0.068).

3.2 Effectiveness and costs

We now turn to the cost-benefit analysis associated with each treatment. The company launched this experiment to learn how different incentives affect response rates. It then used this knowledge to choose the relevant incentive level and method for new surveys.

The cost of the survey includes the different incentives provided plus the mailing costs. The company estimated the marginal cost of each survey request at 60 cents, whereas the mailing cost of returned surveys was 55 cents. In the contingent treatments, sending the money to compliant customers added an additional mailing cost of 55 cents. Table A2 in the Appendix shows the total cost per treatment as well as the unitary cost per completed survey in each treatment. Because the company enclosed the payment in every request in the social-incentives treatment, while sending it only to people who completed the survey in the contingent-incentives treatment, the total cost in the social-incentives treatments was almost three times higher than in the contingent treatments (\$38,820.25 vs. \$13,212.5). Yet the former only produced 35.71% more completed surveys. The average cost of a returned survey in the social treatments was \$45.40, compared with \$20.97 in the contingent treatments. The average cost in the control treatment was \$8.44, as it only included request and mailing costs.

Figure 2 shows the unitary cost per survey returned for each incentive condition. Unitary costs steadily increased with the size of the incentive in the social-incentives

treatments. The low return rate when \$1 was offered upon compliance in the contingent treatment made the initial unitary cost higher than in the social treatment. However, the contingent unitary cost dropped below the social-incentives treatment when incentives equaled \$2 (\$14.38 for non-contingent vs. \$13.41 for contingent), and its increasing slope is lower than in the social-incentives treatment. Therefore, the unitary cost of each returned survey was always lower (from \$2 onward) with contingent incentives than under social incentives.⁵ In fact, the difference in unitary costs between the two treatments increased with the size of the incentive.

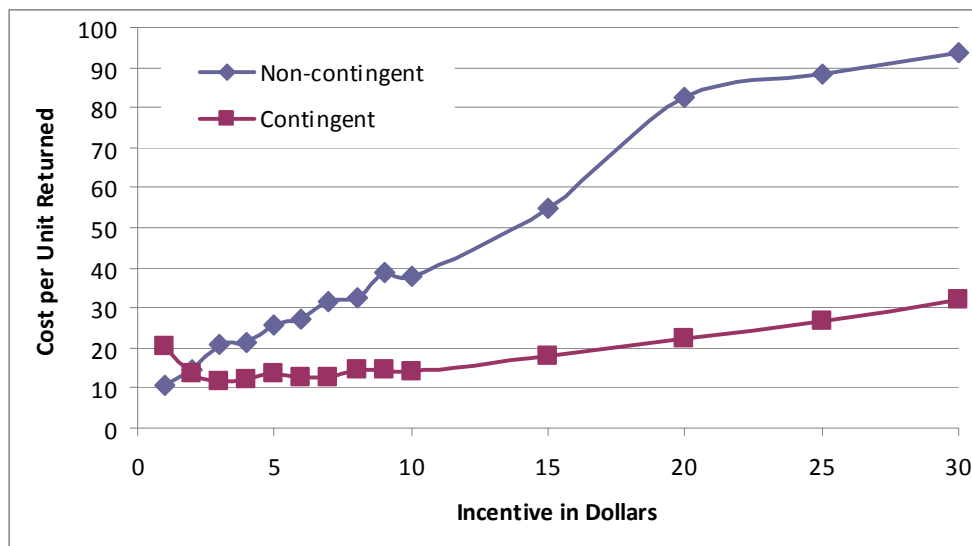


Figure 2: Cost per returned survey

Figure 3 presents the response rate as a function of the unitary cost per returned survey both for contingent and non-contingent incentives. Notice that only for response

⁵ Unitary costs for non-contingent incentives are minimized by enclosing \$1 while unitary costs for contingent incentives are minimized by offering \$3 per returned survey. Given these unitary costs and the differences in response rates, if one were interested in obtaining one response, it would be better to pay \$1 non-contingent incentives to 6.25 people than \$3 to the one participant who returned the survey. However, it would be best to not pay any incentive at all and obtain one response by sending 13.2 non-incentivized requests.

rates below 15 percent non-contingent incentives are more cost effective. Given that the response rate in the non-contingent treatment is relatively flat, contingent incentives are more cost effective for any response rate above 15 percent. For example, in order to double the response rate to around 30 percent, the unitary cost is almost five times higher with non-contingent incentives than with contingent incentives (response rate of 29.2% with non-contingent incentives and unitary cost of \$88.22 versus response rate of 27.6% with contingent incentives and unitary cost of \$17.75).

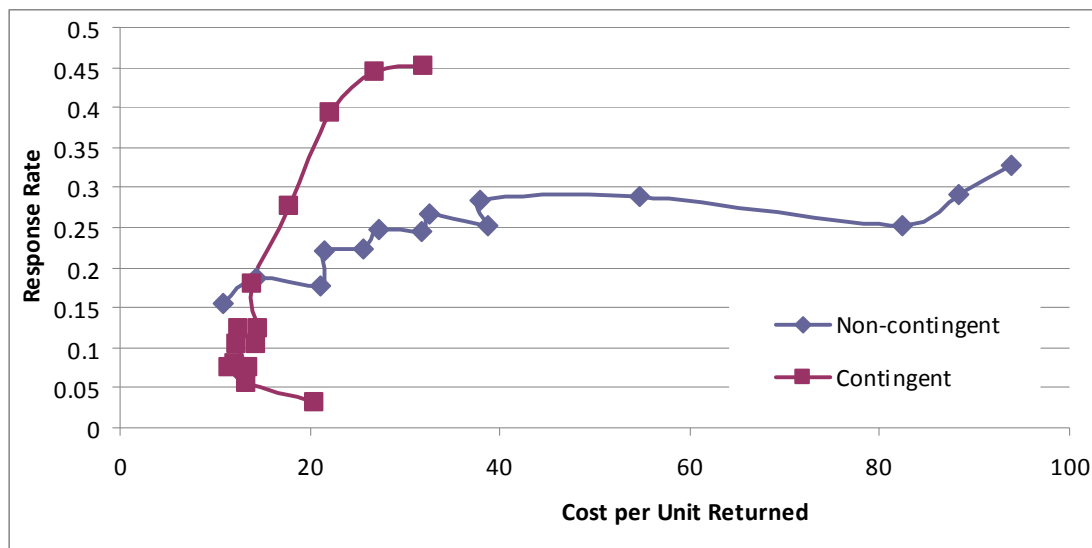


Figure 3: Response Rate as a Function of the Unitary Cost

Discussion

We report results from a large field experiment with different levels of contingent and non-contingent (social) incentives. As in previous studies, mostly lab experiments, we observe that social incentives can be an effective way of eliciting costly effort from individuals. However, using variation in the size of incentives offered and larger rewards than previously used in the literature, we find that this exercise costs more than the

traditional pay-per-performance incentives. In the end, social incentives are less efficient than traditional contingent incentives.

This result demonstrates that social rewards are effective in soliciting effort but are limited in scope. A possible explanation is that a fraction of the population is reciprocal and reacts to social incentives out of, for example, guilt aversion. The rest of the population, however, does not. Once the reciprocal population is exhausted with high-enough social incentives, this form of compensation becomes ineffective in soliciting effort.

The results show that even if social incentives are important in several situations, their use in economic interactions may be limited due to the relatively higher cost of eliciting effort without contingent payoffs.

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Appendix

Table A1: Response Patterns in the Contingent and Non-contingent Treatments				
n=250	Number of Responses		Frequency	
Incentive	Non-contingent	Contingent	Non-contingent	Contingent
1	39	8	0.156	0.032
2	47	14	0.188	0.056
3	44	19	0.176	0.076
4	55	20	0.220	0.080
5	56	19	0.224	0.076
6	62	26	0.248	0.104
7	61	31	0.244	0.124
8	67	26	0.268	0.104
9	63	31	0.252	0.124
10	71	45	0.284	0.180
15	72	69	0.288	0.276
20	63	98	0.252	0.392
25	73	111	0.292	0.444
30	82	113	0.328	0.452
N	855	630	0.244	0.180

n=250	Total Cost		Cost per Unit Returned	
Incentive in Dollars	Non-contingent	Contingent	Non-contingent	Contingent
1	421.45	164.4	10.81	20.55
2	675.85	187.7	14.38	13.41
3	924.2	219.45	21.01	11.55
4	1180.3	243	21.46	12.15
5	1430.8	257.45	25.55	13.55
6	1684.1	322.3	27.16	12.40
7	1933.6	386.05	31.70	12.45
8	2186.9	374.3	32.64	14.40
9	2434.7	448.05	38.65	14.45
10	2689.1	626.75	37.87	13.93
15	3939.6	1225	54.72	17.75
20	5184.7	2165.9	82.30	22.10
25	6440.2	2988.1	88.22	26.92
30	7695.1	3604.2	93.84	31.90
Average	-	-	45.40	20.97