

Impact of Audio Tools in Web Surveys

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Abstract: The use of multimedia tools provides web surveys with a lot of important advantages (interaction with respondents, less response burden, ...), but it also engenders new challenges. Research is currently focusing on various issues connected with the use of multimedia tools, and on its consequences on survey results, in terms of quality of collected data, response rate, and so on. An interesting aspect of multimedia tools is represented by audio devices. This paper, starting from an experimental survey project undertaken using a population of University students, aims at evaluating the impact of the use of audio tools in web surveys, in terms of both quality of collected data and encouraging the respondents' participation. Moreover this work seeks to evaluate the efficacy of audio stimuli, comparing audio and written approaches.

Key words: web surveys, audio tools, online questionnaire, data quality, response rate, randomized experiment.

1 Introduction

The use of multimedia tools (pictures, graphics, pre-recorded voices, videos, and so on) provides web surveys with a lot of potential advantages, if compared with traditional text-based web surveys. With the use of multimedia tools, it is possible to stimulate the interaction of respondents, to control the response burden, to encourage the straightforwardness of respondents, and, in general, to improve the quality of collected data (see Couper *et al.*, 1998 and Conrad *et al.*, 2003). Moreover, recently traditional survey modes have begun merging with the development of mobile web surveys, with surveys implemented using video telephony facilities, and with the use of live or pre-recorded videos (Fuchs and Funke, 2007). Therefore, understanding how and whether

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different modes affect survey participation and the quality of results is a crucial research point. Deeper studies are needed. These new survey tools give rise to new challenges, as well as stimulating an increasing use of them. Currently, the literature is focusing on the consequences of the use of multimedia tools on the results of the survey, mainly in terms of quality of collected data, response rate, social desirability, and so on. An interesting aspect of multimedia tools is represented by the use of audio devices (see Couper *et al.*, 2004).

Our paper aims at evaluating the impact of the use of audio tools in web surveys. In our experiment we use audio devices in proposing both the introduction page and the questions. Starting from an experimental randomized study, based on a population of University students, this work evaluates how much audio tools encourage the participation of respondents, or if it can be rather considered an obstacle in the response process. Moreover, this project has the aim of discovering whether audio tools can be useful in improving the quality of collected data. In particular, the efficacy of an audio version of the questionnaire is studied, comparing the quality of collected data when questions and instructions are read by an artificial voice as opposed to being presented in a text-based web page. In particular, we evaluate the percentage of correct number of choices made by the respondents.

2 Experiment Design

Our project is based on a survey on the use of spare time and consumer behaviour. These themes should limit problems of social desirability, and they should be interesting enough to encourage a wide participation. The survey is based on a questionnaire made up of 12 items administered through a web questionnaire.

The main objective of this experiment is to compare a text-based web survey (we call this the *T-Web* approach) with an audio-enhanced web survey (which we define the *A-Web*). The *A-Web* is an electronic self-administered questionnaire that includes audio of a pre-recorded interviewer reading the questions (previous studies were similarly focused on *audio CASI*, also defined *A-CASI*, see Turner *et al.*, 1998).

For our purposes, two versions of the same questionnaire were developed. The initial part of the first version has a text-based introduction followed by text-based questions. The second version starts with a pre-recorded human voice¹ introducing the survey and reading the questions to the respondents. Halfway through the survey both versions of the questionnaire shift to the opposite mode. The first version (*T-Web* + *A-Web*) switches, after the initial text-based part, to the audio-enhanced questions. The second version (*A-Web* + *T-Web*), after the audio introduction and questions read by an artificial voice, shifts to traditional text-based developed items. This structure of the two versions of the questionnaire allows us to evaluate the effect on potential respondents of a text-based, rather than an audio-enhanced, introductory message. Secondly, switching the *T-Web* questionnaire to an *A-Web* version (and vice-versa), we can evaluate the impact of switching mode in web surveys during the response process.

¹ The human voice was digitally synthesized. This was made to avoid the presence of a known voice influencing the behavior of the respondent both in deciding to participate in the survey and in answering questions.

Furthermore, we evaluate the efficacy of written versus audio questions and instructions by comparing the time spent by the respondent in answering each question and the number of responder's choices when answering certain items.

The target population surveyed consists of students enrolled at the University of Bergamo who attended the course of Advanced Business Statistics during 2011 (the course took place from January to July for students in the fourth year). The students were randomly assigned to the two experimental groups: the first group had access to the *T-Web + A-Web* version of the questionnaire, while the *A-Web + T-Web* version was administered to the second group. The first email was sent on December 13th 2011 to the whole group (113 students). The email was sent about six month after the end of the course to avoid the students being influenced by upcoming exams and/or by the evaluation obtained. The invitation email was initially sent to private addresses (provided by the students during the course). When, for different reasons, there were problems in sending the message (12 students), the official address (assigned to the students on enrolment) was used. All problems were solved using the official email address. Three reminders were sent to non-respondents. The first email and the reminders contained the link to the online questionnaire, the ID and the password used to gain access to the survey. 56 students (49.6%) were redirected to the *T-Web + A-Web* questionnaire, and 57 (50.4%) to the *A-Web + T-Web* version. No incentive was offered and we obtained a response rate of 32.7%: 56.8% completed the *T-Web + A-Web* questionnaire and 43.2% completed the *A-Web + T-Web* version.

3 Preliminary results and conclusions

The analysis of preliminary data shows interesting findings. The impact of question version and of its change can be evaluated by measuring the dropout rate of respondents when a questionnaire is switched from audio to text and vice versa. When a text questionnaire changes to an audio one, some respondents (42.9%) were not able to hear the audio test question. These respondents were redirected to the full *T-Web* questionnaire. This means that technology problems can still be a factor discouraging and/or restraining somebody from participating in the survey, if an alternative is not available. The remaining part of the respondents (57.1%) were able to hear the audio message, so they switched to the audio version. In both the cases, no single respondent ended participation following the audio test question. Moreover, none of the respondents dropped out the questionnaire before its end: the shortness of the questionnaire was probably extremely helpful in gaining this result. All considered, it seems the willingness of respondents to participate in the survey is not affected by technological problems that arise if an immediate alternative solution is offered. This means that great attention should be paid to designing and developing online questionnaires with reference to potential technology constraints; the presence of an alternative way to progress through the questionnaire could avoid possible dropouts.

These results are confirmed by the *A-Web + T-Web* questionnaire. 62.5% of potential respondents completed the audio version, while 37.5% of them were redirected to the full- *T-Web* version, because they were unable to hear the test audio message. However, when the first category of respondents shifts from the *A-Web* to the *T-Web* version, no interruption in participation is observed.

Given this, the change from audio to text-based questions and, most of all, the change from text to audio questions, does not seem to penalize the response rate and the completion of the whole questionnaire. Nevertheless, it has to be taken into account that problems pertaining the use of audio implementation of a questionnaire are quite extensive. In our experiment 40.5% of all respondents had problems in hearing the test audio questions. Probably, many problems are simply related to audio settings (audio switched off, no headphones, low level of audio devices, ...). In any case, the use of the *A-Web* approach, in general, must deal with this possibility.

Other interesting findings are related to data quality. In our analysis we considered errors in the process of filling out the questionnaire as a measure of the relative efficacy of the text-based versus the audio versions. An error occurs when the respondent selects a number of response options higher than the maximum suggested by the instructions following certain questions. We observe a slightly higher efficacy of the audio advices: errors occurring with the audio version are 5.6% of the total answers received, compared to 5.9% obtained with the text-based questions. This is quite surprising: we expected to obtain a higher number of errors in the audio-version, since the audio instructions are heard only at the end of the message, while the text instructions are written, even if in a smaller size, directly under the question. Probably respondents pay more attention to the audio instructions than to instructions written on the web page. We can also presume that most participants in an *A-Web* questionnaire hear the whole message, while the respondents who are completing a *T-Web* version can avoid reading the instructions or may attribute less importance to them.

To sum up, the use of audio devices is not perceived as an obstacle by participants, apart from the technology constraints it creates. Audio tools can rather be helpful in reducing both error in completing the questionnaire and the net participation time (as well as the response burden), and in collecting higher quality results.

In this paper, the preliminary results of the first test of our experimental study were briefly discussed. We are implementing more extended data collection in our experimental design in order to achieve more robust conclusions. We are currently planning a second wave of this survey that will involve a larger number of respondents. Moreover we aim at involving a wider target population, including students in other countries, as well as alternative segments of the general population.

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