

Exploring Causes and Effects of Perceived Response Burden

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Abstract

Statistical organizations care about the response burden caused by their data requests. One reason for this is the assumption that a too high response burden may result in lower data quality and higher costs for data collection. This paper explores the validity of these assumptions. Data from a satisfaction survey of respondents to the annual Structural Business Survey in the Netherlands are used to explore the causes of perceived response burden and how this burden affects response behavior. The findings indicate that 1) perceived burden is both affected by actual burden (time spent) and the attitude towards statistics and the statistical agency requesting the data; 2) perceived burden affects the timeliness of response.

Key Words: Perceived burden, actual burden, response behavior, data collection costs, Structural Business Survey

1. Introduction

The European Statistics Code of Practice (Eurostat, 2011) states: “The reporting burden should be proportionate to the needs of the users and should not be excessive for respondents. The statistical authorities monitor the response burden and set targets for its reduction over time.” There are two main reasons why National Statistical Institutes (NSIs) should be careful about the response burden caused by business surveys. Firstly, there are political and economic concerns about the costs incurred by businesses to comply with government regulations, and mandatory reporting for statistics is a part of that ‘administrative burden’. According to the European Commission High Level Group of Independent Stakeholders on Administrative Burden (2009) “...statistics is an area of great concern for businesses, mainly due to the high *perceived* burden, the so-called irritation burden”. Secondly, response burden may affect the quality of the collected data and the costs of data collection for NSIs. Several, mostly qualitative, studies on response burden in business surveys indicate that businesses themselves sometimes reduce a high response burden by supplying less than accurate data (e.g. Hedlin et al., 2005; Giesen, 2007; Bavdaž, 2010). This can be detrimental to the quality of the statistics based on these data and may result in high costs of data collection (e.g. more reminders needed, more time spent by help desk staff) and editing.

This paper explores causes and effects of perceived response burden by analyzing quantitative data. Data of a Customer Satisfaction Survey amongst respondents of the Dutch Structural Business Survey are used to explore 1) how actual burden and attitudes

towards the statistical agency and statistics affect perceived burden and 2) how perceived burden affects the timeliness of response. The data and methods used are discussed in more detail in section 2. Section 3 describes the results. The paper ends with conclusions in section 4.

2. Methods

Statistics Netherlands (SN) annually conducts a Customer Satisfaction Survey amongst several target groups (Beukenhorst et al., 2005). In 2006, a sample of respondents of the Dutch Structural Business Survey (SBS) was contacted for a short CATI interview asking questions about the completion of the SBS questionnaire and the respondents' opinion about SN. The SBS is a mandatory annual survey that collects data about all costs and revenue of a business. The questionnaires used for the SBS vary by size class and type of industry; typically larger businesses are asked to provide more specifications than smaller businesses (and thus larger businesses receive larger questionnaires) and the types of items asked can differ over industries. See Giesen & Hak (2005) for a more detailed description of the SBS questionnaires.

In 2006 the Satisfaction Survey was conducted in two waves, the regular study in summer with a sample of early SBS respondents and one additional wave in winter with a sample of late respondents. For the winter survey additional questions were asked about the time taken to complete the survey and the perceived usefulness of the SBS statistics. In general the response rate for the (voluntary) Satisfaction Survey is rather high; in 2006 it was 80%. In total 2210 respondents to the SBS were interviewed, of which 1260 in the first wave and 950 in the second wave. Due to routing and partial non-response number of respondents may vary in the results presented below.

Perceived burden is measured with two questions. The first question assesses *perceived cognitive burden* by asking respondents whether they thought answering the SBS questions is 'easy', 'neither easy, nor difficult' or 'difficult'. The second question assesses *perceived time burden* by asking whether respondents found answering the questions was 'much work', 'neither much, nor little work' or 'little work'. These measurements of perceived burden are based on the recommendations in the Handbook for Monitoring and Evaluating Business Survey Response Burdens (Dale and Haraldsen, 2007).

The first set of analyses presented below study to what extent both aspects of perceived burden are affected by actual burden, e.g. the time spent completing the questionnaire, and by the attitudes of the respondents towards the statistical agency and statistics.

An indicator for actual burden, available for all respondents, is the number of items on the questionnaires. This number varies over the different versions of the SBS questionnaires between 56 and 511 with a mean of 125 items. For the analyses a variable was created categorizing the length of the questionnaire in 6 groups, ranging from 1-75 items to 176 and more items. For the respondents of the winter wave additional information on the actual burden is available. In this wave two additional questions about the actual burden were asked: "How much time did it take to collect all information necessary for completing the questionnaire?" and "How much time did it take you to actually fill in the questionnaire?". Answers to both questions were given in minutes spent. Based on our observations of the response process of the SBS in the field, we

recoded reports of more than 40 hours for either collecting data or completing the questionnaire into 40 hours. The total time spent (collecting and completing added) ranged from 3 minutes to 60 hours, with a mean of 4 hours. This total time was recoded into a variable indicating whether respondents had spent less than one hour, 1-2 hours, 2-4 hours, 4 to 8 hours or more than 8 hours.

As an indicator for the overall attitude towards SN a question is used which asks respondents to rate their overall satisfaction with SN with a grade between 1 and 10 (corresponding to the Dutch system of grading in schools, where a grade lower than 6 is “not satisfactory”). Additionally, for respondents in the second wave only, we have information about how they feel about the usefulness of the statistics resulting from the SBS questionnaires. Questions assessed the perceived usefulness of the SBS statistics for both the respondents’ business and for society. The answer categories for both questions were “very useful”, “somewhat useful” and “not useful”.

To study how both actual burden and attitudes affect perceived burden two sets of logistic regression analyses were conducted using forward, stepwise selection. The dependent variable was always a dummy variable indicating if respondents had reported either cognitive burden (“difficult to complete the questionnaire”) or time burden (“much work to complete the questionnaire”). Independent variables used were actual burden, attitude towards SN and the SBS output and the type of industry a business is in (to test for any industry specific effects) and the size class of a business (measured as number of employees in four categories).

To study the effects of perceived burden on response behaviour we looked at the timeliness of the response. This was measured as a dummy variable, with a value of 1 for timely responses and 0 for responses that were received after the due date. Here also logistic regression analysis was conducted using forward selecting, including actual burden, perceived burden, attitude towards SN and type of industry.

3. Results

3.1 Causes of perceived response burden

In the total sample 25% of the respondents report cognitive burden, that is, they find the SBS questionnaire difficult. A much larger part reports time burden, 56% says completion of the questionnaire is much work. No relationship was found between the number of items (measured in six categories) and cognitive burden, but cognitive burden differed significantly with the time spent (with the highest level of burden for those spending either 2-4 hours or 4-8 hours, results not reported here). As can be expected, perceived time burden differed significantly over the different categories of actual burden, both measured as number of items and time spent. The higher the actual burden, the higher the perceived burden (results not reported here).

On average respondents grade SN with a 6.5 on a 1 - 10 scale. According to the Dutch system of rating school grades this would be a bit above satisfactory. 13% of the respondents give a grade below 6, an unsatisfactory grade. Table 1 shows that perceived burden differs significantly with the level of overall appreciation of SN. Respondents who give lower grades also perceive more burden, both in terms of cognitive burden and

time burden. For example, of those who give an unsatisfactory grade, 43% finds the SBS questionnaires difficult, whereas of those who give a more than satisfactory grade only 19% finds the questionnaire difficult.

Table 1: Perceived burden by satisfaction with Statistics Netherlands (SN)

Opinion about SN	Perceived cognitive burden		Perceived time burden		Total (100%)
	‘easy’ or ‘neither easy, nor difficult’	‘difficult’	‘little work’ or ‘neither much, nor little work’	‘much work’	
unsatisfactory (<6)	57%	43%	21%	79%	279
satisfactory (6)	67%	33%	31%	69%	428
more than satisfactory (>=7)	82%	19%	54%	46%	1297
don’t know / refusal	73%	27%	42%	58%	178
Total	75%	25%	44%	56%	2182
Chi square (df=3)	88,279***		138,607***		

For the winter wave of the Satisfaction Survey we have information about how respondents see the usefulness of the SBS statistics (N=939). Overall, 66% of the respondents think that the results of the SBS are not useful for their business and 19% thinks the results are not useful for society. Both perceived cognitive burden and perceived time burden vary significantly with the perceived usefulness of the SBS statistics (results not presented here). The highest levels of burden are found for respondents who see the least use of the statistics. For example, of those who find the SBS statistics not useful for society 78% report that they find the questionnaire much work, whereas those who think the results are very useful to society this is 60%.

The results from the multivariate logistic regression analyses (final models resulting from forward stepwise selection) are presented in tables 2 and 3. Table 2 presents the results for all respondents, both from the early and the late wave of the satisfaction survey. For this group we have number of items (recoded into 4 categories) available as an indicator of actual response burden and the general grade given for SN as an indicator of the attitude towards SN (recoded in a dummy variable indicating if the respondents gave a grade lower than 6, which we can see as being dissatisfied with SN). The results show that from the variables included (actual burden, size class, attitude and type of industry) only being dissatisfied with SN significantly affects whether or not respondents find completion of the questionnaire difficult. Whether they find completion much work is affected both by the actual burden (groups with a larger number of items on the questionnaire perceive a higher time burden), size of the business (with larger businesses experiencing a higher time burden) type of industry (with respondents from Trade have a significant lower likelihood of finding that the questionnaire much work than respondents from Construction) and the opinion about SN.

Table 2: Logistic regression of perceived response burden: all respondents

	Questionnaire is difficult (cognitive burden)		Questionnaire is much work (time burden)	
	B	S.E.	B	S.E.
Aantal items (ref=1-75 items)				
76-100			,154	,177
101-125			,469*	,213
126-150			,705**	,238
151-175			,838**	,279
176+			,611*	,305
Business size (ref=0 employees)				
1-9 employees			,330*	,156
10-99 employees			,473*	,204
100+ employees			,814**	,269
Type of industry (ref=Construction)				
Manufacturing			-,216	,217
Trade			-,588**	,196
Commercial Services			-,474*	,218
Not satisfied with SN (grade <6)	,934***	,134	1,306***	,159
Constant	-1,242	,058	-,306	,248
Nagelkerke R square		0,034		0,131
N		2013		2011

*** p<.001 ** p<.01 *p<.05

Table 3 shows that with a better measurement of actual burden (time spent instead of number of items) actual burden is significantly related to whether or not respondents find the questionnaire difficult. Midsized businesses (10-99 employees) have a slightly significant lower likelihood of perceiving the questionnaire as difficult than the smallest businesses. We also see that, next to the actual burden, a general dissatisfaction with SN as well as perceiving SBS statistics as uselessness for their own business is significantly related to finding the questionnaire difficult. Note that both usefulness for society and type of industry are not selected in these models. Maybe any effects of the type of industry that were found in the analyses for all respondents (see Table 2) are reflected in the more accurate measurement of actual burden. For perceived time burden (whether or not the questionnaire is seen as “much work”) we see similar patterns as for the cognitive burden, but for the effect of size class. Even with actual time spent included in the model, the attitude towards SN and the usefulness of the SBS statistics for the own business are significantly related to finding the questionnaire much work.

Table 3: Logistic regression of perceived response burden: respondents from the winter wave of the satisfaction survey only

	Questionnaire is difficult (cognitive burden)		Questionnaire is much work (time burden)	
	B	S.E.	B	S.E.
Time spent (ref=<1 hour)				
1-2 hours	,958***	,265	1,163***	,219
2-4 hours	1,965***	,260	2,534***	,266
4-8 hours	1,830***	,292	2,575***	,345
8+ hours	1,444***	,327	2,530***	,391
Business size (ref=0 employees)				
1-9 employees	,154	,297		
10-99 employees	-,499 ⁺	,275		
100+ employees	-,265	,360		
Not satisfied with SN (grade <6)	,623**	,211	1,238***	,321
SBS output useless for own business	,630**	,185	,855***	,187
Constant	-2,196***	,321	-1,214***	,192
Nagelkerke R square	0,189		0,347	
N	786		785	

*** p<.001 ** p<.01 *p<.05 ⁺ p<.10

3.2 Effects of perceived response burden on timeliness

Overall, only 33% of all respondents send in the questionnaire in time (before the due date).

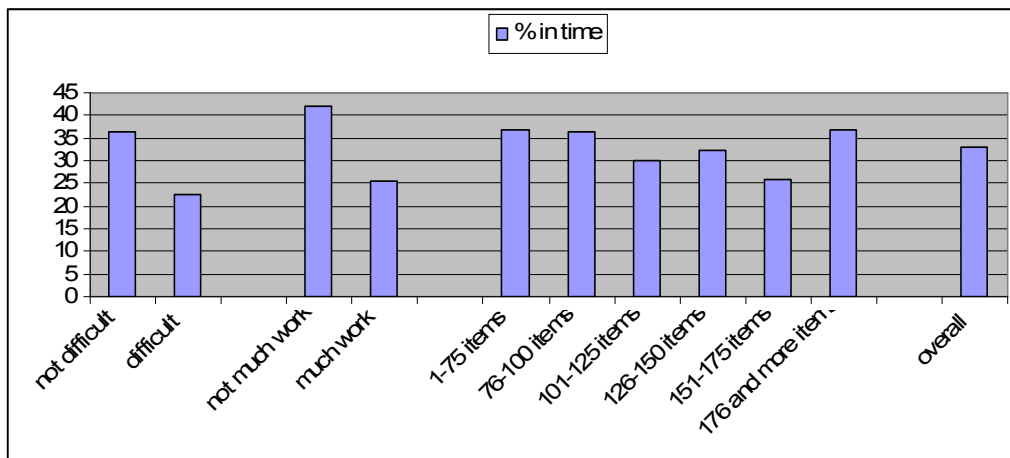


Figure 1: Percentage of timely respondents related to perceived and actual burden

As is shown in Figure 1, the highest levels of timely responses are found for respondents with a low perceived and actual burden (differences are significant, results not presented here). For example, of those respondents who find the questionnaire difficult only 23% returns the questionnaire in time, whereas of the respondents who find the questionnaire 'easy' or 'neither easy, nor difficult' 36% returns the questionnaire in time. Timeliness differs for different sizes of the questionnaires (number of items), but these differences are not significant.

To study the effects of both actual and perceived burden on timeliness of the response, a logistic regression analyses was conducted with timely response as the dependent variable (1=timely, 0=late). A timely response was defined as receiving the questionnaire before or at the formal due date. Businesses who had requested and received an extension of the deadline (26% of the businesses) are also considered late respondents in this definition. One reason for this is that many extensions of the deadline are requested after the first reminder and it was not possible to make an accurate distinction based on the time of a request of extension. Also, from the point of view of the production process we would like first of all to see how burden affects diversions from the planned deadline. In a forward selection procedure the following independent variables were included: actual burden (number of items), perceived cognitive burden, perceived time burden, being dissatisfied with SN, size class and the type of industry. Only the perceived burden variables were selected in the final model, see Table 4.

Table 4: Logistic regression of timely responding (all respondents)

	B	S.E.
Finds questionnaire difficult	-,373**	,129
Finds questionnaire much work	-,560***	,104
Constant	-,361***	,069
Nagelkerke R square		,40
N		2004

*** p<. 001 ** p<. 01

It was not possible to do these analyses for the respondents of the winter survey only (where we could have used a better measure of actual burden) as all respondents in this group are late respondents.

4. Conclusion and discussion

The analyses presented in this chapter shed some light on factors affecting perceived response burden and the relationship between perceived response burden and response behaviour. The results show that both perceived cognitive burden and perceived time burden are related to actual burden, the attitude towards the statistical agency and the perceived usefulness of statistics for the own business. Also, the results show that perceived burden is related to the timeliness of the response.

These findings corroborate three important assumptions: 1) perceived burden is not only affected by actual burden, but also by attitudes (towards the statistical agency and statistics); 2) perceived burden affects response behaviour and through that 3) the costs of data collection costs (costs for sending out reminders). Also, based on these findings one can speculate that perceived response burden may affect the quality of resulting data, as late responses may affect the timeliness of the output.

These findings confirm that reducing perceived response burden should be a priority for NSIs. This study also offers some indications on how NSIs can reduce perceived burden: both by reducing actual burden and by influencing how respondents feel about the statistical agency and the usefulness of statistics for their own business. These findings suggest that - even for surveys where actual response burden cannot be reduced further - we may reduce perceived burden by improving the image of the statistical agency and the perceived usefulness of the resulting statistics for the businesses.

Arguably, the causality of the relationship between opinion about the statistical agency and perceived burden can also run the other way: a negative response experience (experiencing high burden) may result in a negative opinion about the statistical agency in general. However, as shown in tables 2 and 3, even when actual burden is included in the model, a negative judgment about the agency still adds significantly to explaining perceived burden. It seems indeed plausible that the respondents' opinion about the statistical agency and the usefulness of statistics may reflect the perceived benefits of responding (or the lack thereof) and thus influences perceived burden.

These results indicate that improving communication with business respondents and informing them about how they can use statistics may be a promising means to improve perceived burden. See also related work from the BLUE-ETS project for a discussion of motivation of respondents in businesses surveys (Torres van Grinsven, Bolko and Bavdaž, 2012) and the use of NSI statistics by businesses (Lorenc et al., 2012). However, clearly more research is needed to test this hypothesis. An experiment with the Swedish SBS survey (Hedlin et al., 2008) found that an enclosure promising personalized benchmark feedback increased the respondents' perceived usefulness of statistics for their own businesses but did not affect perceived response burden. One important issue for further research is to what extent characteristics of the respondent (e.g. educational level, position in the business) and the businesses (e.g. size class) affect both attitude towards statistics and perceived response burden. More insight is also needed in how actual and perceived response burden affect the costs and quality of data collection. Finally, more knowledge is needed about how and to what extent statistical agencies can improve their image amongst businesses and explain respondents to business surveys that statistics are also useful for their businesses.

Acknowledgements

The research reported herein was funded by the European Community's Seventh Framework Programme (FP7/2007-2013) under grant agreement n°244767. The views expressed in this paper are those of the author and do not necessarily reflect policies of the European Community or Statistics Netherlands. The author would like to thank Ger Snijkers for his comments on an earlier version of this paper.

References

Beukenhorst, Dj., Israëls, A., Kroeze, D., Riele, S. te, & Vree, M. de, (2005). *Klanttevredenheidsonderzoek 2005 (In Dutch. Customer satisfaction survey)*. Internal Report, Statistics Netherlands .

- Bavdaž, M. (2010). Sources of Measurement Errors in Business Surveys, *Journal of Official Statistics*, 26 (1), 24-42.
- Dale, T. & Haraldsen, G. (Eds.) (2007). *Handbook for Monitoring and Evaluating Business Survey Response Burdens*. European Commission, Eurostat.
- Eurostat (2011), European statistics code of practice for the national and community statistical authorities. Adopted by the European Statistical System Committee 28th September 2011.
- European Commission High Level Group of Independent Stakeholders on Administrative Burdens (2009). *Opinion of the High Level Group. Subject: Priority Area Statistics*. Brussels, July 7, 2009.
- Giesen, D & Hak, T. (2005). *Revising the Structural Business Survey: From a Multi-Method Evaluation to Design*. Proceedings of the Federal Committee on Statistical Methodology Research Conference, November 14-16 2005, Arlington, Virginia.
- Giesen, D. (2007). The Response Process Model as a Tool for Evaluating Business Surveys. *Proceedings of the Third International Conference on Establishment Surveys (ICES-3)*, 18-21 June, Montreal, Canada, pp 871-880. Alexandria, VA: American Statistical Association.
- Hedlin, D., Dale, T., Haraldsen, G. and Jones, J. (Eds.) (2005). *Developing Methods for Assessing Perceived Response Burden*. Research report, Stockholm: Statistics Sweden, Oslo: Statistics Norway, and London: Office for National Statistics.
- Hedlin, D., H. Lindkvist, H. Bäckström and J. Erikson (2008). "An Experiment on Perceived Survey Response Burden Among Businesses". *Journal of Official Statistics*, 24(2), 301-318.
- Lorenc, B., Bavdaž, M., Giesen, D., Seljak, R. and Torres van Grinsven, V. (2012). *Businesses as users of official statistics*. Paper presented at The Fourth International Conference on Establishment Surveys (ICES-4), Montreal, Canada, June 11-4 2012.
- Torres van Grinsven, V., Bolko, I. and Bavdaž, M. (2012). *Sources of motivation in business surveys*. Paper presented at The Fourth International Conference on Establishment Surveys (ICES-4), Montreal, Canada, June 11-14 2012.