

# Incentives to Participate in Online Research: An Experimental Examination of “Surprise” Incentives

Andrew T. Fiore  
Facebook, Inc.  
& UC Berkeley  
atfiore@fb.com

Coye Cheshire  
School of Information  
UC Berkeley  
coye@ischool.berkeley.edu

Lindsay Shaw Taylor  
Dept. of Psychology  
UC Berkeley  
shawtaylor.lindsay@gmail.com

G.A. Mendelsohn  
Dept. of Psychology  
UC Berkeley  
jermend@berkeley.edu

## ABSTRACT

The recruitment of participants for online survey research presents many challenges. In this work, we present four experiments examining how two different kinds of “surprise” financial incentives affect the rate of participation in a longitudinal study when participants are initially solicited with either an appeal to intrinsic motivation to participate in research or one that also offers extrinsic financial incentives. We find that unexpected financial incentives (“existence surprises”) presented to people who click a recruitment advertisement focused on intrinsic incentives lead to a lower recruitment rate than do the same incentives offered to those who clicked an advertisement that led them to expect it. However, when potential participants expect a financial incentive, surprising them with a higher amount (“amount surprises”) yields a higher recruitment rate. We interpret these results in the context of crowding theory. Neither type of surprise affected ongoing participation, measured as the number of questions and questionnaires completed over the course of the study.

## Author Keywords

Incentives; Motivation; Online research recruitment.

## ACM Classification Keywords

H.5.m. Information interfaces and presentation (e.g., HCI): Miscellaneous.

## INTRODUCTION

Surveys are an important and increasingly pervasive part of the arsenal of tools employed by HCI researchers, as well as information, computer, and social scientists more broadly (cf. [23]). Even as large-scale behavioral data analysis provides powerful insights into *what* people are doing with computational systems, surveys provide complementary information about *why* and *how* people behave as they do.

Best practices for recruiting participants for postal mail,

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telephone, and face-to-face surveys have much in common with those for online surveys (cf. [12]). Yet recruiting participants in online environments also presents new challenges, such as how to format and deliver surveys and reminders and what kind of bias to expect in terms of who responds [14]. At the same time, web-based surveys offer enormous advantages to researchers who might otherwise lack the financial resources to conduct large-scale population studies [36].

For such researchers, it is important to understand how different kinds of incentives and the manner in which they are presented might promote or depress interest, recruitment, and ongoing participation among participants who may have varying motivations for taking part in a study. Crowding theory [11, 15, 24, 30] offers a framework not previously applied in the context of large-scale research recruitment for understanding how extrinsic financial incentives may “crowd out,” or displace, intrinsic motivation, whereas the same incentives may “crowd in,” or amplify, existing extrinsic motivation.

In this paper, we present four experiments to examine the impact of two levels of extrinsic financial incentive (\$15 and \$60, paid in three installments) combined with four different recruitment ads, varying in their appeals to intrinsic or extrinsic motivations to participate in research, on the participation rate in a longitudinal survey study. In particular, we focus on two kinds of incentive surprises: the “existence surprise,” when a financial incentive is revealed to participants who were not expecting one, and the “amount surprise,” when a financial incentive is expected but the amount is higher than participants were led to anticipate.

We find that “existence surprises” have little benefit with respect to successful recruitment into a study and, at the lower incentive level, in fact incur some penalty as compared to offering the same amount advertised in advance, consistent with a “crowding out” effect. By contrast, “amount surprises” yield higher recruitment rates as compared to the same financial incentive presented up front, consistent with extrinsic motivation being “crowded in.”

## SURVEY RECRUITMENT AND INCENTIVES

Techniques for recruiting survey participants have a long history of adapting to new media, from the use of postal mail to the telephone and now the Internet. Throughout this

progression, researchers have strived to maximize response rates in order to reach representative samples efficiently. Yet as Tourangeau [33] discusses, response rates have declined in recent years due to a number of factors: greater difficulty in reaching potential participants, due to societal changes such as the increase in people living alone and technological changes like caller ID; more people declining to participate once contacted; and more people proving unable to participate, perhaps due to language barriers arising from demographic shifts.

Potential participants may have a variety of reasons for choosing to participate in a survey or to decline — no survey or incentive will be universally compelling. Different respondents may value the relevance of the survey's topic to them, the effort involved in participating, the worth of incentives offered, and the merits of the organization conducting the survey differently in making their participation decisions [19]. In the present study, we hold constant the topic, effort, and the sponsoring organization and focus on how extrinsic incentives shape these decisions when paired with advertisements invoking intrinsic and extrinsic motivations in the context of an online survey.

#### **Incentives for Participation**

Survey researchers often provide material or financial incentives as well as the promise of contributing to the advancement of scientific knowledge in exchange for respondents' time and willingness to answer questions. However, differences in how and when individuals are compensated for survey participation can sometimes dramatically affect how the incentives influence recruitment and retention. In mail surveys, pre-paid financial incentives, such as a dollar bill in the envelope with the survey, significantly increase participation, but payment upon completion typically does not [9, 31]. Church found that pre-paid incentives generated an average increase in response rate of 19% [9]. Some researchers focusing specifically on online surveys have found both pre-paid and post-paid incentives to be largely ineffective [4], though others suggest that post-paid incentives have more potential in online contexts than they do offline [13]. Indeed, post-paid £10 electronic gift cards offered in a follow-up online survey invitation produced response rates 9% higher as compared to participants offered no incentive, although no such effect was found with smaller £5 incentives [22]. Mixing online and postal-mail messages with pre-paid cash incentives showed promise for recruiting online respondents, although overall recruitment rates may still lag behind those resulting from mail messages alone [28, 29].

Lottery draws, in which an extrinsic incentive is awarded to a randomly selected subset of participants after completion of the survey, seem to be more effective in boosting participation in online surveys [16, 4, 35, 20]. A meta-analysis of studies using predominantly lottery-style material incentives conducted by Göritz [18] found that, on

average, the incentives led to a 2.8% increase in initial response rate and a 4.2% increase in retention rate over conditions without incentives, though as Fan and Yan [14] and Messer and Dillman [28] point out, this is a modest effect. Lottery draws can be more cost-effective than paying every participant, as even very small payments of US\$10 or less quickly become prohibitively expensive with the large sample sizes that survey researchers often seek [10].

Material incentives can take many forms: goods, services, cash, check, or other financial implements such as gift certificates or pre-paid debit cards. The latter are not necessarily equivalent to their nominal cash value — indeed, Birnholtz and colleagues [2] found that US\$5 gift certificates, whether delivered by postal mail or email, induced significantly lower participation rates than did US\$5 in cash. For online research, however, cash is impractical; incentives that can be delivered electronically are faster and easier for both researchers and participants [14].

#### **Intrinsic and Extrinsic Motivation**

Although material incentives have the potential to increase participation under the right circumstances, one concern for researchers is that they might at the same time undermine individual motivations to participate in scientific research if they are seen as a controlling or even coercive enticement to elicit responses or behaviors for researchers. Moreover, respondents who seek material compensation may differ in important ways from those who participate out of their desire to add to scientific knowledge or support the aims of the organization conducting the survey. The concern regarding the impetus to participate in research can be considered in terms of a tradeoff between extrinsic and intrinsic motivations for taking part in a study. Extrinsic motivations are those that can be satisfied through indirect compensation, usually financial in nature [30]. On the other hand, intrinsic motivations are a more direct form of compensation, “undertaken for one's immediate need satisfaction” [30] (p. 539). Intrinsic motivations include doing tasks for their own sake, for a sense of accomplishment, or for obligations associated with one's personal identity [26]. We define intrinsic and extrinsic incentives as those that appeal, respectively, to intrinsic and extrinsic motivations.

It is important to note that some researchers use these terms somewhat differently; for example, Tuten and colleagues [34] take intrinsic cues to be those central to the recruitment message and extrinsic cues to be peripheral to it, including not only material prizes but also pleasing sounds and colors in the recruitment advertisement. Despite this conceptual difference, Tuten and colleagues operationalized intrinsic and extrinsic approaches to recruitment similarly to the present study, with advertisements for the “opportunity to contribute to an important study” vs. the “opportunity to win valuable prizes” [34] (p. 18).

### *Crowding theory*

Motivation is neither strictly individual nor strictly situational; instead, it depends on the interplay of individual value disposition (cf. Bilsky and Schwartz [5]) with situational factors such as the type of incentives offered and whether they match the individual's expectations. Extrinsic incentives can increase participation for some individuals, yet research shows that extrinsic rewards can lead to *lower* participation when they "crowd out" — that is, dampen or displace — one's own intrinsic motivation [11, 24, 30]. For example, a small payment for a task one was willing to do anyway may seem at best unnecessary and at worst insulting; relatedly, a token financial incentive may seem to assign a low value to a task with inherent non-financial worth. However, the opposite can also occur ("crowding in") if the extrinsic incentive increases the perceived marginal financial benefit of performing the task [15]. In addition, non-financial (e.g., social) incentives can enhance intrinsic motivation, such as reputation from one's peers or recognition of unique contributions, leading to increased participation without crowding out existing motivation [7, 8, 25, 32].

### **AN EXPERIMENTAL EXAMINATION OF "SURPRISE" FINANCIAL INCENTIVES**

We present a series of four experiments to examine the effects of incentives on survey participation as part of an extensive web-based longitudinal survey project. Our primary research goal is to investigate the effect of "surprise" financial incentives — that is, those not initially advertised or different from what was advertised — on the following outcomes of interest among participants initially solicited by different advertisements designed to appeal to intrinsic and extrinsic motivations:

- (1) Rate of **interest** in learning more about the study
- (2) Rate of successful **recruitment** into the study
- (3) Amount of **ongoing participation** in the study
- (4) **Cost effectiveness** in generating responses

We operationalize *interest* as the click rate on the recruitment ads, computed by measuring the fraction of targeted users who clicked a recruitment ad. We calculate the *successful recruitment rate* as the fraction of ad-clickers who completed informed consent and an intake questionnaire, which was presented immediately afterwards. We measure *ongoing participation* in two ways: the number of questionnaires completed and the total number of questions answered over the course of the study. Finally, we assess the *cost effectiveness* of different incentives with respect to the outcomes above by computing the number of recruited participants per \$1000 spent, the per-participant average incentive value paid per completed question, and the across-participants cost per 100 questions answered.

Based on the logic of crowding theory described above, we expect to find evidence of crowding out in the form of decreased participation when individuals are recruited

*solely* through a request to be part of social research (intrinsic incentive) but later discover that they will be paid for their effort after they have already shown interest in participating. Second, when individuals are recruited with a promise of extrinsic financial compensation from the beginning, we expect higher levels of subsequently revealed extrinsic financial compensation to "crowd in" — that is, amplify — existing motivation to participate.

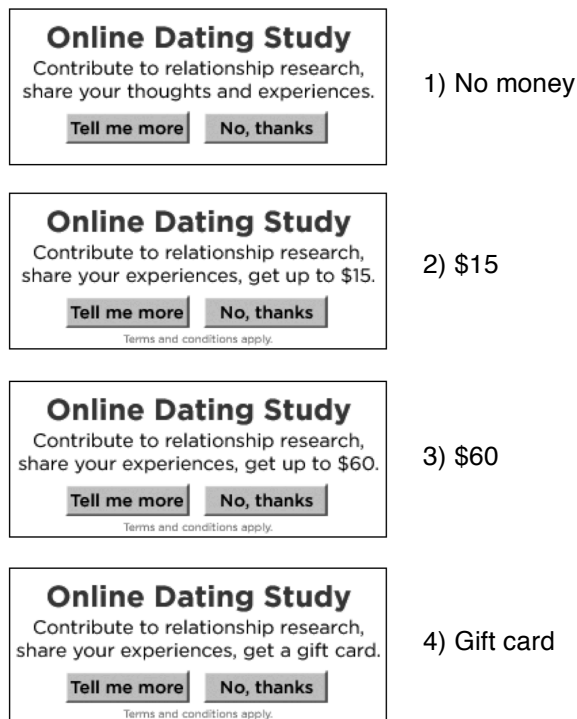
This work consists of theoretically informed field experiments, but we do not make separate theoretical hypotheses for all of the various conditions in our experiments. Instead, our intention is to explore the results of our experiments in light of our baseline predictions. The purpose of this research is primarily to examine the relationship between intrinsic and extrinsic motivations to participate in research and to help researchers make informed decisions about incentives and recruitment in web-based surveys and other forms of research requiring the solicitation of participants. Additionally, this study adds to the growing collection of empirical research on intrinsic and extrinsic incentives and how they interact in observed social behavior.

### **Method Overview**

Through a partnership with a large American online dating site, we recruited participants for a longitudinal study of online relationship formation through "pop-over" advertisements that appeared on users' screens when they visited the dating site during several one-week periods in 2009 and 2010. We conducted four experiments, described below, in different waves of recruitment for this online dating study, using two combinations of advertisement and incentive in each experiment.

Each person was assigned to only one condition across all four experiments reported below; that is, there was no overlap in samples among the experiments. Potential participants were shown at most one ad during the recruitment period for their wave. Only those who visited the site during that period had the opportunity to see an ad. A button on each ad labeled "Tell me more" took users to the informed consent page, while a button labeled "No, thanks" closed the advertisement.

Users who clicked "Tell me more" were presented with an informed consent page, which explained that the study would last several weeks and would involve several questionnaires during the study period about attitudes, dispositions, and behaviors related to online relationship formation. Those who agreed to participate were taken immediately to the first questionnaire. Periodic follow-up emails were sent to notify participants when new questionnaires were available, which a state machine determined based on participants' previous responses, and to remind them of pending questionnaires. All participants were sent at least three questionnaires, and those who continued responding were sent as many as 17; the same state machine rules for questionnaire assignment were used



**Figure 1. Recruitment advertisements**

in all conditions of the experiments reported here. Participants were free to withdraw via our web site at any time, at which point we would stop sending them emails.

#### *Recruitment Ads*

Across the four experiments, we used four different recruitment ads to invite users of the dating site to participate in the study. Some participants saw an ad that made no mention of money (even though some would learn later that they would receive gift cards), while others saw ads promising a gift card or ads that mentioned US\$15 or US\$60 amounts specifically. The “no money” advertisement asked potential participants to “Contribute to relationship research, share your thoughts and experiences.” Thus, we consider the no-money message to be an appeal to intrinsic motivations only. The three other advertisements also asked potential participants to “Contribute to relationship research, share your experiences” but explicitly offer a gift card or a quantity of money (“get a gift card,” “get up to \$60”). We consider these three messages to appeal to both intrinsic and extrinsic motivations. The four different recruitment ads are displayed in Figure 1.

#### *Financial Incentives*

Financial incentives were offered to participants in the form of Amazon.com gift codes. These gift codes were delivered via email and could be entered into Amazon.com to use their value immediately. We chose incentive values of \$15 and \$60 to represent typical and unusually high levels of compensation for an online study. Furthermore, we designed a payment schedule to strike a balance between immediate reward and longer-term incentive for continued

participation in a longitudinal sequence of questionnaires. Payments were scheduled so that participants would receive part of their payment shortly after completing the first questionnaire and the rest after they responded to requests for follow-up questionnaires during a six-week period. All participants who met these milestones received the promised payment amounts. Participants in a \$60 incentive condition received \$30 upon completing the first questionnaire and two additional \$15 payments at three weeks and six weeks from their start date if they continued participating by answering at least one questionnaire in each three-week period. Those in a \$15 incentive condition were paid \$5 at first followed by two \$5 payments at three weeks and six weeks.

#### *Experimental Conditions*

The conditions in the following experiments resulted from various combinations of the four recruitment advertisements with either the \$15 or \$60 financial incentives, as described in detail for each of the experiments below. We employed only combinations in which the payment was *at least as much as promised in the ad*. That is, some participants learned after clicking on the ad that they would be getting a financial incentive when none had been mentioned in the ad or that they would get a larger incentive than promised by the ad, but they were never offered less than what the ad stated. Although these conditions involve a form of deception, the ultimate offer was always more favorable than the initial promise in terms of financial incentives, not less.

The combinations that offered a greater incentive than what the ad promised are what we consider the “incentive surprise” conditions. Conditions with “no money” recruitment ads that later revealed a financial incentive (\$15 or \$60) after the potential participant clicked on the ad are examples of an “existence surprise” (Experiments 1 and 2). An ad mentioning \$15 paired with a subsequently revealed \$60 incentive is slightly different: it offered a higher actual payment than the *specific amount* shown on the advertisement, an “amount surprise” (Experiment 3). In this case, the *fact* of a financial incentive is not a surprise, but the *amount* is. Moreover, for this condition, we can easily identify the exact difference between the payment users expected when choosing to learn more about the study and what they expected when agreeing to participate (\$60 – \$15 = \$45). A different kind of “amount surprise” is presented in Experiment 4, where an ad promising a financial incentive of unspecified value is paired with two different levels of incentive — here, the surprise is contingent on what people expect the amount to be for a typical study.

#### *Sampling and Assignment*

The design of the online dating study required that we recruit waves of participants in geographic clusters within the United States. These geographic clusters varied in size, so the total sample size varies among the experiments presented here. For each experiment, all users of the dating site within

	Condition		
	1A	1B	
Incentive offered in ad	None	\$15	
Actual incentive	\$15	\$15	
Targeted <i>N</i>	38,536	38,395	
Click rate	1.45%	1.69%	**
Clicked <i>N</i>	558	648	
Recruitment rate (among clicked)	33.9%	41.2%	*
Recruitment rate (among targeted)	0.49%	0.70%	
Recruited <i>N</i>	189	267	
Questionnaires completed ( <i>M</i> and <i>SD</i> per recruited)	4.57 [3.08]	4.43 [2.88]	<i>n.s.</i>
Questions completed ( <i>M</i> and <i>SD</i> per recruited)	128.2 [85.7]	133.0 [87.6]	<i>n.s.</i>
Incentive cost per question completed per participant ( <i>M</i> and <i>SD</i> per recruited)	\$0.10 [\$0.04]	\$0.10 [\$0.04]	<i>n.s.</i>
Estimated incentive cost per 1,000 participants	\$12,820	\$13,300	

\*  $p < .05$  \*\*  $p < .01$  \*\*\*  $p < .001$  *n.s.* not significant

Table 1. Results from Experiment 1

	Condition		
	2A	2B	
Incentive offered in ad	None	\$60	
Actual incentive	\$60	\$60	
Targeted <i>N</i>	12,069	11,936	
Click rate	0.89%	1.83%	***
Clicked <i>N</i>	108	218	
Recruitment rate (among clicked)	50.9%	48.2%	<i>n.s.</i>
Recruitment rate (among targeted)	0.46%	0.88%	
Recruited <i>N</i>	55	105	
Questionnaires completed ( <i>M</i> and <i>SD</i> per recruited)	5.33 [3.41]	5.29 [2.94]	<i>n.s.</i>
Questions completed ( <i>M</i> and <i>SD</i> per recruited)	150.7 [95.7]	157.2 [95.4]	<i>n.s.</i>
Incentive value per question completed per participant ( <i>M</i> and <i>SD</i> per recruited)	\$0.42 [\$0.17]	\$0.41 [\$0.18]	<i>n.s.</i>
Estimated incentive cost per 1,000 participants	\$63,294	\$64,452	

\*  $p < .05$  \*\*  $p < .01$  \*\*\*  $p < .001$  *n.s.* not significant

Table 2. Results from Experiment 2

the designated geographic clusters were randomly assigned to one of two conditions. In Experiments 1, 2, and 3, approximately equal numbers of users were randomized into each condition ( $P = .50$ ). For Experiment 4, we employed a weighted randomization process to assign more users to condition A ( $P \approx .95$ ) than to condition B ( $P \approx .05$ ), proportional to the availability of incentive funds.

### Experiment 1: Comparing two ads with the same \$15 incentive

#### Method

All users of the online dating site in a major metropolitan area, approximately 77,000 people (33% female, 61% male, 6% gender unknown; median age 41), were randomly assigned to be recruited with one of two advertisements: (1A) the ad that did not mention money (Figure 1.1), or (1B) the ad offering “up to \$15” (Figure 1.2). After clicking the ad, those in both conditions were offered the \$15 incentive.

#### Results

Condition 1B, with the \$15 ad, yielded higher click and recruitment rates than did condition 1A, with the no-money ad (Table 1). Users targeted with the \$15 ad clicked it 16.6% more often than those targeted with the no-money

ad, 1.69% vs. 1.45%,  $\chi^2(1) = 7.0$ ,  $p < .01$ . After clicking the \$15 ad, users in condition 1B were successfully recruited 21.5% more often than those who clicked the no-money ad (1A), 41.2% vs. 33.9%,  $\chi^2(1) = 6.5$ ,  $p < .05$ .

The average number of questionnaires and questions completed per participant (Table 1) did not differ significantly by condition. The cost of incentives paid per question completed, averaged on a per-participant basis, was the same in both conditions, \$0.10.

#### Discussion

It is not surprising that an ad that offered a financial incentive (1B), appealing to both extrinsic and intrinsic motivations, would generate more interest than one that did not offer a financial incentive and appealed only to intrinsic motivation (1A). However, among those who clicked each ad to find an identical offer of a \$15 incentive, a significantly higher proportion of those who knew about the incentive from the start also went on to join the study. It is possible that the people who clicked the no-money ad were relatively more intrinsically and less extrinsically motivated — whether dispositionally or momentarily — than those who clicked the \$15 ad, leading to a lower recruitment rate when presented with the same financial incentive.

**Experiment 2:  
Comparing two ads with the same \$60 incentive**

*Method*

A random sample of dating site users from 10 U.S. states and 5 additional metropolitan areas, approximately 24,000 people (32% female, 59% male, 9% gender unspecified; median age 41), were randomly assigned to be recruited with one of two advertisements: (2A) the ad that did not mention money (Figure 1.1), or (2B) the ad offering “up to \$60” (Figure 1.3). After clicking the ad, those in both conditions were offered the \$60 incentive.

*Results*

Condition 2B, with an ad that promised up to \$60, resulted in a click rate twice as high (+106%) as in the no-money ad condition, 1.83% vs. 0.89%,  $\chi^2(1) = 38.2, p < .001$  (Table 2). But the percentage of ad-clickers who were successfully recruited did not differ significantly between conditions.

Questionnaires and questions completed per recruited participant did not differ significantly by condition. The cost of incentives paid per question completed was the same in both conditions, just over \$0.40.

*Discussion*

The design of Experiment 2 mirrors that of Experiment 1 but with a \$60 payment and ad instead of a \$15 one. While the click rate for the \$60 ad vs. the no-money ad is unsurprisingly dramatically higher, the recruitment rate among people who click is the same in the two conditions. We might expect the same pattern of results as in Experiment 1 — that people who clicked the no-money ad would not be as motivated by the financial incentive as those who clicked the \$60 ad — but in this case it seems that the substantial value of the incentive was sufficient to override this tendency.

**Experiment 3:  
Comparing two financial incentive ads  
with the same \$60 incentive**

*Method*

A random sample of dating site users from a major metropolitan area, approximately 15,700 people (31% female, 57% male, 12% gender unspecified; median age 41), were randomly assigned to be recruited with one of two advertisements: (3A) the ad offering “up to \$15” (Figure 1.2), or (3B) the ad offering “up to \$60” (Figure 1.3). After clicking the ad, those in both conditions were offered the \$60 incentive.

*Results*

The \$15 and the \$60 ad did not differ by click rate (Table 3). But among those who clicked an ad, those in condition 3A with the \$15 ad were successfully recruited 31.3% more often than those than in condition 3B with the \$60 ad, 57.0% vs. 43.4%,  $\chi^2(1) = 4.7, p < .05$ .

As in previous experiments, the average number of questionnaires and questions completed per successfully recruited participant did not differ significantly by

	Condition		
	3A	3B	
Incentive offered in ad	\$15	\$60	
Actual incentive	\$60	\$60	
Targeted <i>N</i>	7,920	7,757	
Click rate	1.70%	1.84%	<i>n.s.</i>
Clicked <i>N</i>	135	143	
Recruitment rate (among clicked)	57.0%	43.4%	*
Recruitment rate (among targeted)	0.97%	0.80%	
Recruited <i>N</i>	77	62	
Questionnaires completed ( <i>M</i> and <i>SD</i> among recruited)	6.12 [2.78]	5.47 [2.76]	<i>n.s.</i>
Questions completed ( <i>M</i> and <i>SD</i> among recruited)	157.2 [95.4]	150.7 [95.7]	<i>n.s.</i>
Incentive value per question completed per participant ( <i>M</i> and <i>SD</i> among recruited)	\$0.39 [\$0.17]	\$0.41 [\$0.16]	<i>n.s.</i>
Estimated incentive cost per 1,000 participants	\$61,308	\$61,787	

\*  $p < .05$  \*\*  $p < .01$  \*\*\*  $p < .001$  *n.s.* not significant

**Table 3. Results from Experiment 3**

condition. The cost of incentives paid per question completed was also the same in both conditions, approximately \$0.40.

*Discussion*

The two ads in this experiment did not vary in terms of intrinsic vs. extrinsic incentives — both mentioned a financial incentive, in contrast to Experiments 1 and 2, where one of the ads in each study appealed only to intrinsic motivation. Instead, the ads in Experiment 3 varied in terms of the value of the financial incentive offered. The ads did not differ in terms of click rate, but those in the \$15 ad condition who were presumably pleasantly surprised to find after clicking that the true incentive was \$60 were successfully recruited into the study at a significantly higher rate than those who found that they would receive the \$60 incentive they already expected.

**Experiment 4:  
Comparing \$15 and \$60 incentives with the same ad**

*Method*

A random sample of dating site users from 10 U.S. states and 5 additional metropolitan areas, approximately 229,500 people (34% female, 61% male, 5% gender unspecified; median age 41), were recruited with the advertisement offering a “gift card” (Figure 1.4). They were randomly

Incentive offered in ad	Condition		
	4A	4B	
	Gift card	Gift card	
<b>Actual incentive</b>	\$15	\$60	
<b>Targeted N</b>	217,589	11,912	
<b>Click rate</b>	1.48%	1.39%	<i>n.s.</i>
<b>Clicked N</b>	3,220	165	
<b>Recruitment rate</b> (among clicked)	35.2%	55.8%	***
<b>Recruitment rate</b> (among targeted)	0.52%	0.77%	
<b>Recruited N</b>	1,134	92	
<b>Questionnaires completed</b> ( <i>M</i> and <i>SD</i> among recruited)	4.59 [2.98]	4.89 [3.11]	<i>n.s.</i>
<b>Questions completed</b> ( <i>M</i> and <i>SD</i> among recruited)	131.6 [82.3]	135.7 [84.6]	<i>n.s.</i>
<b>Incentive value per question completed per participant</b> ( <i>M</i> and <i>SD</i> among recruited)	\$0.10 [\$0.04]	\$0.45 [\$0.17]	***
<b>Estimated incentive cost per 1,000 participants</b>	\$13,160	\$61,065	

\*  $p < .05$  \*\*  $p < .01$  \*\*\*  $p < .001$  *n.s.* not significant

**Table 4. Results from Experiment 4**

assigned to be offered one of two incentives after clicking the ad: (4A) the \$15 incentive, or (4B) the \$60 incentive.

#### Results

The ads in conditions 4A and 4B did not differ by click rate, as expected because the same ad was used in both conditions. The click rate across conditions was 1.47% (Table 4). However, among those who clicked the ad, the rate of successful recruitment was 58.5% higher when the subsequent incentive offered was \$60 (4B) as compared to \$15 (4A), 55.8% vs. 35.2%,  $\chi^2(1) = 27.8, p < .001$ .

The average number of questionnaires and questions completed per recruited participant did not differ significantly by condition. But the cost of incentives paid per question completed was substantially greater in condition 4B, \$0.45 vs. \$0.10,  $t(91.9) = -19.6, p < .001$ .

#### Discussion

This experiment differs from the previous three in that it compares two different incentive levels with the same ad, one that promises a financial incentive of unspecified value. In this case, the amount of the incentive constitutes a type of surprise, especially for the condition offering \$60, which is likely higher than most people would expect for a web-based survey study. Because the same ad is used in both conditions, the click rate does not differ between them. But those who were subsequently offered the \$60 incentive

were recruited at a 58% higher rate than those who were offered \$15, allowing a direct estimate of the increase in effectiveness due to the larger incentive among people motivated to click the an ad that mentions an extrinsic incentive.

#### DISCUSSION

These four experiments demonstrate significant and in some cases substantial effects on survey recruitment rates due to different combinations of advertisements and financial incentives. Interestingly, these differences did not extend to measures of ongoing participation; once recruited, participants did not differ significantly in how actively they participated in any of the experiments, even though full payment of the incentives required that participants continue to complete questionnaires. Instead, any differences in the number of responses gathered by condition were due entirely to upstream differences in click and recruitment rates.

#### Incentives, Motivation, and Surprise

##### *Existence Surprises*

Our analysis compares survey participation with different types of incentive surprises. The existence surprise conditions in Experiments 1 and 2 were compared with conditions where the incentive offered matched what was mentioned in the ad, while the participants in the surprise conditions were shown ads that did not mention an extrinsic incentive at all. With the \$15 incentive (Experiment 1), the recruitment rate was lower for people in the surprise condition, suggesting that people who clicked the no-money ad, which played on the desire to contribute to research, were less motivated by the financial incentive than those who clicked an ad that explicitly mentioned the incentive.

The recruitment rate with the no-money ad was 33.9%. By way of comparison, a separate non-experimental recruitment wave outside of the four experiments reported here, using the no-money ad followed by no subsequent offer of a financial incentive, produced a significantly higher recruitment rate of 42.1% out of 627 people who clicked the ad,  $\chi^2(1) = 8.1, p < .01$ . That is, people who clicked the same ad and were subsequently offered \$15 were recruited at a lower rate than those who were offered no financial incentive at all<sup>1</sup>. One interpretation of this result, consistent with crowding theory, is that people intrinsically motivated by the no-money ad were actually demotivated — had their intrinsic motivation crowded out — by the offer of a relatively small financial incentive. Crowding out occurs when intrinsic motivation is undermined in a way that leads to a loss of self-determination or individual control. Financial payments that are contingent on performance negatively affect the desire

<sup>1</sup> Because the separate wave was not part of the main experimental design and involved a different sample, we provide this comparison only as a point of interest and not a primary result.

to complete a given task. In addition, by attaching a monetary value to the task, a financial incentive invites a comparison with the perceived economic value of the task. Thus, a task that might first seem interesting on its own may seem like a bad deal when it is attached to a precise monetary figure. In our experiment, the existence surprise of \$15 may be enough to undermine existing intrinsic motivation, but not large enough to provide an overriding extrinsic motivation to join the study.

By contrast, no such difference was evident in Experiment 2, where clickers of the no-money ad were surprised with a \$60 incentive. In this case, they joined the study at the same rate as those who clicked the ad that offered \$60 from the start. While lower recruitment rates, consistent with crowding out, were evident with the \$15 existence surprise, it appears that the substantially greater value of the \$60 incentive overrode this effect. This does not necessarily mean that intrinsic motivation was *not* crowded out in the \$60 surprise condition. As prior research on crowding effects shows (aptly titled “Pay enough or don’t pay at all”), *small* compensations may lead to lower effort when compared to an equivalent situation with no compensation at all [17]. However, when higher payments are offered for the same task, individuals exert higher effort because the financial incentive is viewed as attractive compensation for the required task, perhaps sufficient to fully compensate for the intrinsic motivation that was crowded out. In our study, \$60 appears to pass the threshold for attractive compensation.

#### *Amount Surprises*

In Experiment 3, we compared outcomes for potential respondents who clicked the \$15 ad were subsequently surprised with a \$60 incentive with outcomes for those who clicked the \$60 ad and were then offered the expected \$60. Even though the amount ultimately offered was the same, those in the amount surprise condition were 31% more likely to join the study. One interpretation of this result is that the same \$60 incentive performed better with the \$15 ad because it was better *relative to participants’ expectations* than it was with the \$60 ad, where it merely met expectations. Because the click rates and subsequent participation levels for the two ads were not significantly different, this was essentially a more efficient way to spend the higher amount in terms of participants recruited and thus responses gathered. Moreover, since all participants clicked an ad that appealed to extrinsic as well as intrinsic motivations from the start, the increased participation when presented with a higher-than-expected incentive is consistent with the notion of crowding in — that is, the existing motivation is amplified by an unexpected incentive consistent with that motivation.

The results of Experiment 4, where \$15 and \$60 incentives were paired with an ad that offered a gift card of unspecified value, are harder to interpret in terms of an amount surprise. One might argue that this scenario is better termed a “delayed reveal” in both conditions, but we believe that \$15 is more

typical of the amount typically offered for participating in an online survey, if a financial incentive is offered at all. By this logic, the \$60 condition would constitute an amount surprise, and indeed we see a similar pattern of results to Experiment 3, with a significantly higher recruitment rate for the \$60 condition as compared to the \$15 condition.

#### **Cost Effectiveness**

An additional contribution of this work is to quantify the relative cost of obtaining responses under different incentive conditions. Across our four experiments, in the \$15 incentive conditions, the estimated incentive cost per 1,000 participants based on participant-level averages was approximately \$13,000, while in the \$60 incentive conditions, it was more than four times as much.

The larger financial incentive improved participation rates substantially, but rates remained low in absolute terms, with no more than 0.97% of the targeted sample successfully recruited in any condition. Moreover, ongoing participation was unchanged even with the \$60 incentive. Thus, the coverage of the sampling frame was poor and no more data was obtained per participant even with the high incentive level, making it hard to argue for the use of such expensive incentives in the present context of recruitment via a web advertisement for the sake of promoting recruitment and ongoing participation. Of course, the desire to compensate participants for their efforts is in many cases a compelling reason to offer incentives anyway.

#### **Limitations**

We have presented four experiments of different advertisement and incentive combinations in recruiting for a longitudinal survey study of online dating behavior. Because the present set of experiments was embedded in the observational dating study, some decisions made in service of the larger study may complicate the interpretation of the experimental results. In this section, we discuss potential limitations to our claims that may result for the present work.

#### *Purely Extrinsic vs. Mixed Incentives*

In Experiments 1 and 2, the ads we designed do not allow us to directly compare appeals to intrinsic motivation with purely extrinsic motivation. Rather, they represent intrinsic-only and *intrinsic-plus-extrinsic* pitches. The no-money ad (#1) was designed to appeal to intrinsic motivation to contribute to scientific research and improve online dating. The other ads, #2 and #3, use an appeal that combines an abbreviated version of this pitch with the mention of a gift card or dollar amount. We believe this combination is the most ecologically valid way to present extrinsic incentives, since a strictly extrinsic pitch with no additional context (“Participate and get \$15”) is both uncommon in recruitment for academic studies and also more likely to be seen as a scam when presented in a web advertisement. Thus, we did not believe this to be a viable approach to recruitment for the dating study. Future work that uses a different recruitment medium may be able to examine the performance of extrinsic-only pitches as well.



### *Payment Parallelism and Response Volume*

We found no difference in ongoing participation in any of our experiments, but one limitation applies specifically to those analyses in Experiment 4, when the actual incentive amount differed: the payment schedules for the \$15 and \$60 conditions were not perfectly parallel. In the \$15 condition, participants received \$5 after completing the first questionnaire and two additional \$5 payments at three weeks and six weeks if they continued completing questionnaires. In the \$60 condition, on the other hand, participants received \$30 after the first questionnaire and two additional payments of \$15 each on the same schedule. Aside from the different total amounts, which constituted the experimental manipulation, the conditions differed in that \$15 participants received a third of the total in each payment, while \$60 participants received half in the first payment and a quarter in each subsequent payment. The primary confound that could result from this difference is that participants in the \$60 condition may be relatively less motivated to continue participating after the first questionnaire because they had already received a greater proportion of their payment, as compared to the \$15 condition or a hypothetical alternative \$60 condition with three equal \$20 payments. Thus, we cannot rule out the possibility that if we had used a balanced \$20-\$20-\$20 payment schedule for the \$60 condition, we might have found a significant difference in ongoing participation as compared to the \$15 condition.

### **CONCLUSION**

We have presented four experiments examining two types of financial incentive surprises in the recruitment of participants for an online survey study. “Existence surprises” performed poorly relative to comparison conditions where the existence of an incentive and its exact amount were not a surprise. We believe this finding may be due to a “crowding out” effect in which intrinsic motivation to participate is dampened, or the intrinsic worth of participation devalued, by the later presentation of an extrinsic incentive. A \$15 surprise incentive yielded recruitment rates that were significantly lower than those produced with an equivalent but expected incentive (Experiment 1), and in fact were also lower than those for a separate sample that was offered no financial incentive at all. Even the \$60 surprise incentive, an unusually large amount for an online study, only achieved parity in terms of participation rate with the same incentive when it was expected (Experiment 2).

“Amount surprises,” where the fact of an incentive was known from the start but the amount was higher than expected, performed better than comparison conditions where the amount ultimately offered was exactly as initially advertised (Experiment 3) or was a typical amount for an online study (Experiment 4). Surprising people recruited via an ad that appeals to extrinsic financial motivation with a higher-than-expected incentive yielded substantially better recruitment rates. However, this advantage did not extend to measures of the volume of subsequent participation on a per-participant basis.

For researchers who wish to recruit participants online, a few recommendations follow from the present work. First, surprising people who are already intrinsically motivated to participate in a study with a financial incentive may be counterproductive. If financial incentives are offered, they work more efficiently when they are part of the recruitment pitch from the start. Second, when people are aware that a financial incentive is offered, a surprisingly high amount can motivate more of them to participate. The same \$60 incentive produced a higher recruitment rate when it was a surprise than when it was disclosed in advance.

Finally, it is important to note that an intrinsic pitch and an extrinsic pitch may attract qualitatively different respondents, whose predisposition to respond may also vary with the context in which the recruitment takes place, in this case an online dating site. Future work should examine how self-selection bias may result from intrinsic vs. extrinsic approaches in additional online contexts.

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