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The impact of the field time on response, retention, and response completeness in list-based
Web surveys

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Abstract

A short field time is an often-cited benefit of Web-based surveys that rely on pre-recruited people. However, it has never been examined how different field times as implemented through different deadlines for participation influence response behavior. Four experiments were conducted in which the deadline for taking part in the study was varied across several days, and there was a control group who were not told any deadline. We examined the impact of both stating a deadline versus not stating a deadline and the length of the deadline on the response rate, the retention rate, and response completeness.

It was found that response rises with the number of days a study is in the field. There is tentative evidence that the more generous the deadline the smaller the retention rate and clear evidence that response completeness is lower. Moreover, in a quasi-experimental fashion it was explored whether responding late to a study request is associated with being retained until the end of the study and with the completeness of filling out the questionnaire. There is no straightforward association between responding late to a study request on the one hand and retention and response completeness on the other hand.

Keywords: field time, deadline, response, retention, completeness

1. Introduction

It is a hearsay advantage of WWW-studies that one can collect data in a short time (Fricker & Schonlau, 2002). When inviting pre-recruited people to take part in a study, 70% to 90% of expectable responses usually occur within three days (Batinic & Bošnjak, 2000; Göritz, 2007; Gräf, 2001). As a consequence, researchers working with pre-recruited samples gleaned from online access panels or other respondent lists have been tempted to set tight deadlines for study participation to keep the field phase as short as possible. However, setting more or less tight deadlines might have an impact on the quantity and quality of the collected data and on the composition of the final sample. For example, the response rate, the retention rate, and the completeness of participants' responses might prove vulnerable to the number of days a study is in the field. This possible impact of deadlines has never been experimentally studied. We need empirical evidence to prevent us from exclusively considering speed while perhaps compromising response quantity and quality. Based on these data we can derive recommendations as to appropriate field times.

Several studies have examined the effect of field times on response behavior and sample composition in an indirect fashion, namely by looking at particularities among so called *late responders*. The term *late responder* has been used in various shades, either referring to people who respond only after having been sent a reminder (e.g., Bernick & Pratto, 1994; Green, 1991; Guadagnoli & Cunningham, 1989; Stumpf & Bedrosian, 1980; Ullmann & Newcomb, 1998; Woodruff, Conway, & Edwards, 2000; Woodruff, Edwards, & Conway, 1998), to students in college studies who take part in a study late in the term (e.g., Aviv, Zelenski, Rallo, & Larson, 2002; Bernard, 2000; Bernard & Walsh, 2002) or to people who take part only after a certain interval has elapsed (e.g., Biggar & Melbye, 1992; Leopold, 2004; Stieger & Voracek, 2005).

Independent of the exact meaning of the term late responders, as regards sex differences,

women have been found to respond early rather than late (Bernard, 2000; Bernard & Walsh, 2002; Green, 1991; Stumpf & Bedrosian, 1980). Biggar and Melbye (1992) found the opposite, but this might be peculiar to the topic of the study, which was sexual behavior. With regard to age, older participants were more likely to respond early (Green, 1991). By contrast, in Bernard (2000) as well as in Bernard and Walsh (2002) a higher percentage of first-year than senior-year students participated early. However, there are studies that did not find any sex or age differences between early and late responders (Guadagnoli & Cunningham, 1989; Woodruff, et al., 1998; 2000).

Apart from demographic differences, are there indications that early and late responders differ in response behavior? With regard to item-nonresponse, while Green (1991) found no difference, early responders omitted fewer questions in Biggar & Melbye (1992), Donald (1960), and Newman (1962). In Stieger and Voracek (2005), early responders were more likely to be retained until the end of the questionnaire and were more likely to correctly report their sex. These differences in response behavior, at least in part, might derive from differences in Web literacy: Leopold (2004, p. 91f.) found that early responders use the Internet more frequently than late responders. In El-Menouar and Blasius (2005) experienced Internet users were more likely to be retained until the end of a questionnaire than inexperienced Internet users. In a similar vein, Gräf (2001) reported five online panel studies where the final response rate was higher among panelists who at their sign-up had indicated to use the Internet daily (77% mean response rate across the five studies) than among panelists who had indicated to use the Internet on two to five days a week (65% mean response rate).

To sum up previous results, early responders tend to be female, omit fewer questions, and are more likely to be retained until the end of a study. Moreover, those who respond early tend to be more frequent Internet users, and people who use the Internet frequently are more likely to

respond and to be retained until the end of a questionnaire.

However, none of these studies has *experimentally* examined the impact of the field time. Therefore, results pertaining to field time derived from the reported studies need to be taken with caution. To help filling this knowledge gap for online studies, we conducted four experiments. In each experiment, the announced deadline for taking part in the study was varied across several levels, and there was a control group who were not told any deadline. We examined the impact of stating a deadline versus not stating a deadline as well as the impact of the length of the deadline on the response rate (i.e., number of invited people who call up the first page of a study divided by the number of all invitees), the retention rate (i.e., number of responding people who stay until the last page of a study divided by the number of all respondents), and response completeness (i.e., percentage of answered items).

It is difficult to predict whether stating or not stating a deadline influences response, retention, and response completeness. On the one hand, announcing a deadline might convey a sense of the study's importance. As a consequence of the thus increased saliency of the study a higher proportion of invitees might respond to the study request, stay until the end of the study, or participants might skip fewer questions. On the other hand, stating a deadline curtails respondents' freedom of deciding when to participate. Reactance theory (Brehm & Brehm, 1981) states that if a behavioral freedom is threatened, individuals will try to restore their freedom - perhaps by not taking part in the study, abandoning the study prematurely, or omitting items.

As regards the length of the deadline, it can be expected that the more generous the deadline the higher the response rate because the chances of people of learning about the study and of finding the time to respond are larger. Unlike with the response rate, however, with a longer deadline both the retention rate and response completeness are expected to be lower. First, the longer a study is open the bigger the chance that people who use the Internet infrequently

learn about the study from the invitation e-mail before the deadline has elapsed. Thus, the longer a study is open the higher the rate of respondents who use the Internet infrequently in the final sample. However, as infrequent users are less experienced with online questionnaires they are more likely to both drop out of a study and omit questions than experienced users, for reasons of skill.

Second, with longer deadlines not only skill-induced but motivational dropout and item-nonresponse might be larger. If a person assigns high priority to a study he or she is likely to participate soon – whereby field time hardly matters. Conversely, if a person assigns low priority to a study he or she is likely to participate only when nothing more interesting is on their agenda – which is a function of field time. It can be assumed that people for whom a study has low priority participate in a less conscientious manner than people for whom a study has high priority. Consequently, the longer a study is open the more likely that less motivated people access the study, resulting in lower retention and completeness.

The present work tries to find out whether the evidence supports this reasoning. If so, researchers would face a dilemma when setting a tight deadline for participation: On the one hand, the response rate would be lower because fewer people would have the chance to participate. On the other hand, the percentage of retained respondents as well as the percentage of completed items would be higher because the share of Web-literate as well as more motivated people would be higher.

Given the lack of previous experimental findings, our conjectures do not have the status of hypotheses; thus our analyses are exploratory. Inspired by previous findings made in observational studies, besides investigating the aforementioned conjectures we explore the role of sex, age, and the frequency of Internet usage in bringing about possible effects. Moreover, we probe whether late and early responders differ in response behavior. In spite of this exploratory

approach, the risk of committing Type 1 errors is minimized because these relationships are examined in four different experiments. Only those effects that are found repeatedly can be considered robust. Besides a concern for avoiding false positive decisions we conducted four experiments instead of only one or two because we wanted to span studies that are heterogeneous in terms of length of questionnaire, study topic, study sponsor, dose of experimental treatment, and type of participants. Through this, we hope to cast our net widely, yet avoid falling for idiosyncrasies of individual studies.

2. Method

Four experiments were conducted. In each experiment, participants were invited by e-mail. Participants were randomly assigned to be informed about a particular deadline for taking part in the study or – in the control group – not to be told any deadline. In the experimental groups, those few participants who responded past the deadline were considered nonrespondents. In the control group, the study was closed 14 days after the last respondent had taken part. In neither experiment we sent any reminder.

Experiment 1, which was entitled *assessment of media contents*, was conducted in a university-based online panel managed by the first author. This panel holds people from all walks of life who had declared their willingness to participate in research. Their sex, age, and frequency of Internet usage were known from their registration with the panel. The experiment was conducted in March 2005. In the experiment, participants read and assessed a picture-illustrated text and the description of a fictitious product. For the analyses pertaining to response completeness we used 17 non-mandatory closed-ended questions that were asked of everybody. The deadline for participation in the experiment was varied fourfold: 5 days, 12 days, 19 days, and no deadline. A sample of 1,242 panelists was drawn from the panel and invited to this experiment. In the sample, there were 48% women, 79% people used the Internet daily, and the

median age was 25 years.

Experiment 2 was entitled *behavior in professional and private life*. It was conducted in May 2005 in the same online panel that had been used for Experiment 1. Participants rated the similarity of 50 pairs of descriptions of particular behaviors, attitudes, and traits. At the end, they filled out a self-construal questionnaire. For the analyses pertaining to response completeness we used 50 non-mandatory closed-ended questions that were asked of everybody. The deadline for participation in the experiment was varied threefold: 1 week, 2 weeks, and no deadline. A sample of 1,761 panelists was drawn from the panel and invited to this experiment. In the sample, there were 48% women, 77% people used the Internet daily, and the median age was 29 years.

Experiment 3 and 4 were identical with regard to the questionnaire and manipulation of the deadline. The study topic was *image of scientific disciplines*. Participants filled out semantic differentials that expressed opinions about psychology, sociology, business studies, and mathematics. For the analyses pertaining to response completeness we used 67 non-mandatory closed-ended questions that were asked of everybody. Both experiments were carried out in January 2005. The deadline for participation was varied fourfold: 4 days, 7 days, 14 days, and no deadline. Experiment 3 was conducted among students of the University of Vienna (UNET-users). In addition to the students' e-mail address, their sex was known from their enrolment at the university. There were 53% women in the sample ($N = 6,653$). Unlike in the other three experiments, age was only known from the questionnaire (so it could not be analyzed as a predictor for response) and frequency of Internet usage was unknown. Experiment 4 was conducted in the same panel that had been used as a sampling pool for Experiments 1 and 2. In the sample ($N = 1,685$), there were 46% women, 77% people used the Internet daily, and the median age was 30 years.

There were two research questions. First, we were interested in the effect of stating a

deadline versus not stating a deadline. For this analysis, the experimental groups in which a deadline was stated were collapsed and contrasted with the control group in which no deadline was stated. Second, we examined the effect of the length of the stated deadline (i.e. the number of days the study was in the field). For this analysis, only the experimental groups in which a deadline was stated were taken into account.

The statistical analyses proceeded as follows: In each of the four experiments, there were three dependent variables (1) *response* with values *responded* and *refused*, (2) *retention* with values *retained* and *dropped out*, and (3) *response completeness* which is the percentage of answered closed-ended questions. When we speak of dropout we mean the complement of retention, that is, the dropout rate is 100 minus the retention rate. When analyzing response completeness, to avoid confounds, only non-dropouts were taken into account.

For each of the two research questions, two logistic and one linear regression analyses were calculated. Dependent variables were *response*, *retention* and *percentage of answered questions*, respectively. The predictor with the first research question was *stating of a deadline* (dichotomous) and with the second research question *stated deadline in days* (metric). Control variables were participants' *sex* (dichotomous), the median-split *age* (dichotomous), *Internet usage* with values *daily* or *not daily* (dichotomous) as well as the interaction terms *deadline X age*, *deadline X sex* and *deadline X Internet usage*. In Experiment 3, we lacked the *Internet usage* information, and we had age information only for respondents. The initial models were reduced in a stepwise manner by removing nonsignificant interactions and the control variables' main effects.

To explore whether responding late is associated with retention, for each experiment two logistic regressions were calculated - one with *deadline/no deadline* and one with *deadline in days* as well as *response delay* and the *deadline X response delay* interaction as predictors. We

proceeded likewise when exploring whether early and late responders differ in response completeness.

3. Results

The response rate, the retention rate, and the percentage of answered items in the four experiments broken down by deadline are listed in Table 1.

---- Insert Table 1 about here ----

3.1 Deadline(s) on Response.

The final models are given in Table 2. On the question whether setting a deadline influences response, in Experiment 1 there was a significant interaction between stating a deadline and age: Elder invitees who were not given a deadline were 2.3 times more likely to respond to the study request than elder invitees who were told a deadline. In Experiment 3, there was a main effect of stating a deadline, in that the response rate was higher if no deadline was stated. In Experiments 2 and 4, response did not vary systematically as a function of setting a deadline. On the question whether the deadline's length influenced the response rate, in all four experiments the longer the field time the higher the percentage of invitees who responded. In Experiment 3 this effect reached a conventional level of significance. As can be gleaned from the odds ratio, this effect is small: With each day longer a study is open the ratio of responders to refusers rises by 2%.

---- Insert Table 2 about here ----

3.2 Deadline(s) on Retention.

On the question whether setting a deadline influences retention, in neither of the

experiments there is a significant effect nor is there any pattern discernible when eyeballing Table 3. As regards the impact of the deadline's length, in three of the four experiments the longer the study was in the field the lower the retention rate. In Experiment 3, this effect reached a conventional level of significance: With each day of added field time the ratio of retainees to dropouts fell by 5%.

---- Insert Table 3 about here ----

3.3 Deadline(s) on Response Completeness.

As for whether setting a deadline influences response completeness (see Table 4), there was no significant effect nor any consistent pattern at the descriptive level. As regards the impact of the length of deadline, there is a pattern across all four experiments that response completeness is lower the longer a study was in the field. However, this effect was significant only in Experiment 3. The range of this effect's size across the four experiments was 0.02 to 0.15 percentage points fewer completed questions each day longer the study was in the field.

---- Insert Table 4 about here ----

3.4 Response Delay and Retention.

Across the four experiments, there was no consistent pattern of association between response delay and retention (see Table 5). Despite the many tests performed, there was only one significant interaction: In Experiment 1, the later people who were given a generous deadline responded or the earlier people who were given a tight deadline responded the more likely they were to be retained.

---- Insert Table 5 about here ----

3.5 Response Delay and Response Completeness.

In none of the four experiments there was any association between response delay and response completeness (Table 6).

---- Insert Table 6 about here ----

4. Discussion

Overall, the response rate does not differ if a deadline is set or not. In Experiment 3, the response rate was significantly higher if no deadline was stated. Because this effect was not corroborated in the other three experiments it is not robust. Moreover, because of the large statistical power in Experiment 3, even a tiny deflection becomes significant.

While it is generally difficult to interpret null effects, we think that a deadline's null effect on response might result from no mechanisms set in motion whatsoever or it might be due to opposing mechanisms that offset each other. On the one hand, failing to announce a deadline might leave invitees disoriented as to whether a study is still open. Because it is frustrating to try to take part in a study in vain, when in doubt about whether data collection is still ongoing, some invitees will prefer not to attempt to take part in such a study. Hence, this mechanism would diminish the response rate if no deadline is given. To the same effect, indicating a deadline might accentuate a study's importance. As a consequence of the thus increased saliency of the study more people might respond when a deadline is set. On the other hand, leaving a study open until nobody takes part any more entails an objectively longer field time, with the consequence that people have a higher chance of taking part. Hence, this mechanism would increase the response rate if no deadline is implemented.

In Experiment 1, an interaction with age was found, in that elder people were less likely to

respond if there was a deadline. More mature people are – on average – more financially and socially established. It is plausible that established respondents resent being limited in their freedom (i.e., by a deadline) more than others. However, because this effect was found in only one experiment out of three possible ones and the interpretation is post hoc it should be met with caution.

There was a consistent pattern that the longer a deadline the higher the response rate. This can be explained in that the more days a study is in the field, the higher the chance of potential respondents of taking part in this study.

While a deadline per se does not influence retention, there is tentative evidence that once a deadline is set its length does influence retention: In three experiments, the longer the study was open the lower the retention rate. In studies with a longer field time the percentage of respondents who are less motivated might be higher because the longer a study is open the higher the chance that less motivated persons find nothing better to do than to participate. Those people are more likely to drop out of the study than highly motivated ones. Contrary to a conjecture voiced in the Introduction, the higher dropout with longer deadlines does not seem to be skill-induced. Originally we reasoned that a longer deadline allows also infrequent Internet users to respond, and thus a larger share of respondents does not finish the study on account of their lower degree of technological proficiency. In the three experiments where we tested this conjecture, there was no interaction or main effect of the frequency of Internet usage on retention, with Internet usage being a proxy for technological proficiency. However, this finding needs to be taken with caution: In these three samples the frequency of Internet usage was high as 77 to 79% of invitees used the Internet daily. Because of this ceiling effect one can better address the question of skill-induced dropout in research with a more heterogeneous sample in terms of Internet experience.

In the same vein, there was no indication that response completeness systematically varies

as a function of setting a deadline per se. However, there was a consistent pattern that response completeness is somewhat lower the more generous a deadline. We think that the same motivational explanation applies that we put forward when discussing reduced retention. On response completeness as well, there was no interaction or main effect of the frequency of Internet usage; hence the conjecture about the role of a lack of experience does not seem to hold.

In a quasi-experimental fashion we explored whether responding late is associated with retention and with the completeness of filling out the questionnaire. In Experiment 1, the sooner people responded if they had been given a tight deadline the more likely they were to be retained. However, as this observation was made in only one experiment out of four, it might be spurious. Furthermore, in none of the four experiments, there was any association between response delay and response completeness. This is line with Green (1991) who found no difference in the number of omitted items between early and late responders, and in opposition to Biggar and Melbye (1992), Donald (1960), and Newman (1962) who found early responders to omit fewer questions.

Throughout the four experiments the variance accounted for by the models was small. One reason might be that even with each experiment's shortest deadline (i.e., four, five, and seven days) the bulk of the responses had already taken place before the deadline came into effect, thus leaving little scope for possible effects. Drastically shorter deadlines (e.g., one or two days) might remedy this ceiling effect. However, deadlines of such brevity are problematic because (1) invitees are often used to longer deadlines, and (2) confounding influences such as the time of day or the weekday a study invitation is sent out would gain more weight in accounting for the effects observed.

The random assignment of participants to experimental conditions is an asset of the present work, which renders alternative explanations for the effects unlikely. We also believe that the

study of large and heterogeneous samples is a unique contribution of the present research. Our findings as gained from four experiments are more robust than if they had been observed in only one experiment. Because the four experiments varied in several ways such as the length of questionnaire, study topic, doses of experimental treatment, sample type (i.e., both students and online panelists), it can be assumed that the findings generalize to similar studies.

This research is limited in that variables other than the ones taken into account in the four experiments might be relevant in the interplay between field time and response behavior such as personality or time management variables. More studies are needed to draw a more comprehensive picture and to derive detailed recommendations for intervention. Moreover, the research at hand was conducted with pre-recruited respondents; hence our results do only pertain to Web-based studies that rely on a list of e-mail addresses of potential respondents. While such list-based surveys are probably the most common type of WWW-based surveys, researchers might still be interested in employing deadlines in other types of Web surveys. For example, researchers might try deadlines in open surveys with ad hoc recruitment of participants or in mixed-mode surveys that make use of the Web only in part.

In sum, our results allow making preliminary recommendations on working with deadlines in list-based Web surveys. The response rate can be somewhat increased through setting a generous deadline. However, increasing the response rate that way comes at a price: Response completeness is lower the more generous the deadline, and there are tentative indications that retention is lower, too. It remains to the individual researcher to weigh these different desiderata against each other in view of the goals and constraints of a given study.

References

- Aviv, A.L., Zelenski, J.M., Rallo, L., Larsen, R.J., 2002. Who comes when: Personality differences in early and later participation in a university subject pool. *Pers. Individ. Differ.* 33, 487–496.
- Batinic, B., Bošnjak, M., 2000. Fragebogenuntersuchungen im Internet [Online-Studies on the Internet], in: Batinic, B. (Ed.), *Internet für Psychologen*. Hogrefe, Göttingen, pp. 287–317.
- Bernard, L.C., 2000. Variations in a subject pool as a function of earlier or later participation. *Psychol. Rep.* 86, 659–668.
- Bernard, L.C., Walsh, R.P., 2002. Variations in a university subject pool as a function of earlier or later participation and self-report: A replication and extension. *Psychol. Rep.* 91, 553–570.
- Bernick, E.L., Pratto, D.J., 1994. Improving the quality of information in mail surveys: Use of special mailings. *Soc. Sci. Quart.* 75, 212–219.
- Biggar, R.J., Melbye, M., 1992. Responses to anonymous questionnaires concerning sexual behavior: A method to examine potential biases. *Am. J. Public Health.* 82, 1506–1512.
- Brehm, S.S., Brehm, J.W., 1981. *Psychological reactance: A theory of freedom and control*, Academic Press, New York.
- Donald, M.N., 1960. Implications of nonresponse for the interpretation of mail questionnaire data. *Public Opin. Quart.* 24, 99–114.
- El-Menouar, Y., Blasius, J., 2005. Abbrüche bei Online-Befragungen: Ergebnisse einer Befragung von Medizinerinnen [Drop-out in online studies: Results of a survey on health professionals]. *ZA-Information.* 56, 70–92.
- Fricker Jr., R.D., Schonlau, M., 2002. Advantages and disadvantages of Internet research surveys: Evidence from the literature. *Field Methods.* 14, 347–367.
- Göriz, A.S., 2007. Using online panels in psychological research, in: Joinson, A.N., McKenna,

- K.Y.A., Postmes, T., Reips, U.-D. (Eds.), *The Oxford Handbook of Internet Psychology*. Oxford University Press, Oxford, UK, pp. 473–485.
- Gräf, L., 2001. Internet Access Panels in der Praxis [Internet access panels in practice], in: Theobald, A., Dreyer, M., Straszetzki, T. (Eds.), *Online-Marktforschung*. Gabler, Wiesbaden, pp. 255–270.
- Green, K.E., 1991. Reluctant respondents: Differences between early, late, and nonresponders to a mail survey. *J. Exp. Educ.* 59, 268–276.
- Guadagnoli, E., Cunningham, S., 1989. The effects of nonresponse and late response on a survey of physician attitudes. *Eval. Health Prof.* 12, 318–328.
- Leopold, H., 2004. Rücklauf bei Online Befragungen im Online Access Panel [Response in online surveys in online access panels], Kovac, Hamburg.
- Newman, S.W., 1962. Differences between early and late respondents to a mailed survey. *J. Advertising Res.* 2, 37–39.
- Stieger, S., Voracek, M., 2005. Hände weg von spät eingetroffenen Online-Fragebögen: Eine Analyse von Late-Respondern in einer Closed-Pool-Online-Studie [Hands off questionnaires that were submitted late: An analysis of late-responder in a closed pool online study]. Paper presented at General Online Research Conference in Zurich.
- Stumpf, S., Bedrosian, H., 1980. Response characteristics in a mail survey. *Psychol. Rep.* 46, 863–869.
- Ullman, J.B., Newcomb, M.D., 1998. Eager, reluctant, and nonresponders to a mailed longitudinal survey: Attitudinal and substance use characteristics differentiate respondents. *J. Appl. Soc. Psychol.* 28, 357–375.
- Woodruff, S.I., Conway, T.L., Edwards, C.C., 2000. Increasing response rates to a smoking survey for U.S. Navy enlisted women. *Eval. Health Prof.* 23, 172–181.

Woodruff, S.I., Edwards, C.C., Conway, T.L., 1998. Enhancing response rates to a smoking survey for enlisted U.S. Navy women. *Evaluation Rev.* 22, 780–791.

Table 1: Response, retention, and response completeness in Experiments 1 to 4 by deadline.

	Deadline [d]	Response	Retention	Answered Questions
Exp 1	5	107 (36.6%)	94 (87.9%)	99.1%
	12	122 (39.2%)	98 (80.3%)	98.2%
	19	126 (41.4%)	104 (82.5%)	97.9%
	none	133 (42.8%)	116 (87.2%)	97.5%
Exp 2	7	265 (46.1%)	209 (78.9%)	99.8%
	14	297 (50.5%)	241 (81.1%)	99.4%
	none	270 (45.5%)	223 (82.6%)	99.4%
Exp 3	4	158 (19.4%)	127 (80.4%)	99.2%
	7	164 (20.0%)	132 (80.5%)	98.9%
	11	177 (21.5%)	132 (74.6%)	99.0%
	14	187 (22.7%)	135 (72.2%)	97.4%
	none	757 (22.8%)	578 (76.4%)	98.7%
Exp 4	4	107 (51.9%)	98 (91.6%)	99.4%
	7	95 (45.5%)	79 (83.2%)	99.2%
	11	115 (54.0%)	100 (87.0%)	99.1%
	14	105 (50.7%)	88 (83.8%)	99.2%
	none	447 (53.0%)	387 (86.6%)	99.2%

Table 2: Final model for predicting response from independent variables.

	Variable	<i>Wald</i>	<i>p</i>	Odds Ratio
Exp 1	age	7.92	.005	0.37
	deadline X age	9.22	.002	2.26
	deadline vs. no deadline	5.83	.016	0.36
	deadline in days	3.00	.08	1.02
Exp 2	deadline vs. no deadline	1.05	.30	0.90
	deadline in days	2.72	.10	1.03
Exp 3	deadline vs. no deadline	4.49	.03	1.13
	deadline in days	3.71	.05	1.02
Exp 4	deadline vs. no deadline	1.42	.23	1.12
	deadline in days	0.22	.64	1.01

Table 3: Final model for predicting retention from independent variables.

	Variable	<i>Wald</i>	<i>p</i>	Odds Ratio
Exp 1	deadline vs. no deadline	1.08	.30	1.36
	deadline in days	1.06	.30	0.97
Exp 2	deadline vs. no deadline	0.75	.39	1.18
	deadline in days	0.45	.50	1.02
Exp 3	deadline vs. no deadline	0.02	.89	0.98
	deadline in days	4.64	.03	0.95
Exp 4	deadline vs. no deadline	0.01	.97	1.01
	deadline in days	1.60	.21	0.95

Table 4: Final model for predicting item response from independent variables.

	Variable	<i>T</i>	<i>p</i>	<i>B</i>
Exp 1	deadline vs. no deadline	-0.98	.33	-0.93
	deadline in days	-1.13	.26	-0.09
Exp 2	deadline vs. no deadline	-0.63	.53	-0.25
	deadline in days	-1.08	.28	-0.06
Exp 3	deadline vs. no deadline	0.28	.78	0.11
	deadline in days	-1.97	.05	-0.15
Exp 4	deadline vs. no deadline	0.02	.98	0.01
	deadline in days	-0.61	.54	-0.02

Table 5: Relationship between response delay and retention.

	Variable	<i>Wald</i>	<i>p</i>	Odds Ratio
Exp 1	deadline vs. no deadline	1.45	.23	1.49
	response delay in days	0.01	.94	0.99
	deadline X response delay	0.04	.85	0.99
Exp 1	deadline in days	3.36	.07	0.95
	response delay in days	5.09	.02	0.54
	deadline X response delay	4.71	.03	1.04
Exp 2	deadline vs. no deadline	0.70	.40	1.19
	response delay in days	0.13	.71	1.04
	deadline X response delay	0.02	.88	0.99
Exp 2	deadline in days	0.97	.32	1.03
	response delay in days	1.05	.30	1.33
	deadline X response delay	0.91	.34	0.98
Exp 3	deadline vs. no deadline	0.54	.46	1.11
	response delay in days	0.74	.39	1.09
	deadline X response delay	1.16	.28	0.95
Exp 3	deadline in days	7.14	.01	0.92
	response delay in days	1.14	.28	0.83
	deadline X response delay	1.83	.18	1.02
Exp 4	deadline vs. no deadline	0.29	.59	1.13
	response delay in days	2.48	.12	1.40
	deadline X response delay	1.35	.25	0.87
Exp 4	deadline in days	2.93	.09	0.92

response delay in days	0.03	.87	0.94
deadline X response delay	0.63	.43	1.03

Table 6: Relationship between response delay and item response.

	Variable	<i>T</i>	<i>p</i>	<i>B</i>
Exp 1	deadline vs. no deadline	-0.85	.40	-0.87
	response delay in days	0.51	.61	0.24
	deadline X response delay	-0.40	.69	-0.10
Exp 1	deadline in days	-1.16	.25	-0.10
	response delay in days	0.34	.73	0.33
	deadline X response delay	-0.14	.89	-0.01
Exp 2	deadline vs. no deadline	-0.39	.70	-0.17
	response delay in days	0.29	.78	0.06
	deadline X response delay	-0.45	.65	-0.06
Exp 2	deadline in days	-0.98	.33	-0.06
	response delay in days	-0.01	.99	-0.01
	deadline X response delay	0.04	.97	0.00
Exp 3	deadline vs. no deadline	-0.26	.79	-0.12
	response delay in days	-0.68	.50	-0.20
	deadline X response delay	0.81	.42	0.12
Exp 3	deadline in days	-1.79	.07	-0.17
	response delay in days	-0.42	.67	-0.23
	deadline X response delay	0.39	.69	0.02
Exp 4	deadline vs. no deadline	0.27	.79	0.04
	response delay in days	0.60	.55	0.06
	deadline X response delay	-0.53	.59	-0.03
Exp 4	deadline in days	-0.24	.81	-0.01

response delay in days	0.86	.39	0.15
deadline X response delay	-0.68	.49	-0.01
