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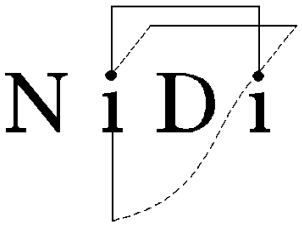

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Coping with survey fatigue: the impact of late reminders on web survey response

With the growing possibilities for conducting online surveys, researchers increasingly use such surveys to recruit student samples for research purposes in a wide array of social science disciplines. Simultaneously, higher education students are recurrently asked to complete course and teacher evaluations online and to participate in small-scale research projects of fellow students, leading to survey fatigue among student populations across the globe. One of the most frequently reported effects of over-surveying is a decrease in overall response rates. This situation has significant impacts on the generalizability and external validity of findings based on online surveys. The collection of reliable data is, nevertheless, crucial for researchers as well as educational practitioners and administrators, and strategies should be developed for achieving acceptable response rates. This paper reports on a methodological experiment (n = 15,651) conducted at the University of Antwerp, Belgium, in which possible strategies to improve student survey response are explored. I specifically focus on the impact of a late reminder as well as specific reminder contents on response rates. Furthermore, I investigate whether early respondents and initial refusers have different profiles.

Keywords: *Web surveys; higher education; response rate; survey fatigue; students*.

Introduction

Today, scholarly researchers and educational practitioners increasingly use online surveys and formats for scientific research and for assessing a wide range of university-related issues, such as students' satisfaction with courses and teachers. The advantages of web surveys have been extensively documented in the academic literature. They tend to reduce the cost of questionnaire distribution and administration and eliminate the influence of an interviewer (Couper 2000, Tourangeau, Couper and Conrad 2004), while respondents are able to control how and when they complete the survey (Christian, Parsons and Dillman 2009) and no educational time is lost by the completion of questionnaires or evaluations during lectures. In addition, web surveys offer the advantages of obtaining large samples in a relatively easy way (Couper 2000, Malhotra 2008) as well as increased response accuracy because respondents enter their own information directly (Durrant and Dorius 2007). However, there are also several pitfalls. The key challenges addressed in the scholarly literature are errors of non-observation or

issues of representation (Couper and Miller 2008) and data quality (Malhotra 2008, Sánchez-Fernández et al. 2010). Errors of non-observation generally comprise coverage and nonresponse (Couper et al. 2007, Vehovar and Lozar Manfreda 2008). Nevertheless, as several scholars indicate (Couper 2000, Couper et al. 2007, Smyth and Pearson 2011), for a specialized population such as students in higher education, web surveys might be the ideal instrument with few coverage and sampling problems, which makes an online administered questionnaire an ideal tool to survey this group.

Although web surveys are considered an ideal instrument for students' assessments and evaluations, response rates have been steadily decreasing over the last decades (Adams and Umbach 2012, Avery et al. 2006, Nair and Adams 2009). Part of students' nonresponse can be explained by the fact that students do not always use or consult their official university email address, may have dropped out, experience technical issues, or the invitation email can be considered SPAM. Nevertheless, there is another significant factor leading to decreasing response rates: students in higher education are among the most surveyed population groups in society (Sax, Gilmartin and Bryant 2003), which enhances a feeling of survey fatigue and a lack of engagement in the survey process. As a result, there is a need to develop strategies for addressing such student survey fatigue. The aim of this article is twofold. First, I report an experiment I conducted to investigate possible strategies to motivate initial non-responders to still participate in the survey. Furthermore, I compare the profile of 'initial refusers' with those of early responders. Second, I aim to stimulate the debate on response rates and motivate other researchers to add experiments to their online surveys, in order to further develop reliable strategies for addressing student survey fatigue and ensure acceptable response rates.

Background

Survey non-response

Today, even a response rate below ten per cent is not uncommon for web surveys (Conrad et al. 2010, Fricker 2008, Heerwegh et al. 2004, Muñoz-Leiva et al. 2010, Porter 2004, Smyth and Pearson 2011). Several meta-analyses reveal, for example, that web surveys generally get a 6 to 15 per cent lower response rate compared to other survey modes (Fan and Yan 2010, Smyth and Pearson 2011, Vehovar and Lozar Manfreda 2008), and nowadays many studies conducted among students show response

rates well below 20 per cent. Although it has been suggested that student surveys with a 10 per cent or lower response rate can eventually be considered trustworthy if the researcher checks the response quality (Nair, Adams and Mertova 2008), researchers and practitioners should be aware of the pitfalls of (very) low response rates, especially considering the fact that online administered surveys increasingly inform the planning of undergraduate and postgraduate education (Porter 2004).

In the academic literature, it has been repeatedly suggested that non-response is not random and differences between respondents and non-respondents can seriously bias results (Groves 1989, Heerwegh, Abts and Loosveldt 2007). Decreasing response rates increases the likelihood of a difference in opinion and attitude between non-respondents and respondents (Adams and Umbach 2012, Groves and Peytcheva 2008). Bias resulting from low response rates can, in its turn, affect the usefulness of the collected data, as well as the reliability and external validity of a study (Adams and Umbach 2012, Spitzmüller et al. 2006, Webber, Lynch and Oluku 2013). This is not to say that non-response always significantly undermines findings (Avery et al. 2006, Groves 2006, Groves et al. 2006, Sax, Gilmartin and Bryant 2003). When only a low correlation of the causes of non-participation with survey variables such as the topic or needed time to complete the survey exists, results appear to still have their validity (Groves and Peytcheva 2008). However, there is only little research available on how to cope with low response rates of surveys in higher education institutions (Adams and Umbach 2012). In sum, with decreasing response rates on the one hand, but wide-spread use of online survey guiding academic management decisions and informing (social science) scientific research on the other hand, it is important to develop practical strategies for ensuring acceptable response rates.

Student survey fatigue

In recent years, students are literally 'bombarded' with invitations to complete online surveys and evaluations. Such invitations are not merely limited to the area of higher education; students also regularly encounter them in their daily lives in the form of, for example, rating online services, entering online prize polls or invitations to evaluate websites. At institutions for higher education, moreover, students are regularly asked to complete online surveys and evaluations. At the University of Antwerp, for example, between March and May 2012, students from the Faculty of Social and Political

Sciences received 57 invitations from fellow students to participate in surveys in the framework of their bachelor or master theses, two web survey invitations from researchers from the university for scientific purposes, and five invitations to evaluate attended courses. This adds up to a total of 63 invitations over a 92-day period, an average of one invitation every day and a half, logically enhancing student survey fatigue and low response rates.

In the higher education literature, it has been shown that respondents are generally characterized by high performance and achievement (Adams and Umbach 2012, Avery et al. 2006, Porter and Whitcomb 2005, Porter and Umbach 2006). Research among college students also revealed that response rates differ according to personality (Porter and Whitcomb 2005, Sax, Gilmartin and Bryant 2003), gender (Avery et al. 2006, Porter and Whitcomb 2005, Sax, Gilmartin and Bryant 2003) and ethnicity (Avery et al. 2006, Porter and Umbach 2006), with female students and ethnic majority students being more likely to respond. Research has, moreover, consistently shown that the response rate is closely related to the topic (Groves, Presser and Dipko 2004, Porter, Whitcomb and Weitzer 2004) and how long it takes to complete the survey (Fan and Yan 2010). The longer the stated length, for example, the fewer respondents engage in the survey (Galesic and Bosnjak 2009). Thirteen minutes or less seems to be the ideal length for obtaining a high response rate (Fan and Yan 2010:133). Nevertheless, such short questionnaires are not always possible for the topics investigated, especially where scientific surveys are concerned. Thus, in cases where surveys are relatively long, a lower response rate is generally the result.

Although students' response might differ because of different attitudes, opinions or practical barriers to participation, not all students can be classified clearly as 'responders' and 'non-responders' (Webber, Lynch and Oluku 2013). Spitzmuller et al. (2006), for example, analysed a student sample and differentiated between passive and active non-respondents, the former explicitly stating they were not willing to complete an organizational survey. They discovered that only 14 per cent formed part of the active non-respondent group. The passive non-respondents and respondents, moreover, appeared not to differ in their perceptions of relevant organizational processes.

The presented methodological experiment is grafted on the literature showing that response rates increase alongside the number of reminders (e.g. Fan and Yan 2010, Sheehan 2001), with, however, a maximum of three or four messages (Muñoz-Leiva et

al. 2010). I departed from the idea that the specific content of a reminder might have an influence on response rates as well. As such, I considered the influence of subtle, indirect and non-conscious processes of social influence on 'conformity', referring to 'the act of changing one's behavior to match the responses of others' (Cialdini and Goldstein 2004:606). After all, those students who did not complete the survey had to be convinced to reconsider potential participation. My first starting point was the idea that providing exact information on the number of students that already answered the survey would produce 'social pressure' and increase the response rate. Nevertheless, the opposite direction can also be true. When mentioning the exact numbers of participating students, respondents might also perceive that there are already enough respondents, and their participation is not required. This would be in line with the scientific literature suggesting that perceptions of scarcity can increase response rates, as this makes respondents feel special. Examples of scarcity perceptions are mentioning the deadline of the survey as well as stating that the respondents form part of a small select group (Porter and Whitcomb 2003a).

My second starting point was the idea that response rates would also increase when providing students with exact information on the time-schedule, enabling them to assess more adequately when to complete the survey. This idea builds further on research carried out by Peytchev (2009), which showed the importance of providing respondents with an adequate estimation of the time they will need to complete the survey. In practice, this often leads to time-ranges such as 'between 15 and 25 minutes'. In order to provide the respondents with the most accurate information as possible, I decided to send them the median time other students needed to complete the questionnaire. This means that I referred to real-time indicators of other students, which might stimulate their participation.

In sum, in this paper I investigate possible strategies for motivating initial refusers to still participate in the survey.

Materials and Methods

Data

In this paper, I report an experimental test conducted with an online survey administered to 15,651 higher education students at the University of Antwerp, Belgium between October and December 2013. The survey was available in two languages

(Dutch and English). The main aim of the questionnaire was to explore students' attitudes and opinions about internationalization initiatives at the university in order to offer adequate 'internationalization at home' activities and initiatives in their curriculum. This specific might have an influence on the response rate: those who tend to participate in such activities can be expected to be more likely to answer the questionnaire. To control for this possible source of bias, I include topic interest as a control variable in the analysis. Nevertheless, it should be noted that we were particularly interested in the opinions of those who are not eager to participate in such activities, in order to develop specific internationalization activities for these students, tailoring them to their needs as well. As a result, the topic was expected to be of interest to all students. Standard ethical procedures were followed, and students were able to withdraw their participation at any point during the survey process.

The survey was tested with the most popular internet browsers (Internet Explorer, Mozilla Firefox, Opera, Google Chrome and Safari) to ensure that all respondents received the survey in a similar and useable format. Students received two reminders in the subsequent week, as this also shows improvement in the response rate (Fan and Yan 2010). Whereas this timing might seem relatively quick, the academic literature suggests that sending reminders two days instead of five days after the invitation is more effective for increasing response rates (Crawford, Couper and Lamias 2001). Students who already completed the questionnaire did not receive these reminders. All students received an individual link to the questionnaire. This means that they accessed the questionnaire directly, without having to provide a username and password, as this has a positive effect on the response rate (Porter 2004). The individual links also ensured that the questionnaire could not be completed several times. No incentives were offered to the students, since the literature suggests that (especially postpaid) incentives in web surveys might result in lower data quality whereas the response rate does not increase significantly, particularly in comparison with offline surveys (Göritz 2006, Göritz and Luthe 2013, Groves, Presser and Dipko 2004, Porter 2004, Porter and Whitcomb 2003b, Sánchez-Fernández et al. 2010, Su, Shao and Fang 2008). The response rate after these two reminders was 24.96 per cent.

Method

I sent a final reminder to those students who did not respond, or only partially completed the questionnaire between 9 and 28 days after the second reminder. I divided the sample randomly into four groups. Each group received a reminder with a different content. The first group (n = 2,946) received the standard reminder email which they also received during the normal survey process. The second group (n = 2,927) received the standard reminder email with exact information on the average time other students needed to complete the questionnaire. The third group (n = 2,940) received the standard reminder with exact information on the number of students that had already completed the questionnaire. The last group (n = 2,913) received the standard information with the exact average completion time as well as number of students that had already completed the questionnaire. As all groups were randomly selected, the bias related to specific disciplines and students lecture schedules is minimized.

Analysis

For my analysis of the evolution of response rates, descriptive statistics are used. In order to investigate differences between initial refusers (those who answered to the extra reminder) and those who completed the survey during the standard survey process, 'time of response analysis' (Porter and Whitcomb 2005) was applied. Statistical significance is estimated by Chi-squared tests, and a Bonferroni correction is applied for controlling the Type I error rate.

Variables included in the analysis

I included several demographic variables in the analysis for comparing different response waves, as well as a measure of topic salience. Descriptive statistics on these variables can be consulted in table 1.

Gender is measured by a dichotomous variable (0 = *male*, 1 = *female*). Including gender in the analysis is important, as previous research showed a tendency of female students being more likely to participate in surveys (e.g. Avery et al. 2006). Female respondents are indeed overrepresented in the final sample as at the University of Antwerp, where 53.82 per cent of the total student population was female in the 2013-2014 academic year.

Age can also be expected to play a role, as older respondents might be less used to the completion of online surveys. Furthermore, older students may also have a different level of interest in the survey topic. This continuous variable is measured in years.

As the survey targeted students, educational level and/or income were not available as measures of their socio-economic background. As a result, I use parental education as a proxy for such background. The parental educational level is measured by an ordinal level variable ranging from 1 (primary education or less) to 9 (doctoral or equivalent level). I recoded this variable into three categories, based on the International Standard Classification of Education (ISCED 2011), namely a low (ISCED level 0-4), medium (ISCED level 5-6) and highly (ISCED level 7-8) educated group.

Given the fact that ethnic majority students are more likely to respond to survey invitations (e.g. Porter and Umbach 2006), I included a variable on respondents' national background. This variable is based on respondents' current nationality as shown on their passport, not their country of birth. I distinguished three groups, namely (1) Belgian citizens; (2) EU-nationals; and (3) non-EU nationals.

Lastly, response rates prove to be related to the topic (e.g. Porter 2004). Therefore, I included a control variable measuring topic salience. This variable is based on the question 'In which of the following international activities would you participate during your degree?'. Students could rate 12 activities on a Likert scale from 1 'Extremely unlikely' to 5 'Extremely likely'. I calculated the mean score on these 12 items with a restrictive sumscale (missing values were not allowed).

Table 1. Descriptive Statistics.

Variable	Mean	Standard Deviation	Minimum	Maximum	n
Age	21.65	4.59	15	61	4,322
Topic Salience	3.20	0.70	1	5	3,923
Variable	Categories	Percentage	Minimum	Maximum	n
Gender	Male	38.2	0	1	1,651
	Female	61.8			2,671
Education Mother	Low	34.4	1	3	1,460
	Medium	43.8			1,858
	High	21.8			926
Education Father	Low	35.3	1	3	1,477
	Medium	31.9			1,335
	High	32.8			1,372
Nationality	Belgian	87.2	1	3	3,767
	EU	10.1			437
	Non-EU	2.7			118

Results

Response rate evolution

The first response wave – after sending the invitation – yielded a response rate of 6.2 per cent, the first reminder an additional response of 10.3 per cent and the second reminder 8.6 per cent. The extra reminder to the initial refusers motivated 955 students to still complete the questionnaire, raising the total response rate with 6.1 per cent. As a result, the total survey response rate after the extra reminder was 31.2 per cent (n = 4,880). This last 6.1 per cent increase will be explored further, as I differentiated between four different reminder contents. 8.62 per cent of students that received a standard reminder completed the questionnaire. Of those who received the average time to complete the questionnaire, only 7.14 per cent replied. The most effective content seems to be the standard reminder mentioning the number of respondents, as 9.04 per cent of the students who received such a reminder completed the questionnaire. Finally, a 7.76 per cent response rate was observed among students who received both indications (time and number of respondents).

However, we cannot yet deduce from these numbers how the total response rate would change if I had opted exclusively for one of these reminders. Using the separate response rates for each group as the reference point, I calculate the number of students that would ideally answer the questionnaire if they all received the same invitation. From this number, I then calculate hypothetical response rates for each group. This analysis reveals that the final response rate would reach 31.54 per cent with a standard reminder, 30.43 per cent with a time indication, 31.85 when indicating the number of respondents, and 30.77 per cent when the last two indications are combined. In sum, these numbers suggest that it is the extra reminder rather than the content that increases the total survey response rate.

Differences between respondents and initial refusers

Finally, I investigated whether significant differences can be detected between early respondents, late respondents and initial refusers. Such analysis is helpful for unraveling whether the administrative effort and time cost of such an extra reminder pays off in terms of diversifying the final sample. Table 2 gives an overview of differences in demographic characteristics and topic salience between initial refusers and respondents participating in the normal survey cycle. The results show a significant difference in

terms of gender: male respondents are more likely to answer the extra reminder than the initial invitation. Furthermore, parental education differs between early respondents and initial refusers. The mothers of early respondents show to be less educated compared to those who answer the extra reminder. Nevertheless, it should be noted that such statistically significant differences are not observed when comparing late respondents (those who completed the questionnaire after two reminders) with initial refusers. The only difference between the latter is the nationality of respondents, with students with an EU-background being more likely to complete the questionnaire. No statistically significant differences could be detected, however, concerning respondents' age, fathers' educational background and students' interest in internationalization initiatives.

Table 2. Comparison of characteristics of respondents and initial refusers, percentages

	Early respondents (wave 1) vs. initial refusers (wave 4)			Late respondents (wave 3) vs. initial refusers (wave 4)		
	Wave 1 (n = 970)	Wave 4 (n = 955)	*X2*	Wave 3 (n = 1,348)	Wave 4 (n = 955)	*X2*
Gender			8.94**			0.00
Female	67.2	60.2		60.3	60.2	
Male	32.8	39.8		39.7	39.8	
Age (years)			4.05			9.22
15-18	16.3	13.1		16.4	13.1	
19-22	57.4	57.9		59.5	57.9	
23-26	18.6	20.9		16.5	20.9	
≥ 27	7.7	8.1		7.5	8.1	
Education Mother			7.89*			2.71
Low	37.7	31.2		34.7	31.2	
Medium	41.0	46.0		43.2	46.0	
High	21.2	22.9		22.2	22.9	
Education Father			0.12			2.27
Low	35.5	36.4		34.6	36.4	
Medium	32.9	32.6		31.1	32.6	
High	31.6	31.1		34.3	31.1	
Nationality			1.54			8.25*
Belgian	84.5	85.6		89.3	85.6	
EU	12.3	12.3		8.4	12.3	
Non-EU	3.2	2.2		2.3	2.2	
	Mean (SE)	Mean (SE)	*t*	Mean (SE)	Mean (SE)	*t*
Topic salience	3.22 (0.66)	3.20 (0.72)	0.75	3.21 (0.69)	3.20 (0.72)	0.36

Notes: * $p < .025$; ** $p < .001$ (Bonferroni correction for multiple comparisons). Statistical significance is measured by Chi-Square statistics.

Discussion and conclusion

Using a web survey administered to 15,651 university students, I investigated the impact of a late reminder on web survey response. With this methodological experiment, I aimed to investigate whether (1) initial refusers can still be motivated to participate in student surveys, which is relevant in times of increasing survey fatigue,

and (2) whether there are differences in the profile of respondents when comparing early and late response waves. Considering the first point, I showed that extra reminders are indeed helpful for raising response rates among student populations that are oversurveyed. The analysis suggests that standard reminders or reminders mentioning the number of people that already completed the questionnaire have the greatest potential for increasing response rates, whereas including the average time other respondents needed to complete the questionnaire appears to be the least effective. This suggest that students might be triggered by social desirability, and reconsider their participation if a substantial number of students already participated in the questionnaire. Nevertheless, it should be remarked that such reminders can also have a reverse effect, as mentioning the number might make students feel their answers are redundant.

Considering the second point, I observed that male students are more likely to participate in later waves of a survey, which is in line with the existing literature. Considering socio-economic background, the results are less conclusive: whereas differences regarding the educational level of respondents' mother were detected, no similar differences could be traced for respondents' father. This finding might reflect the substantive influence of mother's educational status on their offspring's demand for higher education (e.g. Albert 2000) as well as on their educational attainment (e.g. Korupp, Ganzeboom and Van Der Lippe 2002). As mothers' educational status is related to the trajectories of their sons and daughters throughout higher education, it is plausible this is also related to student's survey response behaviour. Finally, I also observed differences considering the ethnic background of students, with students with an EU background being more likely to participate in later waves of the survey. In sum, depending on the aim and scope of the survey, researchers can assess whether the effort of sending repeated reminders is worthwhile for reaching relevant respondents. If the aim is merely to obtain greater sample sizes, the results strongly suggest that repeated reminders are highly effective. All reminders significantly contributed to a response rate that is quite acceptable for current standards on web survey response rates among students. If the aim is, however, to diversify the collected sample, the results of the study are less conclusive.

Some limitations of the study should be acknowledged. First, this experiment was limited to one institution for higher education in a particular country, limiting the

generalizability of the results. The response rate of this survey can, on the one hand, be highly dependent upon the characteristics of the institution and its students (Porter and Umbach 2006), or, on the other hand, indicate that the implication strategy was successful, which is something to be confirmed or falsified by future web-based research or evaluations at other institutions for higher education, in Belgium as well as elsewhere. Second, it would have been interesting to cross-test the analysis with the same student cohort through other surveys. Unfortunately, this was not possible due to organizational and practical reasons. Future studies could address this weakness, cross-checking methodological experiments across different surveys with similar student samples. Such approach would be insightful for supporting or falsifying the presented results.

Finally, I acknowledge that the presented findings do not provide cutting-edge insights indicating the most promising venues for coping with student survey fatigue. Nevertheless, the analysis is useful for two purposes. First, it confirms previous insights on the relationship between the number of reminders and survey response, adding fresh empirical evidence to the scientific canon. As such, the presented results strengthen findings presented by other authors. Second, the analysis indicates that the financial and time-wise effort required for diversifying the content of reminders does not yield significant benefits in terms of increase in response rates. Therefore, the findings also have their practical value for researchers, as it sheds light on strategies that can be avoided. To conclude, it is my sincere wish that researchers and educational practitioners take the issue of student survey fatigue seriously. If we aim to base scientific knowledge as well as educational interventions on web-based student evaluations and surveys, maximizing efforts and developing tangible strategies to achieve acceptable response rates is of crucial importance.

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With the growing possibilities for conducting online surveys, researchers increasingly use such surveys to recruit student samples for research purposes in a wide array of social science disciplines. Simultaneously, higher education students are recurrently asked to complete course and teacher evaluations online and to participate in small-scale research projects of fellow students, leading to survey fatigue among student populations across the globe. One of the most frequently reported effects of over-surveying is a decrease in overall response rates. This situation has significant impacts on the generalizability and external validity of findings based on online surveys. The collection of reliable data is, nevertheless, crucial for researchers as well as educational practitioners and administrators, and strategies should be developed for achieving acceptable response rates. This paper reports on a methodological experiment (n = 15,651) conducted at the University of Antwerp, Belgium, in which possible strategies to improve student survey response are explored. I specifically focus on the impact of a late reminder as well as specific reminder contents on response rates. Furthermore, I investigate whether early respondents and initial refusers have different profiles.

The Netherlands Interdisciplinary Demographic Institute (NIDI) is an institute for the scientific study of population. NIDI research aims to contribute to the description, analysis and explanation of demographic trends in the past, present and future, both on a national and an international scale. The determants and social consequences of these trends are also studied.

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