Survey Research Methods (2014)
Vol. 8, No. 2, pp. 127-135
ISSN 1864-3361
http://www.surveymethods.org

Speeding in Web Surveys: The tendency to answer very fast and its association with straightlining

Chan Zhang
Insitute for Social Research
University of Michigan
Ann Arbor

Frederick G. Conrad
Institute for Social Research
University of Michigan
Joint Program in Survey Methodology
University of Maryland

Web surveys can be programmed to capture a variety of respondent paradata regarding how respondents answer questions. These paradata provide great opportunities for researchers to assess response quality, specifically whether respondents engage in satisficing – expending only enough effort to provide acceptable, but not necessarily accurate, responses. In particular, speeding (i.e., giving answers very quickly) has increasingly been used as an indicator for satisficing and low response quality. However, few studies have examined whether speeding actually reflects compromised response quality. To address this gap in the literature, the current study investigates speeding behaviors among Web respondents from a probability-based panel and whether speeding entails reduced response quality. We first identify and characterize respondents who speed more frequently than others over the entire questionnaire. To explore the impact of speeding on response quality, we then examine whether respondents who speed more frequently also straightline more than others – a behavior generally considered to reflect superficial thinking while answering. The results show that the tendency to speed is related to several respondent characteristics, particularly age (younger respondents are more likely than older respondents to speed). This study also reveals that respondents who are prone to speed are also prone to straightline regardless of their demographics. This suggests that the two behaviors arise from a common satisficing tendency. Moreover, the relationship between speeding and straightlining holds across age groups, suggesting speeding is as problematic for young as it is for old respondents. In addition, respondents' education matters: for the low-education respondents, speeding is associated with a drastic increase in straightlining, while the increase is more modest for the highly educated.
Keywords: Web surveys, satisficing, speeding, straightlining

1. Introduction

A fundamental concern about self-report data is satisficing – the tendency of respondents to provide satisfactory but not optimal answers in order to reduce their effort (Krosnick, 1991).[1] To assess satisficing, studies often examine the occurrence of certain types of answers that are likely to result from satisficing, such as respondents saying "Don't Know" when they do know or could know, agreeing with statements with which they might actually disagree (i.e., acquiescence) and giving non-differentiated (identical) ratings to a series of statements (so called straightlining) when more thought might lead to different answers for different statements. The underlying assumption is that more such behaviors indicate more satisficing and lower response quality. In particular, this logic has been often used in mode comparison studies to evaluate differences in response quality (e.g., Fricker, Galesic, Tourangeau, & Yan, 2005).

In addition to those traditional satisficing indicators that are based on the answers that respondents give, response time data captured in Web surveys can provide additional information on the response processes. Specifically, speeding – responding too fast to give much thought to answers – is likely to arise when respondents are motivated primarily to finish the questionnaire rather than provide careful and accurate responses.

Not all quick responses are instances of speeding or even indicative of measurement error. In fact, in psychological research, faster response times usually reflect simpler mental processes and are associated with lower error rates. In research on attitudes, faster response times indicate greater stability and accessibility: Fazio and his colleagues (e.g., Fazio, Powell, & Williams, 1989) found that faster response times were associated with more extreme ratings as one would expect when attitudes are more fully formed. Similarly, Bassili and Fletcher (1991) found that people who did not change their attitudes when confronted with a counterargument responded faster than those who did change, suggesting more

Chan Zhang, Institute for Social Research, 426 Thompson Street, Room 3424, Ann Arbor, MI 48104-1248 (chanzh@umich.edu)

[1] "Survey satisficing," as Krosnick (1991) called it, is adapted from the original, influential idea proposed by Simon (e.g., 1956).

stable ("crystallized") attitudes among those who did not change. This type of research uses response times to understand the character of attitudes, not to assess the quality of responses, although more stable attitudes presumably produce better quality answers.

In survey research, response times have been widely examined as a proxy for respondent burden. In Web surveys, faster response times are often assumed to indicate a more efficient design. For example, Tourangeau, Couper, and Conrad (2004) found that it took respondents less time to answer when the response options were in logical order (congruent with expectations) compared to when they were not. Response times have also been used to identify difficult questions. For example, Draisma and Dijkstra (2004) found that longer response times were associated with incorrect answers in a validation study with a series of binary (yes/no) factual questions. In addition, response times have been proposed as a way to identify badly worded questions (e.g., Bassili, 1996). Clearly, faster response times in those studies do not necessarily indicate reduced data quality.

Speeding in surveys is not a matter of "faster" responses but of extremely fast responses; just as in driving, speeding occurs when a threshold is exceeded – a threshold with at least some theoretical basis. Speeding thresholds should be set low enough to capture answers that are unreasonably fast. At the limit, speeding occurs when respondents arbitrarily select a response option and press the "next" button without reading the question.

Although in practice speeding has already been widely used as an indicator for low respondent engagement and poor data quality, very few studies have assessed whether speeding is indeed related to satisficing. Malhotra (2008) found that speeding was associated with primacy effects, especially among low-education respondents. Conrad, Tourangeau, Couper, and Zhang (2011) observed a similar association between speeding and straightlining across a relatively small set of items. Wells, Rao, Link, and Pierce (2012) found that respondents who sped more were less likely to choose "other" and elaborate on their answers.

Given the sparse evidence about speeding and survey data quality, the current study aims to expand our understanding of this phenomenon in the following areas: (1) the measurement of speeding; (2) the type of respondents who are likely to speed; and (3) the implications of speeding for response quality. Specifically, we first describe how we measure speeding and the rationale for this approach. We then report which respondent characteristics affect the tendency to speed. To evaluate whether speeding is related to satisficing, the study examines whether speeding is associated with straightlining in grid questions, a well-known response style in Web surveys. Although straightlining can arise from factors other than respondents' attempt to reduce their effort,[2] a positive relationship between the two behaviors will suggest that they have a common origin – satisficing. If this is the case, we will consider it as the evidence that speeding is indeed related to reduced response quality. We also examine whether this relationship differs across demographic groups to assess whether speeding is more detrimental to response quality for some respondents than others.

2. Methods

Dataset and Calculation of Response Time

The data analyzed in this study are from the wave 5 Politics and Values Survey conducted by the MESS project (http://www.centerdata.nl/en/MESS) and administered to its LISS panel (Longitudinal Internet Studies for the Social Sciences). The LISS panel is a probability-based Web panel of households in the Netherlands drawn from the population register maintained by Statistics Netherlands. The Politics and Values Survey is one of the core, annually administered LISS panel surveys. The survey on which the current article is based was fielded in December 2011 and again in January 2012 for the December non-respondents. The completion rate is 78.9% (5,814 completes out of 7,372 invited panel members).[3]

Response times are calculated as the elapsed time between submission of an answer to the previous and current question, based on time stamps collected on the server. Among the 5,814 respondents, 132 respondents who were younger than 18 years old were only asked a subset of the questions and for 159 respondents the timestamps were missing for one or more questions.[4] Because this study compares respondents on their speeding status over the entire questionnaire, these respondents are not included in the analyses. We also exclude follow-up questions, because they are not administered to all respondents. If respondents answer a question more than once, it is only the first response time that is considered in the determination of speeding.

The final dataset for the analyses includes 5,523 panelists, with response times for 54 questions. (Appendix 2 shows the demographic distributions of the respondents in the final dataset.)

Threshold for Speeding

In principle, any response time that is shorter than the amount of time required to produce the optimal response can be considered speeding. Although this is conceptually straightforward, in practice it is difficult to determine the optimal response time. Although a few studies (Couper & Kreuter, 2013; Yan & Tourangeau, 2008) have analyzed the influences of question-level and respondent-level characteristics on response times, the response times examined in their

[2] For example, it is possible to that some straightlining might reflect respondents' actual views, e.g., the respondent actually agrees with each statement to the same extent.

[3] In this study, a response is counted as a complete if the respondent went through all the questions and submitted the questionnaire at the end. The item nonresponse is rare for the majority of completes. About 50% of completes have missing data on 2 or fewer questions (out of 54 questions).

[4] The missing data appear to be random across questions, and we are not clear about the exact cause. But given that the missing data involve less than 3% of all the respondents (159 out of 5,814), we are not concerned about their impact here.

Table 1 Number of questions on which respondents sped (out of a total of 54)

Mean	25th Percentile	Median	75th Percentile
15.4	8	14	21

studies were the actual time respondents spent answering questions, not the optimal time required to answer the questions accurately.

The current study employs a simple measure of speeding. Specifically, we set the speeding threshold as 300 milliseconds (msec) per word, a rough estimate of reading speed,[5] multiplied by the number of words in the question. The idea behind this approach is that when response times are faster than likely reading times, respondents are unlikely to have given the question adequate thought. Note that in this study we do not attempt to accurately determine speeding on individual questions for individual respondents. Rather, our goal is to use this generic threshold to identify the respondents whose response times tend to fall on the lower end more often than others.

3. Results

Prevalence of Speeding

On average, respondents sped on about 15 out of the 54 questions (see Table 1). Respondents varied considerably in how often they sped, with those in the top quartile speeding on 21 or more out of 54 questions (see Table 1). The question, then, is whether the respondents who sped more often did so consistently throughout the questionnaire. To examine this, we split the questionnaire into two parts so that mean completion time was about the same for both parts. For each part of the questionnaire, we grouped respondents into four quartiles based on the number of questions on which they sped, and compared their speeding status between the first and second half the questionnaire.

As shown in Table 2, respondents' speeding tendency was relatively consistent across the questionnaire: among respondents who sped least frequently (1st quartile) and most frequently (4th quartile) in the first part of the questionnaire, the majority (66.9% and 65.0%, respectively) remained in the same quartile for the second part of the questionnaire. These findings suggest that, at least in this study, speeding is not a variable or intermittent behavior but likely a stable characteristic of respondents.

In this study, we are particularly interested in the group of respondents ranked in the highest quartile of speeding frequency in both parts of the questionnaire (emphasized in Table 2). We refer to these respondents as "persistent speeders." We next examine the characteristics of these persistent speeders.

Characteristics of Persistent Speeders

We used logistic regressions to model the likelihood of being a persistent speeder (i.e., being in the highest quartile of speeding frequency in both parts of the questionnaire). The explanatory variables included age (18-34, 35-44, 45-54, 55-64, >=65), gender, level of education (primary school, junior high, senior high, junior college, college, and university[6]) , respondent origin (Dutch vs. First/second-generation immigrants), tenure on the panel (whether the household joined the panel in 2007, or after 2007), early vs. late respondents (whether the respondent completed the survey in December or in the non-respondent follow-up in January), and whether the household received any device (computer[7], Internet connection, or both) from the panel to complete surveys. Among these variables, education, gender and origin had no significant impact on the likelihood of persistent speeding with the control of the other covariates; thus, they were removed from the regression and the estimates from the final model are presented in Table 3 below.

Table 2 Speeding frequency in the second half of the questionnaire as percentage of speeding frequency in the first half*

Speeding freq. in the 1st part of the questionnaire	Speeding frequency in the 2nd part of the			
	1st Quartile	2nd Quartile	3rd Quartile	4th Quartile
1st Quartile	66.9	28.7	4.3	0.2
2nd Quartile	23.0	50.3	23.1	3.6
3rd Quartile	4.4	26.8	45.2	23.7
4th Quartile	1.9	9.5	23.7	*65.0*

*Quartiles are calculated based on the number of questions on which respondents sped in each part of the questionnaire.

The regression reveals a strong monotonic decrease in persistent speeding as respondents get older. This can also be seen in Figure 1, which shows the percentage of persistent speeders dropping from over 40% among those age 18-34 to less than 5% among those 65 and older. One may argue that this pattern reflects the established finding that older respondents tend to be slower than younger respondents because of cognitive aging (cf. Schwarz, Park, Knauper, & Sudman, 1999). In addition, the age difference in speeding may be also related to different motivations, if older respondents are somehow more willing to expend time and effort in answering the questions than younger respondents.

The regression analyses also show lower prevalence of persistent speeders among respondents who received any device from the panel compared to others. One possible explanation is that respondents with a provided device may have less experience using computers and the Internet and, there-

[5] This is slower than the typical reading speed among college students for comprehension, which is about 200 msec per word (e.g., Carver, 1992).

[6] These education categories are used by CBS (Statistics Netherlands).

[7] Either a laptop or a simPC is provided by the LISS panel administrators to panel member without an internet-enabled device. A simPC is a small and simple computer (more information at http://www.lissdata.nl/lissdata/About_the_Panel/Equipment).

Table 3 Final logistic model predicting persistent speeding

	Estimate	Standard Error	Odds Ratio	*p*-value
Intercept	0.041	0.08	1.042	0.596
Age group (ref: 18-34)				
35-44	−0.845	0.10	0.430	< 0.001
45-54	−1.333	0.11	0.264	< 0.001
55-64	−2.199	0.13	0.111	< 0.001
≥65	−3.474	0.21	0.031	< 0.001
Received any device	−0.564	0.19	0.569	0.003
Joined after 2007	−1.077	0.12	0.341	< 0.001
Former non-respondents	−0.334	0.11	0.716	0.002
Former non-resp. × Joined after 2007	0.896	0.27	2.450	0.001

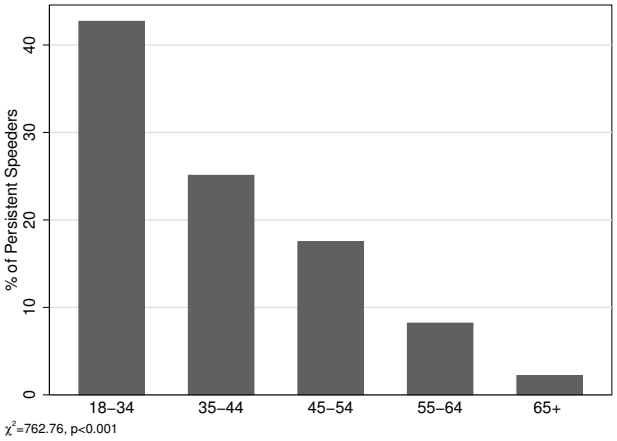

Figure 1. Percentage of persistent speeders by age groups

fore, may take more time to navigate through the questionnaire than other respondents. Another possibility is that these respondents may feel more obliged to expend effort on the surveys because the survey organization has provided them the device.

The results also show a tenure effect – i.e., more speeding among respondents who joined the panel earlier. Moreover, the interaction term indicates the tenure effect was reduced among January respondents. There are two possible explanations for the tenure effect: First, respondents who had been on the panel longer might be more familiar with the questions (as the survey is conducted annually with some questions recurring), thus taking them less time to complete the questionnaire;[8] second, these veteran respondents might be more subject to survey fatigue having completed many monthly questionnaires compared to the newer panel members and, therefore, they might be more likely to rush through the survey. However, it is not clear why the tenure effect was smaller among those who responded in January compared to those who responded earlier.

Regarding the differences between early and late respondents, researchers generally believe that response propensity can be associated with response quality if there are some common factors (e.g., interest in the topic) that correlate with both people's decision to participate and the level of effort they are willing to spend in the survey if they do participate. Empirical evidence of the association between response propensity and response quality has been found by Fricker and Tourangeau (2010) and Kaminska, McCutcheon, and Billiet (2010). So in this study we expected January respondents (December non-respondents) to be more likely to speed persistently than the December respondents. As shown in Table 3, this is only observed among those who joined the panel after 2007 (odds ratio=0.716 × 2.450=1.754). Among those who joined the panel earlier, the difference is reversed (odds ratio=0.716). One explanation is that respondents who have been in the panel longer are generally more committed to the study than newer respondents; nonresponse among relatively committed panel members may be less related to response quality than is nonresponse among those who are less committed.

As discussed above, there were clear demographic predictors of persistent speeding and different explanations for why some respondents sped more than others could lead to different conclusions about whether speeding was related to reduced data quality. To determine this, we examined the relationship between speeding and straightlining (reported in the next section). If fast responding results from respondents' unwillingness to expend effort answering the questions, then persistent speeders should be more likely to exhibit satisficing, in particular straightlining. We examine this in the next section.

Relationship between Speeding and Straightlining

Toward the end of the survey, respondents answered a series of grid questions – a type of survey question in which multiple items with the same response scales are displayed in a table-like format in which the items – usually statements – are the rows and the response categories appear as the columns. These grid questions in the questionnaire

[8] This could be due to reduced reading time for familiar questions. The "thinking time" could also be somewhat reduced if respondents tend to have more accessible answers to familiar questions.

asked about opinions on a variety of topics, mostly on 5-point scales (see Appendix 1 for the wording). The analysis focused on straightlining – i.e., choosing the same response option for all the items in a grid so that the selected answers are in a vertical line. We excluded one grid question consisting of only two statements.

We first investigated at the question-level how speeding is associated with straightlining. As can be seen in Table 4, across all 8 grid questions examined, respondents who sped on the question were substantially more likely to straightline than respondents who did not speed.

We then examined the association between the overall speeding tendency throughout the questionnaire and straightlining on these grid questions. The simple bivariate analysis showed that, across the 8 grid questions, persistent speeders straightlined on approximately two questions, while others straightlined on approximately one question (1.9 vs. 1.0, $t = -20.28$, $p < 0.001$).

We also conducted regression analyses to further understand the relationship between speeding and straightlining, controlling for demographic variables. Specifically, we used negative binomial regressions[9] to model the number of grid questions on which respondents straightlined. The explanatory variables include respondents' speeding tendency (persistent speeder vs. not) as well as the demographic variables we have used in the speeding model (i.e., age, gender, education, origin, tenure, early vs. late respondents, and whether they received any device from the panel). In addition to the main effects, we also tested interaction effects between speeding tendency and the demographic variables. The findings (effects significant beyond the .05 level) are shown in Table 5.

The main effect of respondent speeding tendency (i.e., whether respondents engaged in persistent speeding or not) has the coefficient of 1.125. Although the interaction effects in the model have negative coefficients, the absolute values are all smaller than 1.125. This suggests that speeding was positively related to straightlining across all respondents, although this relationship was stronger in some subgroups than others.

In particular, the regression reveals strong interactions between speeding tendency and respondent education levels with regard to the effect on straightlining. While within all educational groups persistent speeders straightlined more than others, the differences were particularly large among the less educated respondents. If the focus is on the impact of education on straightlining, Figure 2 shows that among persistent speeders, the amount of straightlining increased considerably among the less educated groups but when respondents did not speed persistently, the level of straightlining was quite similar across education groups.

In addition to education, the model shows that the association between speeding and straighlining was also moderated by gender, with the relationship stronger among men than women.

Note that there was no significant interaction between speeding tendency and age. In other words, we did not find evidence that the impact of speeding on straightlining differed across age groups. Speeding seemed to compromise response quality as much for young respondents as for old respondents.

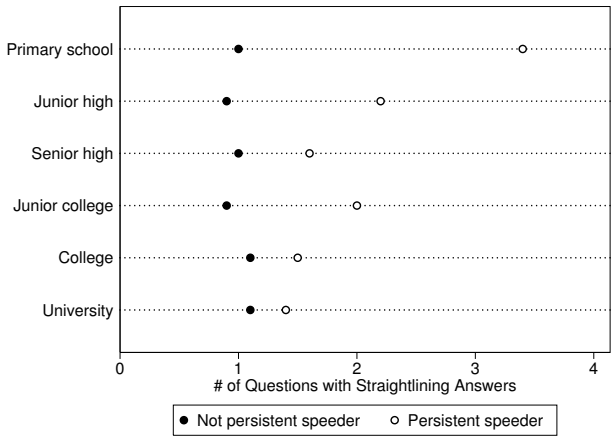

Figure 2. Number of grid questions with straightlining answers by speeding tendency and education

4. Discussion

This study reveals several aspects of speeding that help us understand how speeding is related to survey data quality. First, we found that respondents who sped more often than others early in the survey were likely to continue speeding more than other respondents throughout the questionnaire. This suggests that speeding may be a respondent level characteristic, not just the behavior of a particular respondent at a particular point in the questionnaire. It is worth noting that many satisficing indicators are not evident across the entire questionnaire. For example, Tourangeau, Medway, and Presser (2013) found that satisficing indicators, such as item nonresponse and acquiescence, were only weakly associated across the two halves of a Web survey. Hence, these indicators may not be as useful as speeding for identifying disengaged respondents, but they may help detect question-driven satisficing (e.g., very difficult and burdensome questions).

Second, we found that speeding was positively related to straightlining on grid questions, a relatively unambiguous measure of quality, and this relationship held across different demographic groups, i.e., persistent speeders were more likely to straightline in all age groups, for both genders and in all education groups. However, the relationship was stronger for some groups than others. In particular, persistent speeders with low levels of education were especially likely to straightline. Similarly, Malhotra (2008) found that low-education respondents were more prone to primacy effects as

[9] The dependent variable here (i.e., the number of grid questions where respondents straightlined) is essentially count data. Accordingly, we tried to fit both Poisson regressions and negative binomial regressions. Because of overdispersion in the Poisson model, we chose the negative binomial model.

Table 4 Comparison of straightlining between respondents who sped on the grid question and those who did not

	% Straightlining			
Grid Questions	Speeding	Not Speeding	χ^2	p-value
Working mothers	28.3	9.1	255	< 0.001
Role of father/mother in households	21.7	8.3	198	< 0.001
Foreigners/immigrants	32.4	0.9	1274	< 0.001
Marriage	30.6	0.7	1276	< 0.001
Taking care of parents	41.8	13.8	468	< 0.001
Women w/ kids & working	49.6	26.9	235	< 0.001
Attitudes towards women	27.6	12.9	180	< 0.001
Questionnaire evaluations	21.6	8.4	89	< 0.001

Table 5 Parameter estimate for negative binomial model predicting number of grid questions on which respondents straightlined (across 8 grid questions)

	Estimate	Standard Error	Odds Ratio	p-value
Intercept	0.165	0.07	1.180	0.021
Persistent speeder	1.125	0.11	3.081	< 0.001
Age group (ref: 18-34)				
35-44	0.035	0.05	1.036	0.456
45-54	−0.011	0.05	0.989	0.817
55-64	−0.139	0.05	0.871	0.004
≥ 65	−0.300	0.05	0.741	< 0.001
Female	0.137	0.03	1.146	< 0.001
Persistent speeder × female	−0.154	0.07	0.857	0.020
Education (ref: primarcy school)				
Junior high	−0.125	0.07	0.883	0.058
Senior high	−0.150	0.08	0.860	0.061
Junior college	−0.201	0.07	0.818	0.004
College	−0.016	0.07	0.984	0.812
University	−0.026	0.08	0.975	0.757
Persistent speeder × junior high	−0.367	0.13	0.693	0.004
Persistent speeder × senior high	−0.630	0.14	0.533	< 0.001
Persistent speeder × junior college	−0.395	0.13	0.674	0.002
Persistent speeder × college	−0.810	0.13	0.445	< 0.001
Persistent speeder × university	−0.835	0.15	0.434	< 0.001
Joined after 2007	−0.195	0.04	0.823	< 0.001
Dispersion coefficient*	0.211	0.02		

*This positive value suggests overdispersion, justifying the use of negative binomial model.

they sped. Thus, both of these findings suggest that speeding is particularly problematic for low-education respondents. This also suggests that speeding thresholds, i.e., what counts as speeding, could be refined on the basis of respondent education levels (where the threshold would be quicker for more educated). Because the relationship between speeding and straightlining was unaffected by respondent age, the current results do not argue for adjusting the speeding threshold on the basis of age .

However, knowing what speeding means for data quality does not make the data quality better. There are a few steps survey practitioners can take based on information about speeding. One is to implement speeding interventions during a survey – i.e., reminding respondents they were answering very fast and asking them to slow down. This approach has been tested in a series of experiments by Conrad and his colleagues (i.e., Conrad et al., 2011; Zhang, 2013). Consistently, they found the intervention helped reduce speeding with virtually no impact on break-offs and they found additional evidence of improved data quality. Another approach is to include the speeding information (e.g., the total incidences of speeding and the speeding status on a particular question) with final survey datasets. This additional information on speeding might help users interpret the data and explain puzzling patterns. For example, it is possible that speeding as a result of careless responding might dampen a correlation between two variables. Hence, it may be worth finding out how the correlation would be affected if the data

from the speeders were removed.[10]

We want to be clear that the relationship between speeding and straightlining reported here is correlational. We are not suggesting that one behavior causes the other. Zhang (2013) found in an experiment that intervening when respondents either speed or straightline on a series of grid questions can reduce the occurrence of both behaviors. This may suggest that speeding and straightlining arise from common origins, rather than one causing the other.

Admittedly, the level of effort people are willing to expend on a Web survey can be influenced by a variety of factors, e.g., incentives, questionnaire design, survey length, and types of panels (see Couper, 2000; Tourangeau, Conrad, & Couper, 2013) which, in turn, affect the likelihood they will speed. However, our focus is not on speeding prevalence per se but the implications of speeding for overall quality. The main point is that in Web surveys – where no one is monitoring the respondent – there is ample opportunity for respondents to truncate their thinking when answering, and some respondents exploit this opportunity more consistently than others. Understanding the consequences of such least effort strategies is a first step in designing online questionnaires that promote greater thought by respondents and, thus, better data.

References

Bassili, J. N. (1996). The how and why of response latency measurement in telephone surveys. In N. Schwarz & S. Sudman (Eds.), *Answering questions: Methodology for determining cognitive and communicative processes in survey research.* San Francisco: Jossey-Bass.

Bassili, J. N., & Fletcher, J. F. (1991). Response-time measurement in survey research a method for CATI and a new look at nonattitudes. *Public Opinion Quarterly*, *55*(3), 331-346.

Carver, R. P. (1992). Reading rate: Theory, research, and practical implications. *Journal of Reading*, *36*(2), 84-95.

Conrad, F. G., Tourangeau, R., Couper, M. P., & Zhang, C. (2011). *Interactive interventions in web surveys can increase response accuracy.* (Paper presented at the 2011 annual meeting of the American Association for Public Opinion Research, Phoenix, AZ.)

Couper, M. P. (2000). Web surveys - a review of issues and approaches. *Public Opinion Quarterly*, *64*(4), 464-494.

Couper, M. P., & Kreuter, F. (2013). Using paradata to explore item level response times in surveys. *Journal of the Royal Statistical Society: Series A (Statistics in Society)*, *176*(1), 271-286.

Draisma, S., & Dijkstra, W. (2004). Response latency and (para)linguistic expressions as indicators of response error. In S. Presser et al. (Eds.), *Methods for testing and evaluating survey questionnaires.* New York: Wiley.

Fazio, R. H., Powell, M. C., & Williams, C. J. (1989). The role of attitude accessibility in the attitude-to-behavior process. *Journal of Consumer Research*, *16*(3), 280-288.

Fricker, S., Galesic, M., Tourangeau, R., & Yan, T. (2005). An experimental comparison of web and telephone surveys. *Public Opinion Quarterly*, *69*(3), 370-392.

Fricker, S., & Tourangeau, R. (2010). Examining the relationship between nonresponse propensity and data quality in two national household surveys. *Public Opinion Quarterly*, *74*(5), 934-955.

Kaminska, O., McCutcheon, A., & Billiet, J. (2010). Satisficing among reluctant respondents in a cross-national context. *Public Opinion Quarterly*, *74*(5), 956-984.

Krosnick, J. A. (1991). Response strategies for coping with the cognitive demands of attitude measures in surveys. *Applied Cognitive Psychology*, *5*(3), 213-236.

Malhotra, N. (2008). Completion time and response order effects in web surveys. *Public Opinion Quarterly*, *72*(5), 914-934.

Schwarz, N., Park, D., Knauper, B., & Sudman, S. (1999). *Cognition, aging, and self-reports*. Philadelphia, PA: Psychology Press.

Tourangeau, R., Conrad, F. G., & Couper, M. P. (2013). *The science of web surveys*. New York: Oxford University Press.

Tourangeau, R., Couper, M. P., & Conrad, F. G. (2004). Spacing, position, and order: Interpretive heuristics for visual features of survey questions. *Public Opinion Quarterly*, *68*(3), 368-393.

Tourangeau, R., Medway, R., & Presser, S. (2013). *The relations among different cognitive shortcuts in surveys.* (Paper presented at the 2013 annual meeting of the American Association for Public Opinion Research, Boston, MA.)

Wells, T., Rao, K., Link, M. W., & Pierce, C. (2012). *Flagging speeders in a multi-mode (mobile and online) survey.* (Paper presented at the 2012 annual meeting of the Midwest Chapter of the American Association for Public Opinion Research, Chicago, IL.)

Yan, T., & Tourangeau, R. (2008). Fast times and easy questions: The effects of age, experience and question complexity on web survey response times. *Applied Cognitive Psychology*, *22*(1), 51-68.

Zhang, C. (2013). *Speeding and non-differentiation in web surveys: Evidence of correlation and strategies for reduction.* (Paper presented at the 2013 annual meeting of the American Association for Public Opinion Research, Boston, MA.)

Appendix 1. Wording of the Eight Grid Questions

Grid_Q1 For each statement, please indicate to what extent you agree or disagree.

- A working mother's relationship with her children can be just as close and warm as that of a non-working mother.
- A child that is not yet attending school is likely to suffer the consequences if his or her mother has a job.
- Overall, family life suffers the consequences if the mother has a full-time job.
  1. fully disagree
  2. disagree
  3. neither agree nor disagree
  4. agree
  5. fully agree

Grid_Q2: And to what extent do you agree or disagree with the following statements?

- Both father and mother should contribute to the family income.
- The father should earn money, while the mother takes care of the household and the family.

[10] This is an example of using respondent paradata to supplement and enhance survey data.

- Fathers ought to do more in terms of household work than they do at present.
- Fathers ought to do more in terms of childcare than they do at present.
    1. fully disagree
    2. disagree
    3. neither agree nor disagree
    4. agree
    5. fully agree

Grid_Q3: What is your opinion on the following statements?

- It is good if society consists of people from different cultures.
- It is difficult for a foreigner to be accepted in the Netherlands while retaining his/her own culture.
- It should be made easier to obtain asylum in the Netherlands.
- Legally residing foreigners should be entitled to the same social security as Dutch citizens.
- There are too many people of foreign origin or descent in the Netherlands.
- People of foreign origin or descent are not accepted in the Netherlands.
- Some sectors of the economy can only continue to function because people of foreign origin or descent work there.
- It does not help a neighborhood if many people of foreign origin or descent move in.
    1. fully disagree
    2. disagree
    3. neither agree nor disagree
    4. agree
    5. fully agree

Grid_Q4: What is your opinion on the following statements?

- Married people are generally happier than unmarried people.
- People that want to have children should get married.
- A single parent can raise a child just as well as two parents together.
- It is perfectly fine for a couple to live together without marriage intentions.
- For a couple that wants to get married, it is good to first start living together.
- A divorce is generally the best solution if a married couple cannot solve their marital problems.
- It is all right for a married couple with children to get divorced.
    1. fully disagree
    2. disagree
    3. neither agree nor disagree
    4. agree
    5. fully agree

Grid_Q5: What is your opinion on the following statements?

- Children ought to care for their sick parents.
- When parents reach old age, they should be able to live with their children.
- Children that live close by ought to visit their parents at least once a week.
- Children ought to take unpaid leave in order to care for their sick parents.
    1. fully disagree
    2. disagree
    3. neither agree nor disagree
    4. agree
    5. fully agree

Grid_Q6: Do you think that women, under the circumstances described below, should be able to have a full-time job, a part-time job, or no job at all?

- If she has a baby (a child younger than 1 year).
- If she has a child that does not yet attend school.
- After the youngest child starts primary school.
- After the youngest child starts secondary school.
    1. full-time
    2. part-time
    3. no job at all

Grid_Q7: The following statements are on marriage, the duties of husbands and wives, and about rearing boys and girls. Please read each statement and indicate to what extent you agree or disagree.

- A woman is more suited to rearing young children than a man.
- It is actually less important for a girl than for a boy to get a good education.
- Generally speaking, boys can be reared more liberally than girls.
- It is unnatural for women in firms to have control over men.
    1. fully disagree
    2. disagree
    3. neither agree nor disagree
    4. agree
    5. fully agree

Grid_Q8: Finally; what did you think of this questionnaire?

- Was it difficult to answer the questions?
- Were the questions sufficiently clear?
- Did the questionnaire get you thinking about things?
- Was it an interesting subject?
- Did you enjoy answering the questions?
    1. certainly not
    2.
    3.
    4.
    5. certainly yes

Appendix 2. Respondent Demographics in the Final Dataset

	Proportion (in %)
Gender	
Male	46.7
Female	53.3
Age	
18-34	20.1
35-44	16.7
45-54	19.3
55-64	21.7
≥=65	22.2
Education	
Primary school	8.0
Junior high	25.9
Senior high	10.9
Junior college	23.6
College	23.1
University	8.5
Origin	
Dutch	88.5
Immigrant	11.5
Tenure	
Joined the panel in 2007	73.0
Joined the panel after 2007	27.0
Early vs. late respondents	
Responded in December 2011	83.5
Responded in January 2012	16.5
Received any device	8.6
n	5523