

### **Preliminary remarks**

The following items have changed since 2001:

- Andrea Frick's e-mail address is now [andrea.frick@psy.unibe.ch](mailto:andrea.frick@psy.unibe.ch) (p. 210)
- Reips, in press (p. 212 and References) was published as Reips, U.-D. (2002). Context effects in Web surveys. In B. Batinic, U.-D. Reips, & M. Bosnjak (Eds.), *Online Social Sciences* (pp. 69-80). Seattle: Hogrefe & Huber.
- Footnote 2 (p. 212): the Web Experimental Psychology Lab is now at <http://www.wexlab.eu/> and it has largely been superseded by the web experiment list (<http://wexlist.net>)

Please note that Google Scholar confusingly combines this chapter with an earlier conference proceedings article of the same title that has now been included as a reference with the present chapter. Combined they have received 155 citations, making this contribution a high impact publication in Internet science, Psychology, and the social sciences. It has become an important reference, particularly for research on dropout and on incentives in Internet-based research.

Ulf-Dietrich Reips, Konstanz, October 2013

## Financial Incentives, Personal Information, and Drop Out in Online Studies

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### Introduction

Whereas in a classical laboratory setting participants often feel obliged to stay and finish the experiment, participants in online studies can leave the session at any time.

Although, from an ethical point of view, this is an advantage of online studies, complete voluntary participation might pose methodological problems. Of course, Web experimenters would like their participants to stay until the end of the experiment. To ensure this, they use special techniques.

One such technique is to make Web pages shorter, more attractive, and faster loading as the participant continues further in the study. Such a technique works to increase a participant's interest and enjoyment and may result in fewer drop outs during the most important part of the study. If a Web page has a long loading time at the beginning, participants with minimal interest or little time may leave right away without even starting the experiment. This "high hurdle technique" is particularly effective in combination with a warm-up phase (Reips, 1996, 1999, 2001) to eliminate those who may drop out up front.

A second frequently used technique to prevent participants from leaving is to initially announce a lottery with prizes, in which only those who finish the experiment can take part. Whether or not this procedure is a successful method to reduce the drop out rate in online studies has never been examined experimentally. In a study on material (nonmonetary) incentives in mail surveys, Nederhof (1983) found that incentives did not increase the response rates but did increase the speed of return. Thus, one might argue that promising financial incentives is negligible in reducing drop out or might even reduce the intrinsic motivation of the potential participant (Deci, 1975). A survey among 21 Web experimenters recently conducted by Musch and Reips (2000) suggests that incentives *do* play a role in reducing drop

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out in online studies. They found a clear link between lack of financial incentives and drop out rate. A monetary prize might diminish drop out tendency whenever intrinsically motivating factors are not sufficient. In some studies on mail surveys, a similar effect could be found. For example, James and Bolstein (1992) found response rates of 79.3% when participants received a 20\$ check, whereas in the control condition (no incentives) only 52.0% returned the questionnaire. Similar results might be found if drop out were used as the dependent variable.

The Web experiment at hand has been conducted to further investigate the causal nature of the relationship between financial incentives and drop out under completely voluntary conditions: In online studies. We expected a lower drop out rate when a lottery is announced at the beginning of the experiment.

Another issue that should be considered is the possibility that the use of incentives could bias the participants' answers. The promise of incentives might attract a certain group of participants (Rosenthal & Rosnow, 1975), and it might influence participants' answers. Rush, Phillips, and Panek (1978) found that two samples of volunteer subjects recruited from the same population by different means (paid/unpaid) differed significantly on ability, personality and task-related performance. The participants who had volunteered for their study and received no financial remuneration were more likely to be field dependent and could be characterized by a higher social-interpersonal orientation. Samples of paid volunteers, on the other hand, committed more errors of omission on a dichotic listening task. In analogy to different recruitment methods, presence or absence of incentives might lead to similar differences and different answering behavior.

Most studies contain a few questions potentially revealing the responder's identity. Questions about gender, age, or address reduce the participants' impression of anonymity. In our view, perceived loss of anonymity leads to a higher self-commitment, in the sense of: "I just gave away all this information about myself, therefore this study must be worth finishing." Compliance with all aspects of the study should be better. Consequently, we designed the present Web experiment to test the hypothesis that asking participants for personal information early in the experiment would lead to decreased drop out and a lower non-response rate. So far, a study conducted offline by Giles and Feild (1978) failed to find any effects of the placement of demographic items. In their study, however, they mailed out questionnaires and measured the response rates. Mailed questionnaires can be answered in any order, therefore one

wouldn't expect effects due to the positioning of questions (cf., Schwarz & Hippler, 1995; Reips, in press). The situation is different in WWW questionnaires with only one or very few questions per Web page: Participants cannot look ahead or determine their own response order. Whether demographic data should be assessed at the beginning of an experiment or at the end is an issue of high relevance in online research, as one's choice might create systematic drop out and lower data quality.

Finally, beyond systematic biases introduced by drop out and non-response behaviors, asking for personal information at the beginning of a study could also directly influence answering behavior in questions that are likely to be influenced by social desirability. Participants' answers might be more strongly influenced by social norms if they believed they could be identified (e. g., through their E-mail address). For example, Satow (1975) found a strong (negative) effect of privacy on helping behavior.

## **Method**

### ***Participants***

804 visits from unique IPs were reported on the introductory page of the experiment, 482 in the English version, and 322 in the German version. 682 participants responded to the demographic questionnaire. (Their answers are reported in the results section.)

### ***Procedure***

The experiment was conducted in the Web Experimental Psychology Lab at the University of Zürich<sup>2</sup>. On the lab's Web page, and again on the introductory page of the experiment, the participants had the option to choose between a German version and a comparable English version.

A Common Gateway Interface program (CGI) randomly assigned the participants to one of two versions of the introductory page. One of the two groups received additional information about a lottery to be conducted among those participants who answered all questions (see Figure 1). The first prize that could be won in the lottery was \$40, the second prize was \$25, and the third prize was \$10. The second group did not receive any incentive information.

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<sup>2</sup> <http://www.genpsylab.unizh.ch>

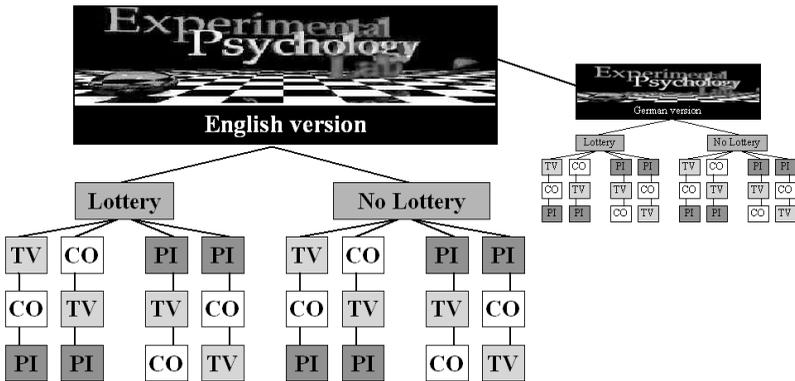


Figure 1. Experimental conditions.

Triggered by a "Submit" button on the introductory page, another randomizing CGI led the participants to one of the four experimental conditions. In each of these four conditions three forms (interactive Web pages) were presented in a different order.

One form assessed personal information (PI) like gender, age, E-mail address or telephone number, and nationality. In two of the four conditions the personal information was assessed at the beginning of the experiment, and in two conditions it was assessed at the end. The remaining two forms (TV and CO) contained two questions that are likely to be influenced by social desirability: "How many hours per week do you watch television?" (TV); "How many hours per week would you work free of charge for a charitable organization?" (CO). The order of these two questions was manipulated.

The independent variables were:

- Information about the lottery: provided or not provided;
- Personal information (PI): assessed at the beginning or at the end;
- Order of presentation of TV and CO;
- The language of the completed version: German or English.

The dependent variables were:

- The answers to the two questions concerning television (TV) and charitable organization (CO), and
- the number of participants leaving the experiment before finishing it completely (drop out rate).

## Results

### Participants

61.4% of the responders of demographic questions ( $n = 686$ ) reported they were female, 33.8% reported they were male, 4.8% did not report their gender. 3.2% of the responders did not report their age. Figure 2 shows the reported age of the remaining 96.8%.

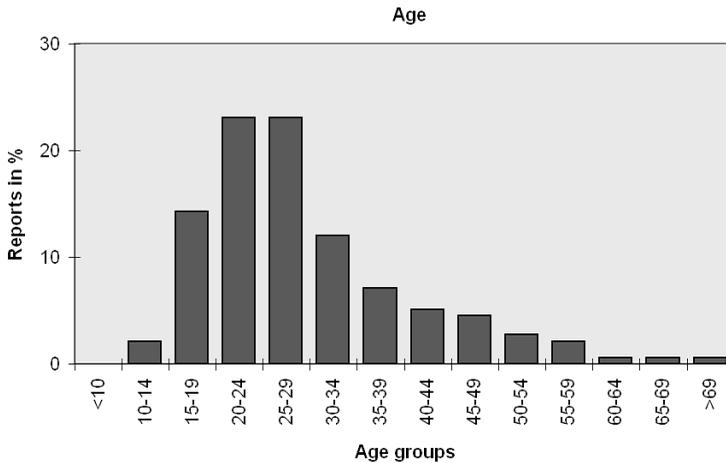


Figure 2. Reported age.

8.9% of the participants who *did* request the page with demographic questions did not report their nationality. The most frequently indicated nationalities (reported by 4 or more participants) were as follows:

**Table 1: Reported Nationality.**

Nation	Reports	Nation	Reports
USA (American)	275	Australia / New Zealand	8
Germany	173	India	7
Switzerland	29	“hispanic”	6
Canada	24	The Netherlands	5
“white”	18	Africa	5
England	13	China	5
Austria	9	Italy	4
Ireland	9	Korea	4
“caucasian”	9	“black”	4

### ***Incentives***

In a drop out analysis, we calculated how many participants left the experiment between the first page after the introductory page (total  $n = 789$ ) and the exit page of the experiment (after the last form) in each condition. Drop out was found to be about twice as large in the non-lottery information condition than in the lottery information condition (18.5% versus 9.5%),  $\chi^2(1, N = 789) = 13.13, p < 0.001$ . This differing drop in number of participants did not occur immediately after the lottery information, as one might have expected if participation were driven by the financial prospect only, but covered the whole length of the experiment.

We conducted a 2 (lottery)  $\times$  2 (PI)  $\times$  2 (order)  $\times$  2 (language) ANOVA with the data. Except for an unexpected three-way interaction between lottery, personal information, and order,  $F(1, 664) = 3.93, p < .05$ , none of the interactions were significant. Incentives did not significantly affect the answers to the two questions concerning television (TV) and charitable organization (CO).

The main effects for factors other than incentives are reported in the sections below.

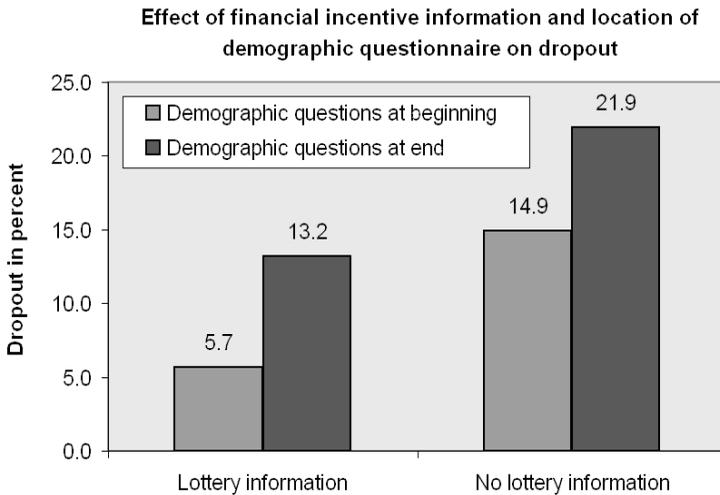


Figure 3. Effect of financial incentive information and location of demographic questionnaire on drop out.

### ***Personal Information***

Asking participants for personal information (PI) early in the experiment led to a decrease in drop out (10.3%, versus 17.5% in the other condition),  $\chi^2(1, N = 789) = 8.40, p < 0.01$ .

A detailed analysis was conducted to see how many questions were left unanswered by those who *did* request the page with questions about demographic data. The results showed that, on average, the group with the demographic questionnaire at the beginning did not answer 4.2% of the demographic questions, whereas the group with the demographic questionnaire at the end left 11.8% of the questions unanswered. For example, when the E-mail address was requested at the beginning, 9.5% (33 out of 349) did not give that information, whereas 20.5% (69 out of 337) did not give their E-mail address when it was requested at the end of the experiment. The corresponding figures for the other demographic questions were: gender: 2.1% (7) to 7.7% (26), age: 0.6% (2) to 5.9% (20), nation: 4.9% (17) to 13.0% (44).

Asking participants for personal information early in the experiment did not lead to different answering behavior in the questions about television consumption (TV) and charitable organization (CO). Therefore,

we are not able to draw a conclusion similar to Satow (1975), who found that higher privacy would reduce helping behavior. Maybe the effect of privacy he found is not applicable to anonymity as we operationalized it (demographic questions, E-mail address, telephone number).

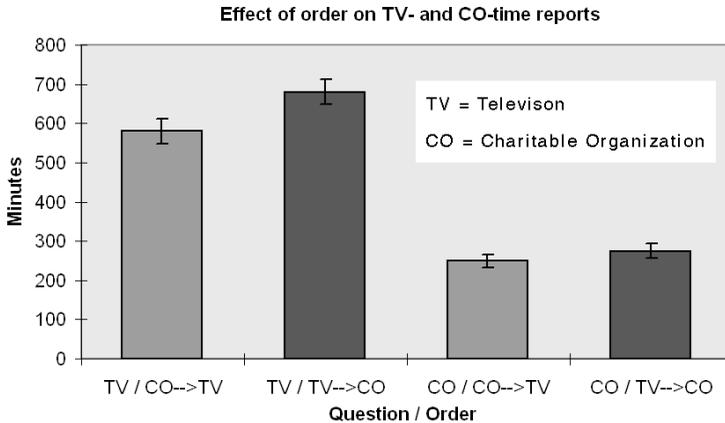


Figure 4. Effect of order on answers to TV- and CO-questions.

### **Order**

Question order (TV/CO vs. CO/TV) had a significant effect on the answers concerning TV,  $F(1, 664) = 5.00, p < .05$  (see Figure 4). Those participants who answered the question about their weekly television consumption first, reported a longer watching time ( $M = 679$  minutes per week,  $SD = 31.2$ ) than those who answered the question about the charitable organization first ( $M = 580$  minutes per week,  $SD = 31.5$ ).

### **Language**

There was also a significant effect of language on the answers about the charitable organization,  $F(1, 664) = 22.78, p < .05$  (see Figure 5). Those participants who completed the German version showed less readiness to work free of charge for a charitable organization ( $M = 203$  minutes per week,  $SD = 15.1$ ) than those who completed the English version ( $M = 321$  minutes per week,  $SD = 19.6$ ).

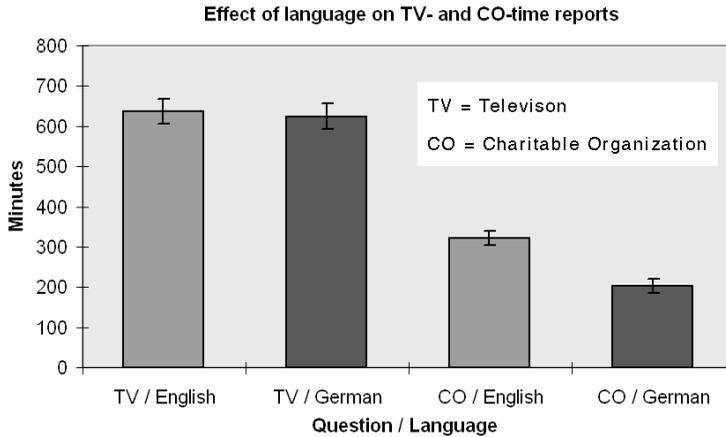


Figure 5. Effect of language on answers to TV- and CO-questions.

## Discussion

### *Incentives*

Data supported the hypothesis that announcing a lottery at the beginning of a study results in a reduced drop out rate. This result is in line with findings from the Musch and Reips (2000) study.

The fact that the varied drop in number of participants was not found immediately after the lottery information but covered the whole length of the experiment suggests that the lottery information does not result in additional motivation to start with the experiment, but diminishes drop out tendency caused by other factors. Factors potentially influencing drop out in online studies are the design of the Web pages, loading time, and general impression of the institution where the study is conducted (Reips, 1999, 2000). These factors should also be studied experimentally.

Although the absence of incentive information did affect the number of participants leaving the experiment before finishing, it did not affect the participants' answers to the questions concerning television and charitable organizations. Consequently, it might not always be necessary to minimize drop out in Web experiments. However, providing financial incentives might be a very promising means to reduce general drop out in online studies.

In our experiment, the amount of money that could be won was quite high, considering the experiment could be completed in a very short time. The relationship between height of incentives in online studies and their effects on the quality of data is an important issue, which should be examined further.

### ***Personal Information***

As our results have shown, the tendency of leaving the experiment when personal information is requested is higher after the experimental questions have already been answered than at the beginning of the experiment. Additionally, the chances are much higher for participants not to provide personal information if it is assessed at the end of the experiment.

One might assume a give-and-take model: Participants are more likely to provide personal information if they are curious to see the experiment. After the experiment, when their curiosity has been satisfied, they are no longer willing to disclose the information. The results suggest that drop out does not increase when personal information is collected early in the experimental process, but rather drop out rates may actually decline. Our findings stand in contrast to the results of the mail survey, Giles and Feild conducted in 1978. They found no relationship between the location of demographic questions and return rates. Yet, the results of mail surveys and Web experiments may not be completely comparable, as in mail surveys the participants are free to fill in the forms in any preferred order.

On the other hand, the early positioning of the demographic questions did not exert any influence on the questions that are likely to be influenced by social desirability. Thus, the questionnaire did not systematically bias data content. This result is quite pleasing because, if demographic data are indispensable for a study, it may be better to put the request at the beginning.

### ***Order***

There are two possible explanations for the order effect in TV and CO answers.

According to a *social desirability hypothesis*, the TV answers that followed CO answers were adjusted to a lower value than the TV first answers as a result of an attempt to create the impression of one's compliance with the social norm which implies that the the lower the

ratio between one's own leisure time and time spent to benefit others, the better. This hypothesis can also explain why the CO answers that followed TV answers were adjusted to a higher value than the CO first answers.

However, the pattern of results can also be explained by an *anchoring heuristic hypothesis*. The well-known anchoring effect suggests that numerical answers to a later item will be adjusted towards an earlier item's value. On the whole, the average TV time is much higher than the average CO time. Given these base rates, it is likely that CO answers will be raised when they follow TV answers, and vice versa.

### **Language**

The significant difference between the German and the English version might imply that, on average, in English speaking societies people show a higher individual devotion to social volunteer work while in German speaking societies the social welfare system is more publicly organized.

Of course, an alternative explanation would be a slight difference in the meaning of German and English terms. 'Charitable organization' in both languages is not a clearly defined term – people might interpret it differently.

### **Conclusions**

This experiment has shown that (1) financial incentives can reduce drop out; (2) assessing participants' personal information at the beginning of an experiment can reduce drop out and may lead to more complete demographic data about the participants; (3) these positive effects can be reached without biasing the data; and (4) the language and order in which items are presented can influence answering behavior.

### **References**

- Deci, E. L. (1975). *Intrinsic Motivation*. New York, NY: Plenum Press.
- Frick, A., Bächtiger, M. T., & Reips, U.-D. (1999). Financial incentives, personal information and drop-out in online studies. In U.-D. Reips, B. Batinic, W. Bandilla, M. Bosnjak, L. Gräf, K. Moser, & A. Werner (Eds.). *Current Internet science - trends, techniques, results. Aktuelle Online-Forschung - Trends, Techniken, Ergebnisse*. Zürich: Online Press.

- Giles, W. F., & Feild, H. S. (1978). Effects of amount, format, and location of demographic information on questionnaire return rate and response bias of sensitive and nonsensitive items. *Personnel Psychology, 31*, 549-559.
- James, J. M., & Bolstein, R. (1992). Large monetary incentives and their effect on mail survey response rates. *Public Opinion Quarterly, 56*, 442-453.
- Musch, J., & Reips, U.-D. (2000). A brief history of Web experimenting. In M. H. Birnbaum (Ed.), *Psychological experiments on the Internet* (pp. 61-85). San Diego, CA: Academic Press.
- Nederhof, A. J. (1983). The effect of material incentives in mail surveys: Two studies. *Public Opinion Quarterly, 47*, 103-111.
- Reips, U.-D. (1996, October). *Experimenting in the World Wide Web*. Paper presented at the 1996 Society for Computers in Psychology conference, Chicago.
- Reips, U.-D. (1999). Theorie und Techniken des Web-Experimentierens [Theory and techniques of Web experimenting]. In B. Batinic, A. Werner, L. Gräf, & W. Bandilla (Eds.), *Online Research: Methoden, Anwendungen und Ergebnisse* (pp. 277-296). Göttingen: Hogrefe.
- Reips, U.-D. (2000). The Web experiment method: Advantages, disadvantages, and solutions. In M. H. Birnbaum (Ed.), *Psychological experiments on the Internet* (pp. 89-114). San Diego, CA: Academic Press.
- Reips, U.-D. (2001). *Methodische Hilfen für das Web-Experimentieren* [Methodological tools for Web experimenting]. Manuscript submitted for publication.
- Reips, U.-D. (in press). Context effects in Web surveys. In B. Batinic, U.-D. Reips, & M. Bosnjak (Eds.), *Online Social Sciences*. Seattle: Hogrefe & Huber.
- Rosenthal, R., & Rosnow, R. L. (1975). *The volunteer subject*. New York: Wiley.
- Rush, M. C., Phillips, J. S., & Panek P. E. (1978). Subject recruitment bias: The paid volunteer subject. *Perceptual and Motor Skills, 47*, 443-449.
- Satow, K. L. (1975). Social approval and helping. *Journal of Experimental Social Psychology, 11*, 501-509.
- Schwarz, N., & Hippler, H. (1995). Subsequent questions may influence answers to preceding questions in mail surveys. *Public Opinion Quarterly, 59*, 93-97.