DESIGN OF WEB SURVEY QUESTIONNAIRE AND QUALITY OF RESPONSES

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ABSTRACT
The first objective of this research is to propose a conceptual framework with a view to studying the effects of on-line questionnaire design on the quality of collected responses. Secondly, we will display the results of an experiment where different protocols have been tested and compared using the basis of several quality indexes.
Starting from some previous categorizations, and from the main factors identified in the literature, we propose an initial global framework of the questionnaire characteristics in a web survey, divided into five groups of factors. Our framework was built to follow the response process successive stages of the contact between the respondent and the questionnaire itself. Following another complementary approach, inspired by the Information Systems theories, the web questionnaire could be considered as a medium and this point of view claims an active consideration of the user contribution to what constitutes a medium.
In a second part, because it has been studied in the survey methodology literature in a very restricted way, the concept of “responses quality” is discussed and extended with some more “qualitative” criteria, that could be helpful for researchers and practitioners, in order to obtain a deeper assessment of the survey output.
As an experiment, on the basis of the factors chosen as major characteristics of the questionnaire design, 8 versions of a questionnaire related to young people’s consumption patterns were created. The links to these on-line questionnaires were sent in November 2005 to a target of 10,000 young people. The article finally presents the results of our study and will discuss the conclusions. Very interesting results come to light (especially the influence of interaction, question wording and user signification dimensions on responses quality) and describe the effects of the questionnaire design characteristics on the quality of data.

Keywords: Web surveys, questionnaires, response quality,
INTRODUCTION

Web-based surveys have been substantially developing for the last 5 years. In the United States, the Esomar association (2004) estimates that more than one third of market research is now conducted in the country through on-line surveys. An international professional panel run by a survey software editor on more than 7,000 institutions, indicates that at the beginning of 2006, 32% of them implement on-line surveys, through an internal or an external network.

Simultaneously to this practitioner concern, academic research was gradually becoming interested in the topic and was producing numerous contributions, in order to better understand these new methods of data collection (Best & Krueger, 2004, Schonlau, Fricker & Elliot, 2002). Logically, the first papers focused on the description of the various technological devices (Galan & Vernette, 2000), with a view to pointing out the opportunities and the drawbacks of these new protocols (Ilieva, Baron & Healey, 2002, Couper 2002). Internet surveys have been compared to other self-administrated methods or to telephone protocols (Roster & al., 2005), mainly on the response rate criteria (Schmidt & al., 2005) and recently on responses quality (Fricker & al., 2005).

It is now established that web-based surveys are inexpensive, with a short response time and that they can achieve satisfying response rates compared to questionnaires delivered by
“classical” mail (if preceded by a notification). Additionally, the nature and the quality of responses are not inevitably affected (Tuten, Urban & Bosnjak, 2002). Some authors even suggest that on-line surveys provide more complete information than traditional mail surveys do (Ilieva, Baron & Healey, 2002). They can also avoid some data quality problems such as social desirability bias (Fricker & al., 2005) or survey “satisficing” patterns (Skitka & Sargis, 2005). For researchers, Internet surveys can also facilitate the use of embedded experiments (Mc Fadden and al., 2005).

After several years of experience, we consider that web surveys are especially well adapted to internal surveys (staff evaluation or social satisfaction), to access panels and more generally to a well identified target population, particularly in a Business-to-Business context (Roster and al., 2004), customer satisfaction surveys for example. As far as Business to Consumer surveys are concerned, the medium coverage could still be a methodological difficulty. Even if this problem is now gradually decreasing, it could still be dissuasive in many cases. Because of the inability to identify all on-line users, web-based surveys do not provide generalisable results, due to self-selection, non-random and non-probabilistic sampling (Andrews, Nonnecke & Preece, 2003).

Comparing data from online and telephone (Schillewaert & Meulemeester, 2005) or face-to-face protocols (Duffy & al., 2005), some experiments showed that the nature of the responses can be similar (for interests, attitudes or voting intentions for example) or sometimes different (knowledge or behaviour patterns). For some other authors (Roster & al., 2004), web surveys may be equally, if not more, accurate than phone surveys in predicting behaviours.

In academic research, a movement has been progressively established with a view to defining the circumstances in which we could obtain the best responses quality. Our paper is part of this research trend. In fact, in recent published research, numerous experiments on the topic provide us with some very promising results. But on this subject, it seemed necessary to define a more precise conceptual framework, both for the responses quality indexes and for the influence of survey design characteristics (and more specifically the questionnaire itself). Then, the first objective of our research is to propose a general conceptual model in order to study the effects of on-line questionnaire design on the quality of collected responses.

The different sources of errors in surveys are well identified and defined. A reference work on the topic (Groves, 1989) distinguishes four major types of error sources: coverage, sampling,
non-response and measurement. Our research is mainly focused on the last source of error: measurement. For web surveys, this error is linked first to the respondent attitude towards the survey (motivation, comprehension, distortion etc.) and of course, to the questionnaire itself: design, wording, illustration etc. We will also give special attention to non-response error, that is not completely separated from measurement error and could be critical within the context of on-line studies, especially with the problem of the “drop-outs”.

1. THE DECISION TO PARTICIPATE IN A SURVEY AND THE RESPONSE PROCESS

Before proposing a theoretical framework of the determinants of responses quality in a web-survey, it is necessary to describe the decision process implemented when a person is asked to participate in a survey and also the components of the response process itself.

1.1. The response process

As far as the decision process is concerned, from a psychological point of view, several authors (Groves, Cialdini & Couper, 1992) concentrated on the works made on “compliance warrants”. The “compliance with requests” approach insists on six principles that influence the decision to perform a requested activity, such as the active participation in a survey: reciprocation, consistency (“desire to be consistent within attitudes, beliefs, words and deeds”), social validation (how similar others are acting), authority, scarcity and liking. In addition to these theoretical concepts, Groves, Cialdini & Couper (1992) introduced some practical knowledge drawn from professional survey interviewers’ contributions. Two important components are outlined by experienced interviewers within the techniques they use to obtain good participation: tailoring (Groves & Couper, 1998) and maintaining interaction. On the basis of the classical literature on persuasion and attitude change, Bosnjak & Tuten (2001) established the importance of motivation, opportunity and ability in the message information process: a motivated person will naturally tend to process the message more fully.

On the basis of these psychological theories, the authors reviewed the factors that may influence the participation in a survey. They are basically divided into four categories: the societal-level factors, the characteristics of the sample person, the attributes of the interviewer and finally, the attributes of the survey design. The performance of these
attributes is affected by the sample person individual characteristics, on the basis of the “leverage-salience theory” proposed by Groves, Singer & Corning (2000).

The components of the response process itself were fully described by Tourangeau, Rips and Rasinski (2000). The process is made of four stages: comprehension, retrieval, judgment and finally response. For them, the presentation of the questionnaire is one of the most important variables that may affect the response process especially at both the comprehension and reporting (response) stages. They conclude their chapter on the comprehension component by giving some practical advice for survey designers, that are generally “consistent with the evidence and theoretical analyses” presented by the experts (Bradburn & Sudman, 1979, Converse & Presser, 1986). This advice covers various aspects of the questionnaire design, and focuses on the importance of simplicity of syntax.

1.2. The web questionnaire as a medium

Following an approach inspired by the Information Systems theories, the web questionnaire is considered as a medium. One calls “medium” a specified technology (T.V., press, web application...) that is used for an organisational or managerial goal (public information, advertising, data collection...) and intended to a target audience (citizens, readers, sample of respondents...). The state of a given medium is the result of three contingent forces: technology, management and user. This point of view claims an active consideration of the user contribution to what constitutes a medium. It is not only a matter of designing an application according to the technological possibilities or promises and the managerial goals or expectations. One needs to be aware that, from acceptance to diversion, the user is an active designer of the medium, as may be the technicians or the managers.

This equilibrium can be regarded as driven by the following criteria:

- **Satisfaction**: this is the point of view of the technician. His/her concern is to satisfy the needs of the end user by the specification of technological functions,

- **Efficiency**: this is the point of view of the manager whose objective is that the medium makes the end user more efficient and the organisational action more productive, according to quantitative or qualitative criteria,
- **Signification**: this is the point of view of the end user. What does it mean for him/her to use the medium? Apart from responding to the technician’s offer or to the manager’s demand for productivity, the use of a medium is also a private matter involving, for example, the capability to conform or the will to be creative.

In our research, we will try to take all these important aspects into account, while trying not to forget the “signification component”, whose impact is very seldom analysed in the survey methodology literature. The signification component is associated to a social logic that will determine the user’s particular position, considering his/her needs and desires (Orlikowski, 2000).

In this area of design of web survey questionnaire and quality of responses, we think that past research have four major limitations, which we will mainly address in this article:

1. No conceptual framework is really available to give an exhaustive description of the topic
2. In the survey methodology literature, the respondent is often considered as a passive subject
3. Some important features specific to web surveys (illustration and especially interaction) have seldom been studied in the past
4. Response quality has received much less research attention than response rate, and with a rather restricted view.

**2. The questionnaire characteristics affecting the response patterns**

Especially for web-based surveys, most researchers focus on the attributes of the survey design. This is probably because they are in fact the only factors that can be manipulated when implementing a web survey and also because electronic surveys offer a wide range of design possibilities that can have great influence on the quality of the collected data (Couper, 2002). Despite the voluminous mass of relevant research data concerning response effects, few theoretical frameworks are available to structure this knowledge. Based on the Bradburn & Sudman (1979) proposals, Dijkstra & Van der Zouwen (1982) first designed a general
model of the survey interview. It is divided into three sets of variables influencing the response patterns: the characteristics of the questions themselves, the interviewer variables and the respondent variables. More specifically, the question factors are split into two groups: the formal characteristics and the content-related ones. Structural-task characteristics (such as method of administration, instructions and so on) are described as moderating variables that would condition the relationships between the basic factors and the responses (see figure 2).

![Figure 2 - Determinants of the response patterns by Dijkstra & Van der Zouwen (1982)](image)

Most of the authors say (Couper, Traugott & Lamias, 2001, Dillman, 2000) – and we also think – that as far as web surveys are concerned, a deeper investigation is needed on the first part of the general model: the relationships between the questionnaire characteristics and the response patterns. It is known that within self-administrated surveys, in the absence of an interviewer, the respondent tends to seek information from the instrument itself: the verbal and visual elements of the questionnaire (Schwarz, 1996). With the absence of an interviewer, another main factor is expected to play a major part: the incentive message displayed by the survey managers to the respondents (Göritz, 2004).

This means that for web surveys the issue of the questionnaire design is crucial. Then, the first objective of this paper is to specify the primary part of the general theoretical framework and
to propose a structure for the questionnaire attributes that may have an impact on the quality of the responses.

Within the literature dedicated to survey methodology, many contributions provide tips and hints on how to write a “good” questionnaire in order to get “good” responses. A lot of experimental studies are available but most of them are often limited in scope and do not take all the specific aspects of a web survey into account.

At the end of the survey we ran as an experiment, we asked the respondents to rate the questionnaire with a mark from 0 (very poor) to 10 (excellent). Then, with an open question, we asked them to justify their assessment, by explaining why they gave such a mark. From the content analysis made conjointly by 3 experts (on a sample of 550 answers), we identified the six most frequent criteria quoted by the respondents to illustrate their satisfaction with the questionnaire design characteristics. 47% of the sample mentioned at least one of the formal characteristics of the questionnaire. Among these answers, the wording and the response formats came first, then, the length and the general structure. Finally, illustration and interactivity were evoked. These results show that our model is quite coherent with the comments spontaneously given by the respondents of our Internet survey.

<table>
<thead>
<tr>
<th>Topics of the comments</th>
<th>Nb % obs.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Format of expected answers</td>
<td>91 16.6%</td>
</tr>
<tr>
<td>Wording</td>
<td>89 16.2%</td>
</tr>
<tr>
<td>General structure</td>
<td>53 9.7%</td>
</tr>
<tr>
<td>Length</td>
<td>52 9.5%</td>
</tr>
<tr>
<td>Illustration</td>
<td>30 5.5%</td>
</tr>
<tr>
<td>Interaction</td>
<td>19 3.5%</td>
</tr>
<tr>
<td>Total</td>
<td>549</td>
</tr>
</tbody>
</table>

Table 1 – Justifications of the questionnaire assessments by the respondents (content analysis)

2.1. The general structure of the questionnaire: length of the survey.

From the beginning of the history of research on survey methodology and design, this first category of questionnaire characteristics has been very frequently studied and more specifically the length of the questionnaire. Common sense first suggests that a long
questionnaire will obtain a lower response rate than a short one. Some contributions recommend an optimal length ranging between 15 and 30 questions for self-administrated questionnaires, even if it can be empirically considered as too brief for substantial market and academic research. Much research focuses on the effect of the length of the questionnaire on the return or response rates. In many general contributions on survey methodology (Foddy, 1993 for example), one recommends a concise drafting. A too long questionnaire would produce on the respondent an effect of “weariness”. A tendency to reproduce systematic answers (and thus to reduce their variability) is also reported at the end of long questionnaires (Herzog & Bachman, 1981). As a matter of fact, the literature about either traditional mail surveys or Internet-based surveys provides mixed results. For traditional surveys, Dillmann’s Total Design Method (1983) stated that a mail questionnaire must be perceived as easier and faster to complete and more visually appealing and interesting, to obtain higher response rates. However, a complete quantitative review concludes that the questionnaire length is almost uncorrelated with the response rate, there seems to be “a negative but very weak relation” between the variables (Yu & Cooper, 1983). Then, if we consider the findings of three recent reviews made specifically on Web-based surveys, the results seem to be contrasted (Galesic, 2002). On the one hand, statistically, the questionnaire length is not particularly associated to the response rate (Cook, Heath & Thompson, 2000). On the other hand, researchers and practitioners stress the length of the questionnaire as the largest problem for high drop-out rates (Lozar Manfreda & Vehovar, 2002).

Apart from the number of questions, the length of the questionnaire can also be perceived by the respondent on the basis of the number of screens, for example, the distinction between one and multiple-page design has been frequently discussed (Couper, Traugott & Lamias, 2001, Lozar Manfreda, Batagelj & Vehovar, 2002, Reips, 2002, Ganassali & Moscarola, 2004). One of the conclusions was that a one-page design resulted sometimes in higher item non-response or in more non-substantive answers. More generally, it is accepted that different questionnaire structures can lead to different response patterns.

Obviously, the length of the questionnaire is linked to the required effort perceived by the target audience of the survey. To help the respondent to estimate his/her position in the completion process (and to indicate how far they are from the end), some authors advise to use a point of completion (POC) indicator (Dillmann, Tortora & Bowker, 1998). It seems that a POC indicator would reduce dropouts later in the survey (Healey, Macpherson & Kuijten,
but if the questionnaire is very long, it may not be effective in reducing break-offs (Conrad, Couper & Tourangeau, 2003).

Internet-based surveys offer the opportunity to track more precisely the respondent behaviour during the interview session. Previously used by some researchers, the log files provide factual information about the on-line response process: how the person navigates from one screen to another, how many pages are seen and above all, where he or she quits. In our study, with the information available on the “SphinxOnLine” survey server, we had the opportunity to analyse the survey log files in order to measure the drop-out rates and the “drop-out points”.

2.2. Illustration of the form: visual information in web surveys

The Internet has introduced new opportunities for the illustration of questionnaires. In surveys, we can distinguish verbal information from visual information. This visual information can be displayed on three different levels: questions on which images play a major part (such as brand recognition questions for example), images as supplements with the text (i.e. embellishments, illustrations) and incidental images (i.e. background). The most problematic situation seems to be the second because the target audience might not know whether the images are designed as task or style elements (Couper, Tourangeau & Kenyon, 2004). Opinions are divided on the impact of illustrations on the quality of the responses. On the one hand, pictures may enhance the attractiveness of the questionnaire and may make it more convivial for the respondent; on the other hand, these visual features make the questionnaire more difficult to access or complete, which could reduce the response rate (Deutskens & al., 2004). Couper, Tourangeau & Kenyon (2004) found little support for a positive effect of illustrations on respondents’ enjoyment or reduction of perceived burden. However, exploring presentational influences, Ganassali & Moscarola (2004) have measured increased responses when relevant visual clues are presented in web interviews. More investigation is needed to test the effects of these various types of illustration on responses quality.

2.3. The wording of the questions
The length of the questions, the grammatical syntax and the level of language have been frequently studied in the survey methodology literature. In this area, we find a lot of general contributions that provide advice on “how to write good questions”. For example, some authors traditionally suggest that the length of the questions should not exceed 20 words (Payne, 1951) or that short questions would reduce the probability of respondents misunderstanding (Molenaar, 1982). Some experimental research have tried to measure the effects of these wording features on the quality of the responses and they do not seem to strongly support this hypothesis (Bogen, 1996).

As far as the wording itself is concerned, the methodological guidelines agree to recommend a “simple syntax”. A complex wording would also lead to a higher probability of misunderstanding and consequently to a lower response quality (Foddy, 1993). However, in the literature, the concept of “complex syntax” is seldom defined or measured. Belson (1981), after studying more than 2,000 questionnaires, built a framework of the so-called “difficult” questions where the more frequent ones are questions with special clauses, negative questions, questions including conjunctions, or multiple-timed questions. From another point of view, Brennan & Holdershaw (1999) demonstrated that the length, form and cue tone of an open-ended question have a significant effect on both the length and tone of the generated responses. On these aspects again, more detailed research is needed to define and evaluate the effects of the grammatical syntax of the questions, on the quality of the generated responses.

2.4. The challenge of interaction

For most authors (see Stewart & Pavlou, 2002), the particularity that differentiates Internet from other traditional media is its “potential for interactivity”. Interaction is considered as one of the most relevant opportunities of the web-based interviews (Conrad, Couper & Tourangeau, 2003). Nowadays, most of the Internet surveys are managed by an integrated server application. This means that – if it has been programmed – the server is able to react to the person’s received answers. Usually, the answers are sent to the server at the end of each screen (or page), some applications even send the data at the end of each question. What could be the server’s reactions? What do we mean by “interaction” within a web survey?

Basically, the questionnaire can be adapted to the respondents’ profile, presenting only the adapted questions. The server can provide some automatic jumps or display conditions. But, it can also provide some additional information (time elapsed, level of completion, details,
explanations etc.) if apparently needed or asked by the respondent. The survey designer can also develop some conditional instructions or sentences, based on the previous answers or in the absence of any answer. For Best & Krueger (2004) or Conrad & al. (2005), researchers possess several interactive options for promoting more accurate survey data or optimising the quality of responses, such as progress indicators, missing data messages, answer feedbacks, continuation procedures or even social presence.

Some sophisticated softwares (see for example www.sphinxonline.com) allow the survey designer to easily develop some various and complex scenarios. This is to create and maintain a kind of interaction with the respondent, taking into account multiple combinations of his/her previous answers to ask him/her very personalised questions. The ultimate objective would be to simulate a so-called “tailored” interview: a very important component outlined by experienced interviewers to obtain good participation (Groves & Couper, 1998).

A few recent works have studied the impact of automatic interactive questionnaires on the quality of the collected data. But we must say that the interactive features that have been analysed are (on average) not very rich and that few complex situations have been experimented. Nevertheless, the first results (Ganassali & Moscarola, 2004) give some interesting perspectives on the effect of these features, and our research will try to go further in the investigation.

2.5. The format of the expected answers

The impact of the response format on the quality of the collected data in self-administrated surveys has been frequently studied. It has been demonstrated (Reips, 2002, Christian & Dillman, 2004) that the graphical presentation of the response formats do influence the answers to Internet surveys. For example, Smith (1995) recognized that when respondents were given a larger space for an open-ended question, they wrote longer answers. As far as closed questions are concerned, some experiments (Heerwegh & Loosveldt, 2002), showed that radio-buttons can slightly be preferred to drop-boxes, because of their positive impact on response rates in a Web context. In addition to that, the choice of the response format (radio-buttons vs. drop-boxes again) may clearly lead to different response distributions (Couper & al., 2004). More precisely, some other experiments (Tourangeau, Couper & Conrad, 2004) demonstrated that even the spacing of the response options affects the selection of the answers.
2.6. The signification for the respondent

The models taken from the information systems literature can give useful and interesting additions to the classical survey methodology models. Stewart and Pavlou (2002) have suggested that “structuration theory” was an attractive conceptual framework for understanding interactive marketing communications” (such as surveys). We are convinced that it is relevant to consider the web survey questionnaire as a medium in which the end user (the respondent) could play an active part depending on the “signification” he/she gives to his/her task. The actors associate with particular technologies and their uses, meanings and attachments, emotional and intellectual. This is shaped by their experiences with various technologies and their participation in a range of social and political communities. This “user” point of view could influence the effort and the general attitude of the response and could affect his/her response patterns. Some authors emphasized that answers to Internet surveys have “various levels of commitment” on the part of the respondent that can explain response patterns (Tuten, Urban & Bosnjak, 2002). The user “signification” concept (Orlikowski, 2000) coming from Giddens’ (1984) structure theory can be divided into several aspects:

- The relationship the user has with the **facilities**: for instance the available time and the attractiveness of the technology. Do I have time to spend on the task, am I used to these kinds of technologies? Do I like it?
- The **norms** perceived by the user: is the respondent aware of any rule about his/her expected behaviour. Are there community rules or norms? (for example to help each other amongst students) Are rules needed? Does the person tend to act in a conforming way? Does he/she follow any authority (for example a teacher)?
- The user’s **interpretive schemes**: does the respondent look for pleasure, power or creativity while filling in the questionnaire? Does he or she feel like an expert?

“Interpretative schemes, facilities and norms are the mediation variables that are used by actors (for surveys: the respondents) to communicate signification and make sense of their interaction” (Stewart and Pavlou, 2002).

As measurements of these concepts, the respondents were asked to rate the questionnaire with a mark from 0 (very poor) to 10 (excellent). Then, we asked them to justify their evaluation,
by explaining “why did they give this mark”. We ran a content analysis on 550 answers and coded if the respondent mentioned any “signification” criteria and which ones (facilities, norms or interpretive schemes). The tables below show the results of the content analysis and the frequency of every user signification component. Almost half (47%) of the respondents explicitly mentioned at least one of the signification dimensions in their remarks.

<table>
<thead>
<tr>
<th>User Signification</th>
<th>Nb</th>
<th>% cit.</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>291</td>
<td>53.0%</td>
</tr>
<tr>
<td>Evoked signification</td>
<td>258</td>
<td>47.0%</td>
</tr>
<tr>
<td>Total</td>
<td>549</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

**Figure 3 – User significations evoked by the respondents**

We will test in our experiment whether the “signification-conscientious” respondents have different answering patterns to the others and especially whether the quality of their responses is as high as we could presume.

3. THE QUALITY OF THE RESPONSES WITHIN A WEB-BASED SURVEY: AN EXTENDED DEFINITION

The concept of “quality of responses” needs to be discussed and enlarged, probably because it has been studied in a very restricted way in survey methodology literature. Response quality has received much less research attention than response rates (Schmidt & al., 2005). Too often, researchers make the confusion between quality of “data” and quality of “responses”. The quality of data is only considered from a methodological point of view, as if collecting the data itself was the ultimate achievement of the survey. When you are running a survey, you do not need only “data” but you need also good-quality responses to the questions you asked.
The most common indicators of responses quality are linked to the non-response error, and the most frequent output that are measured are the non-response and the completion rates. But we think that the notion of quality of responses could be extended with some more “qualitative” criteria that could be helpful for researchers and practitioners, in order to obtain a deeper assessment of the survey output. In a review, apart from response rate or speed, Tuten, Urban & Bosnjak (2002) have identified four dimensions of response quality: item omission, response error, completeness of answer and equivalence of response (between modes of data collection). For Schonlau, Fricker & Elliot (2002), data quality can be judged using several criteria such as unit and item non-responses, completeness of responses (particularly for open-ended questions), honesty of responses and transcription error rate. Then, another main purpose of our article is to suggest an extension of the measurement of the quality of the responses.

3.1. The response rate

Among all the criteria that have been studied as indexes of quality, the response rate is the most frequent. Recently (Kaplowitz, Hadlock & Levine, 2004), it has been confirmed that web surveys can achieve comparable response rates to a questionnaire delivered by “classical” mail. Two important meta-analysis are available to get a complete overview of the factors that could influence response rates within web-based surveys. This research studied respectively 68 (Cook, Heath & Thompson, 2000) and 102 (Lozar Manfreda & Vehovar, 2002) papers. One of their global conclusions is that between all the different characteristics of a study, the number, the persistence and the personalisation of the contacts are the dominant factors affecting response rates in web surveys.

3.2. The “drop-out” rate

The drop-out rate represents the frequency of the respondents who started the survey and finally did not end it. The technological opportunities offered by web surveys allow us to track and to identify those persons who quit the survey, thanks to the log files created by the web-survey server system. Few articles focus on this very interesting indicator of the efficiency of the study process. The drop-out rate can be a substantial problem within some Internet surveys and can reach a frequency of 15-20% (Healey, Macpherson & Kuijten,
Some authors (Knapp & Heidingsfelder, 1999) showed that higher quit rates are produced when using open-ended questions or questions arranged in tables.

### 3.3. The completion rate

Completeness was described as one of the main components of responses quality (Goetz, Tyler & Cook, 1984, Tuten, Urban & Bosnjak, 2002). In prior research, item non-response is frequently used to assess the quality of the data (Schmidt & al., 2005, Roster & al., 2004 for example). This variable can be measured by the number of “no opinions” or “don’t knows” (Frisker & al., 2005). More globally, indicating the proportion of the completed questions of the overall number of the questions in the survey, the completion rate is seldom taken into account as a possible assessment of the quality of the collected data. Cobanoglu, Warde & Moreo (2001) used an index (called “completeness”) to compare the response quality from mail, fax and e-mail surveys. In a research that was relatively similar to ours, Deutskens & al., (2004) established that the number of “don’t knows” and semi-complete answers were slightly higher in a long and visual version of a given questionnaire.

### 3.4. The responses abundance

Taking into account the length of the responses to open-ended questions (Sproull, 1986, MacElroy, Micucki & McDowell, 2002, Ganassali & Moscarola, 2004, Schmidt & al., 2005, Deutskens, deRuyter & Wetzels, 2006) or less frequently the number of items quoted in the multiple-choice questions (Healey, MacPherson & Kuijten, 2005), we are able to evaluate the levels of involvement and consented effort made by the respondent. From an early research, some results suggested that in e-mail surveys, responses for open-ended questions were longer than in traditional mail studies (Sproull, 1986). Some authors even propose to quote (by doing a content analysis) the number of themes evoked in the open-ended responses (Healey, MacPherson & Kuijten, 2005). These new quality indexes (that we call “abundance”) were seldom analysed in the past and we think it can be crucial to incorporate it in our experiment.

### 3.5. The variety of the responses
In the lists of scale questions (very often used in the surveys, such as satisfaction surveys), the respondents sometimes tend to choose more or less the same points and only pick a very narrow range of responses from all the possibilities. This behaviour pattern, which is called “use of sub-scales” or “non-differentiation” has been described in some previous research (Ray & Muller, 2004, Frisker & al., 2005). It shows a lack of interest and a weak level of effort for answering. Variety in the answers would match a high degree of involvement in the survey. This concept was studied in a survey run within an access panel (Göritz, 2004), and also in an experimental comparison of web and telephone surveys (Frisker & al., 2005).

### 3.6. The satisfaction of the respondent

The respondent’s satisfaction could also be a predictor of the questionnaire’s ability to maximise responses quantity and quality. Of course, it has nothing to do with the real quality of the collected data, but we find it could be interesting in our study, to see how quality measures and satisfaction were linked together. As mentioned before, an open-ended question was also asked to the respondent so that the person could justify his/her evaluation. We made a content analysis of the answers to identify the most frequent criteria used as justifications of the questionnaire assessment.

After reviewing the questionnaire characteristics affecting the response patterns and the indexes of responses quality, we came out with a general theoretical framework. Starting from some previous categorisations (Grémy, 1987, DeLamater, 1982, Molenaar, 1982), and using the main factors identified the literature (Couper, Traugott & Lamias, 2001), we can propose a first global framework of the questionnaire characteristics in a web survey, divided into five groups of factors. Grémy (1987) proposed a first categorization including three groups of factors : the responses modalities, the wording of the questions and the questions context (order, instructions and so on). Our framework was built to follow the successive stages of contact between the respondent and the questionnaire itself. First, the person quickly sees the length of the questionnaire (or the number of screens) that represents the level of effort required to answer. Secondly, the respondent will get an impression of the conviviality of the form according to the balance between texts and illustrations. The third step would be the reading of the questions themselves and the assessment of the wording. Then the respondent is supposed to apprehend the interactive components of the survey-interview (tailoring) that could be crucial for web-surveys in the absence of an interviewer. Finally, the
person would successively look at the response formats and would know exactly what kind of task and what kind of data is expected: ticks, numbers, texts, etc.

### Figure 4 – Conceptual framework of the impact of questionnaire features on the quality of responses

<table>
<thead>
<tr>
<th>RESPONSE PROCESS STAGES</th>
<th>QUESTIONNAIRES FEATURES</th>
<th>SURVEY CONTEXT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Comprehension</td>
<td>- General structure of the questionnaire, number of questions or number of screens, progression = first perception of the required effort</td>
<td>- Topic of the survey</td>
</tr>
<tr>
<td>Meaning</td>
<td>- Intensity of illustration, purely text form, illustrative pictures added to the text, pictures involved in the question, picture as response modality = conviviality of the task</td>
<td></td>
</tr>
<tr>
<td>Random</td>
<td>- Complexity of the question wording, sentence length, readability, objectivity, number of verbs, language level... = clearness of the message</td>
<td></td>
</tr>
<tr>
<td>Judgment, response</td>
<td>- Intensity of interaction: repetition of previous answers, questions explicitly based on previous answers, conditional instructions or help = tailoring</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Response formats and type of data expected as answers: ticks or numbers or texts = second perception of the required effort</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>QUALITY OF RESPONSES</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Response rate</td>
</tr>
<tr>
<td>- Drop-out rate</td>
</tr>
<tr>
<td>- Completion rate</td>
</tr>
<tr>
<td>- Response abundance</td>
</tr>
<tr>
<td>- Variety of responses</td>
</tr>
<tr>
<td>- Satisfaction of the respondent</td>
</tr>
</tbody>
</table>

4. **Methodology of our research: Eight versions of the same questionnaire to test the effects on responses quality**

On the basis of the factors that we chose as major characteristics of the questionnaire design, we created **8 versions of a questionnaire related to young people’s consumption patterns**. We did not design a complete experimentation because it was quite demanding and most of all, we feared to have too few answers for each version. For this reason, we first selected only two levels for each factor in order to simplify the experiment.
The links to those 8 on-line questionnaires (see table 2) were sent in November 2005 to a target of **11,200 young people** composed of students of the University of Savoie and external private contacts (friends and relatives) given by the students involved in this project.

Two weeks after launching the survey, we had received 1,935 answers, representing a **global response rate of 17.28 %**. One single follow-up was sent right after the majority of respondents reacted to the initial e-mailing and it helped in maximising the response rate (Dillman, 2000). No real incentive was used but within the text of the e-mail, we insisted on the fact that this survey was part of an important educational and research project and we presume that it had a very strong positive impact on the participation in the survey.

### 4.1. Implementation of the questionnaire variables

- **Length**: we developed two versions of the questionnaire, the short one had 20 questions and the long one had 42 questions.
- **Illustration**: the plain version had no illustration, the illustrated one included 21 photographs
- **Wording**: we wrote a direct-wording version of the questionnaire and another one with a more complex style. To be more objective, we ran the Flesh analysis (available in Microsoft Word®) that indicates an approximate reading grade level. The direct version obtained 60/100 and the sophisticated one 40/100 (0 = very difficult reading, 100 = very easy reading).
- **Interaction**: we designed a first copy without any interaction in it and a second one including some repetitions of previous answers and also conditional appeals: for example if the open-ended question about advertising was not completed, it was presented again with a request for an answer.

As described before, we came up with eight versions of the survey mixing the questionnaire design features as follows:

<table>
<thead>
<tr>
<th>N°</th>
<th>Length</th>
<th>Illustration</th>
<th>Wording</th>
<th>Interaction</th>
<th>URL</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Long</td>
<td>Illustrated</td>
<td>Direct</td>
<td>Interactive</td>
<td><a href="http://ate-j165.univ-savoie.fr/young/young/q1.htm">http://ate-j165.univ-savoie.fr/young/young/q1.htm</a></td>
</tr>
<tr>
<td>2</td>
<td>Short</td>
<td>Illustrated</td>
<td>Direct</td>
<td>Interactive</td>
<td><a href="http://ate-j165.univ-savoie.fr/young/young/q2.htm">http://ate-j165.univ-savoie.fr/young/young/q2.htm</a></td>
</tr>
<tr>
<td>3</td>
<td>Long</td>
<td>Plain</td>
<td>Complex</td>
<td>Interactive</td>
<td><a href="http://ate-j165.univ-savoie.fr/young/young/q3.htm">http://ate-j165.univ-savoie.fr/young/young/q3.htm</a></td>
</tr>
</tbody>
</table>
4.2. Measurement of responses quality indexes

The response rate was easy to compute but additionally we had the opportunity to track the log files on the server with a view to obtaining a measurement of the drop-out rates. We decided not to study the response rate because many contributions are now available on this topic. Some meta-analyses have already demonstrated that the invitation variables (persistence and personalisation of contacts) are probably the most crucial factors.

According to the log files registered on the server, we had a global drop-out rate of 27%. Apart from the frequency of the drop-outs, we found it important to visualise the specific screens where the respondents usually quit. The next figures show that the drop-outs are more frequent (close to 50%) on the second screen of the questionnaires, from both short and long versions.

It would mean that most of the respondents made a quick decision in the first seconds, whether to participate or not in the survey after a quick overview of the two first screens. We can see from the second graph that the drop-outs are not so frequent in the last screens. Then, if the length of the questionnaire has a positive effect on abandon, it is the announced length and its perception more than the “real” length that was endured along the answering process.

Table 2 – The eight versions of the survey questionnaire

<table>
<thead>
<tr>
<th></th>
<th>Short</th>
<th>Illustrated</th>
<th>Complex</th>
<th>Interactive</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Short</td>
<td>Plain</td>
<td>Complex</td>
<td>Linear</td>
</tr>
<tr>
<td>6</td>
<td>Long</td>
<td>Plain</td>
<td>Complex</td>
<td>Linear</td>
</tr>
<tr>
<td>7</td>
<td>Short</td>
<td>Illustrated</td>
<td>Direct</td>
<td>Linear</td>
</tr>
<tr>
<td>8</td>
<td>Long</td>
<td>Plain</td>
<td>Direct</td>
<td>Linear</td>
</tr>
</tbody>
</table>
The completion rate was directly calculated by the software we used to process the examination of the data (Sphinx Survey) but we needed to create some new variables in order to quantify the abundance of the responses: we designed an overall measure of the length of the responses to the open-ended questions, combining all the words obtained in all these questions. We call this new variable a “verbose”. Then the variety of the responses was assessed by the number of different points used as answers within the list of 10 common scale questions. This number is then ranged from 1 to 4. The satisfaction of the respondent was basically measured with a final question where the person was asked to give a mark to the questionnaire, from 0 (very poor) to 10 (excellent).

4.3. Hypotheses

According to this theoretical background, our hypothesis is that Questionnaire n°2 (Short-Illustrated-Direct-Interactive) would obtain the best quality of responses. We think that a
restricted length, a direct wording, an illustrated layout and an interactive survey process would lead to:

- a lower drop-out rate,
- a higher completion rate,
- more abundant responses to open-ended questions,
- more various answers to scale questions,
- a better respondent satisfaction.

Additionally, we except the signification-conscientious respondents to produce better quality answers on the five studied criteria.

5. SUMMARY OF RESULTS

Because the dependant variables are numeric and the independent variables are categorical, and because we decided not to design a complete experimentation, we often used the principal effects analysis of variance to process our analysis with Statistica.

5.1. The influence of length and wording on the drop-out rate

Categorical regression was used to test the effects of 3 variables on the drop-outs. We could not use the “interaction” variable because of technical reasons: the log files were not available with this kind of questionnaire.

<table>
<thead>
<tr>
<th>Effect</th>
<th>-2 log-Likelihood of reduced model</th>
<th>Khi²</th>
<th>df</th>
<th>Signif.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>36.86(a)</td>
<td>0.00</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Length</td>
<td>42.35</td>
<td>5.49</td>
<td>1</td>
<td>0.01*</td>
</tr>
<tr>
<td>Wording</td>
<td>41.99</td>
<td>5.12</td>
<td>1</td>
<td>0.02*</td>
</tr>
<tr>
<td>Illustration</td>
<td>37.89</td>
<td>1.02</td>
<td>1</td>
<td>0.31</td>
</tr>
<tr>
<td>Interaction</td>
<td>Not available</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 4 – Determinants of the drop-out rate
Unsurprisingly, we can see from the next table that you can reach a high drop-out rate of 34% with a long and complex questionnaire, whereas a short and direct version would reduce the drop-outs to 21%, which is really a substantial gain.

<table>
<thead>
<tr>
<th>Drop-out rates / Length &amp; wording</th>
<th>Direct</th>
<th>Complex</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Long</td>
<td>26%</td>
<td>34%</td>
<td>29%</td>
</tr>
<tr>
<td>Short</td>
<td>21%</td>
<td>27%</td>
<td>23%</td>
</tr>
<tr>
<td>TOTAL</td>
<td>24%</td>
<td>31%</td>
<td>27%</td>
</tr>
</tbody>
</table>

Table 5 - Effects of length and wording on the drop-out rate

5.2. The impact of interaction on the completion rate

The overall completion rate was very high in our study, reaching an average of 97%. It was not coherent to compare the completion rates from long versus short questionnaires: if only one question was skipped in the short form, the completion rate was 94.7%, if one question was skipped in the long one, it was 97.6%. The rate was “mechanically” dependent of the number of proposed questions. So, we had to neutralise the length characteristic in this set of analyses.

Interactive questionnaires seem to clearly facilitate a high completion rate. We must mention too that the “wording” factor was close to being significant (p=0.08) and that the direct versions would obtain higher completion rates.

<table>
<thead>
<tr>
<th></th>
<th>SC</th>
<th>D of F</th>
<th>MC</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interaction</td>
<td>93.47</td>
<td>1</td>
<td>93.47</td>
<td>3.99</td>
<td>0.04*</td>
</tr>
<tr>
<td>Wording</td>
<td>72.09</td>
<td>1</td>
<td>72.09</td>
<td>3.08</td>
<td>0.08</td>
</tr>
<tr>
<td>Illustration</td>
<td>58.24</td>
<td>1</td>
<td>58.24</td>
<td>2.49</td>
<td>0.11</td>
</tr>
</tbody>
</table>

Table 6 – Determinants of the completion rate

5.3 Influences of length and interaction on the response abundance
From the last table, it is interesting to see that the long and interactive questionnaire obtained the longer textual responses (average length 78 words) while the linear forms produced shorter texts, approximately 60 words, that is 25% less.

5.4. Variety of responses

No one design characteristic seems to have an impact on the variety of responses. Maybe it was too difficult to have high variance because there were only ten common scale questions and only four possible choices in the scale.

5.5. Satisfaction of the respondent
It was surprising to discover that the long questionnaire generates a significantly higher respondent satisfaction than the short one: 6.75 versus 6.10. The other questionnaire components are absolutely not significant.

**5.6. Effects of the user signification components**

To complete our analyses, it is interesting to see that the respondents who mentioned one of the user signification components in their justification of evaluation produced a better quality of answers. On the table hereafter, we can see that both their completion rate and text abundance are significantly higher. It seems that when a respondent gives a signification to his/her action of answering, he/she tends to provide a better quality of responses: that is to say, a higher completion rate and longer texts.

<table>
<thead>
<tr>
<th>User signification evoked</th>
<th>None</th>
<th>Statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Completion rate Mean</td>
<td>98.3</td>
<td>97.3 p=0.1%* ; F=10.5</td>
</tr>
<tr>
<td>Student t</td>
<td>2.2</td>
<td>1.6</td>
</tr>
<tr>
<td>Response abundance Mean</td>
<td>59.8</td>
<td>41.5 p&lt;0.1%* ; F=36.7</td>
</tr>
<tr>
<td>Student t</td>
<td>3.2</td>
<td>3.9</td>
</tr>
<tr>
<td>Variety of responses Mean</td>
<td>3.7</td>
<td>3.7 p=37.9% ; F=0.8</td>
</tr>
<tr>
<td>Student t</td>
<td>0.5</td>
<td>0.5</td>
</tr>
<tr>
<td>Respondent satisfaction Mean</td>
<td>6.5</td>
<td>6.3 p=12.9% ; F=2.3</td>
</tr>
<tr>
<td>Student t</td>
<td>0.9</td>
<td>0.8</td>
</tr>
</tbody>
</table>

Table 11 - User signification and quality of responses

If we look at the detailed results (tables 12 & 13 hereafter), we can see that responses quality is especially high when the respondent is expressing the will to give an opinion, when he/she is perceiving creativity or reflection while answering the questionnaire. This is also possible
when he/she is considering him/herself as an expert in designing questionnaires or in giving answers related to the topic of the survey (consumption, marketing, advertising etc.). To sum up, as expected, response quality is higher when the user has an interpretative scheme in mind.

<table>
<thead>
<tr>
<th>Norms evoked</th>
<th>Non response</th>
<th>Need for rules</th>
<th>Rules/community</th>
<th>Statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Completion Rate</td>
<td>97.8</td>
<td>97.5</td>
<td>98.7</td>
<td>p=50.2% ; F=0.7</td>
</tr>
<tr>
<td>Response abundance</td>
<td>47.5</td>
<td>61.9</td>
<td>90.7</td>
<td>p&lt;0.1%* ; F=16.5</td>
</tr>
</tbody>
</table>

**Table 12 - Norms evoked and quality of responses**

<table>
<thead>
<tr>
<th>Interpretive schemes evoked</th>
<th>Non response</th>
<th>Giving an opinion</th>
<th>Creativity / Thinking</th>
<th>Pleasure</th>
<th>Expertise</th>
<th>Statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Completion Rate</td>
<td>97.4</td>
<td>99.3</td>
<td>98.7</td>
<td>98.5</td>
<td>98.3</td>
<td>p=1.7%* ; F=3.1</td>
</tr>
<tr>
<td>Response abundance</td>
<td>44</td>
<td>72</td>
<td>66.6</td>
<td>57.3</td>
<td>64.6</td>
<td>p&lt;0.1%* ; F=10.6</td>
</tr>
</tbody>
</table>

**Table 13 - Interpretive schemes evoked and quality of responses**

### 5.7. Discussion

<table>
<thead>
<tr>
<th></th>
<th>Short</th>
<th>Illustrated</th>
<th>Direct</th>
<th>Interactive</th>
<th>User signification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drop-out rate</td>
<td>+</td>
<td>+</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Completion rate</td>
<td>-</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td></td>
</tr>
<tr>
<td>Abundance</td>
<td>-</td>
<td>+</td>
<td>+</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Variety</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Satisfaction</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Table 14 - Summary of results**

As we can see in table 14, our hypotheses are only partially confirmed. As a first step, the summary of our results first suggests that a perceived short and direct-style wording of on-line questionnaires could significantly reduce the drop-out rate (from 34% to 21% in our study). Concerning the length of the survey, the respondents had only the possibility to visualise the
total number of screens, because we did not use any POC indicators that was recommended by Dillmann, Tortora & Bowker (1998), that - maybe - could have minimised the drop-outs again.

Apparently, this perception is critical in the very first screens of the questionnaire because the analysis of the log files on the server indicated that drop-outs are notably more frequent on the second screen of the questionnaires (50%), from both short and long versions. Then, we can say that the decision to quit the survey is influenced by perceived length and by style of wording, on the very first pages of the form.

As a second step, when the respondent is “conquered”, an interactive questionnaire would have very positive effects on the quality of the collected data. Interaction in the survey process would generate a higher completion rate and richer responses (defined in our research by longer answers to open-ended questions). In this experiment, the illustration of the questionnaire had no impact on the quality of the collected data. We have to mention that the pictures we used were only simple “illustrations” of the questions. They were neither response modalities nor illustrations of the response proposals, as mentioned and tested in some past research (Ganassali & Moscarola, 2004). It means that the pictures were used at the lower level of illustration. More research is needed to test the impact of the other types of illustrations that can be implemented in a web-based survey.

Finally, for these motivated and involved respondents, the length of the survey does not seem to be an obstacle any longer. In contrast, our results suggest that they may produce more abundant responses within a long survey and may feel significantly more satisfied in the end.

Another interesting and complementary argument is the relationship between the expressed user signification and responses quality. Apparently, when a respondent is giving a sense to the task, he or she produces higher quality responses, especially if the person feels pleasure, creativity or reflection in giving an opinion.

We are back to the “compliance with requests” approach (Groves, Cialdini & Couper, 1992) and the principles that influence the decision to perform a requested activity, such as the active participation in a survey. From a practical point of view, in the invitation to participate (usually an e-mail) and all the way through the questionnaire itself, it could be useful to
appropriately involve the respondent in the answering task: insisting on the opportunity to give an opinion, to experience an interesting reflection exercise or basically to help the survey administrators, in running the study for example. We are convinced that a better involvement in the task and a better consciousness on the survey process should affect the global quality of the responses.

6. LIMITS AND IMPLICATIONS FOR FUTURE RESEARCH

A few limits exist in our research. From a theoretical point of view, basically, we believe that one of the most important determinants of responses quality in web surveys is the contacting procedure. It would have been very interesting to analyse how invitation aspects would combine with the tested questionnaire features, in a more global theoretical model.

As far as methodology is concerned, first of all, we were not able to run a more complete experimentation plan, that could have been useful for a richer analysis and also to study interaction effects between the independent variables. Secondly, the questionnaire characteristics had only two levels. It is probably not enough to study for instance how the length of the questionnaire could precisely affect the drop outs. We could expect the relationships between the questionnaire features and the data quality indexes to be non-linear but this could be studied with at least three or four levels for each independent variable. But of course, these two last improvements would have resulted in a very complex and heavy experimentation plan, with too many different versions of the on-line questionnaire.

For the same reasons, it was not feasible to test all the questionnaire design characteristics that came out of our literature review. Above all, we regret that the questionnaire’s general structure (logic and progression) was not taken into account in our experiment. It is seldom studied in the literature but we discovered that it was quite frequently pointed out by the respondents as a justification of their evaluation of the questionnaire.

The second methodological limit would be the typicality of the sample that we used for the research. It is only composed of young people from 16 to 25, which could represent a major restriction for the generalisation of the results we observed.

As a conclusion, apart from the operational improvement of the concept of quality of responses, we think that the two most promising results of our study are first the influence of
interaction and secondly the impact of user signification dimensions on responses quality. For web surveys, it is obvious that the interactive possibilities need to be more deeply analysed. In our experiment, we only tested a small part of the available technical options. Missing data messages, on-line help for respondents, confirmation and validation of the previous answers are new technical possibilities offered by the on-line survey process that could be implemented in order to test their potential impact on responses quality.

Finally, aside from the “technical” features of the questionnaire, we believe that the way the respondent involves himself or herself in the survey (user signification), has a crucial effect on the effort made to seriously and completely fill in the questionnaire. The first results to come out of our experiment show that the respondents who have a clear significance of their action while they are answering the questionnaire, produce less item non-responses and longer texts for open-ended questions. It would be helpful to investigate the different dimensions of user signification on a more representative sample to see whether these respondent characteristics would play an important part in the answering process. It would be also important to know whether it is possible to reveal or to increase the user signification with the invitation to participate or with some messages on the questionnaire’s pages.

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