Open-Ended Questions (Version 2.0)

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Erstveröffentlichung / Primary Publication
Arbeitspapier / working paper

Zur Verfügung gestellt in Kooperation mit / provided in cooperation with:
GESIS - Leibniz-Institut für Sozialwissenschaften

Empfohlene Zitierung / Suggested Citation:
Züll, C. (2016). *Open-Ended Questions (Version 2.0).* (GESIS Survey Guidelines). Mannheim: GESIS - Leibniz-Institut für Sozialwissenschaften. https://doi.org/10.15465/gesis-sg_en_002

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GESIS Survey Guidelines

Open-Ended Questions

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December 2016, Version 2.0

Abstract

This contribution addresses two aspects of open-ended survey questions. First, I deal with the inclusion of open-ended questions in surveys: When are they useful, and what purpose do they serve? Who answers such questions? And what should be taken into account when designing them? Second, I outline possible methods of analysing responses to open-ended questions. They include content analysis, which has a long tradition in the analysis of responses to open-ended questions. Computer-assisted, dictionary-based content analysis also plays a major role in this regard. It is especially suitable for analysing responses to open-ended questions because they are, as a rule, short and limited by the context of the question. Co-occurrence analysis, which can provide an overall view of the responses, is a relatively new, additional method of analysing answers to open-ended questions.

Citation

Züll, C. (2016). Open-Ended Questions. *GESIS Survey Guidelines*. Mannheim, Germany: GESIS – Leibniz Institute for the Social Sciences. doi: 10.15465/gesis-sg_en_002

1. What are open-ended questions and where are they applied?

All survey questions that do not include a set of response options are known as open-ended questions. Open-ended questions require respondents to formulate a response in their own words and to express it verbally or in writing. Respondents are not steered in a particular direction by predefined response categories.

Depending on the survey mode, either the question is read out and the answer is recorded by the interviewer (face-to-face or telephone interviews) or the question appears on the computer screen/on paper, and the respondent enters the answer into the text field provided (web or postal surveys). In the first case, it is important that interviewers be given clear instructions as to what should be recorded – that is, whether the respondent's answer should be transcribed exactly and in full or whether only keywords should be recorded. In the second case, the respondent enters the answer him- or herself, and its length can be limited by the format of the text field.

Open-ended questions may request textual information (e.g., "Can you tell me what you associate with the term 'right'?") or numerical information (e.g., "How many minutes per week do you do sport?"). Because numerical information differs from textual information in terms of its function and the cognitive response process involved, the present contribution focuses only on aspects of the collection and analysis of textual responses to open-ended questions.

Figure 1 provides an example of an open-ended question taken from the German General Social Survey (ALLBUS 2008; face-to-face interview, http://www.gesis.org/allbus).

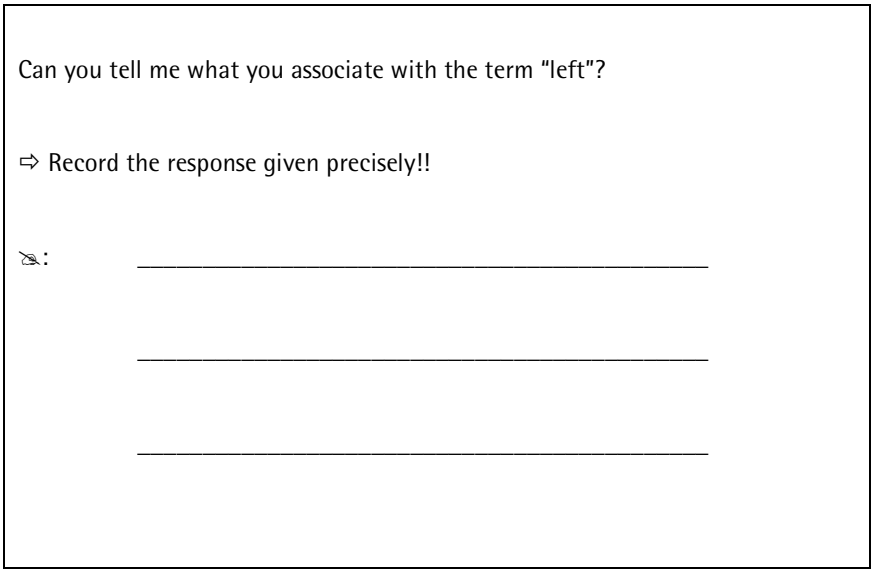

Figure 1: Extract from the ALLBUS 2008 questionnaire

When developing a questionnaire, researchers are often faced with the problem of whether or not to include open-ended questions. There is no generally applicable rule as far as this is concerned. Whether an open-ended question is appropriate depends on a number of different framework conditions. A decision for or against the inclusion of open-ended questions in a survey should not be influenced by

personal preferences for, or aversions to, this type of question, or by the effort involved in the subsequent analysis. Rather, it should depend on the research question and the current state of research.

Open-ended questions can be employed both to gather information and to motivate respondents (Porst, 2011). They are used for information-gathering purposes in the following cases:

- Knowledge measurement

  Open-ended questions are more suitable than closed-ended questions for measuring knowledge, because they not only minimise the likelihood that respondents will try to guess the right answer but also often yield more reliable and valid information. However, when respondents cannot immediately recall the correct answer, open-ended questions also elicit more "don't know" responses or refusals than closed questions do (see Krosnick & Presser, 2010).

- Unknown range of possible answers

  The use of open-ended questions is recommended if it is not yet possible to clearly delimit the subject of inquiry, or if one expects new topics to emerge. An example of this is a question fielded in ALLBUS 2008 about respondents' associations with the terms *left* and *right* (Figure 1). Although it is known from many surveys what respondents associated with the political dimensions *left* and *right* at the time the respective surveys were conducted (see Fuchs & Klingemann, 1990), it must be assumed that people's image of *left* and *right* has changed over time and that these terms may now be associated with other dimensions/topics than they were 20 years ago. To determine whether this is the case, an open-ended question could be asked.

- Avoidance of excessively long lists of response options

  A further field of application for open-ended questions is when the number of possible answers is so long that the question cannot be asked with predefined response categories. An example of this is the occupation question. Although researchers know what occupations there are, respondents cannot, of course, be presented with a list of several hundred response options.

- Avoidance of directive questions

  Open-ended questions can be used to avoid steering respondents in a particular direction. Porst (2011, p. 67) cited as an example the question "Who, in your view, is the best rock band of all time?" Response categories comprised a selection of the best-known bands and reflected only the researcher's own ideas. Such a selection would steer respondents in a certain direction, and there would be a danger that the categories would be chosen not because they reflected the respondents' true preferences or opinions but because they were the only options provided.

- Cognitive pretesting

  Open-ended questions are frequently employed in cognitive pretests to determine why a certain scale value was chosen or to check whether the meaning of a question was understood as intended (see also the *GESIS Survey Guidelines* contribution "Cognitive Pretesting"; Lenzner, Neuert, & Otto, 2016).

In addition to employing open-ended questions for information-gathering purposes, they can also be used to motivate respondents by giving them an opportunity – in between the many closed-ended questions with predefined response categories – to express their opinions freely and in their own words. Moreover, in order to give respondents an opportunity to express criticism or make comments, the following open-ended question is often asked on the last page of the questionnaire: "Is there anything else that you would like to say about our survey?" (see Porst, 2011, p. 157).

2. What should be taken into account when designing open-ended questions?

2.1 Who answers open-ended questions?

Answering open-ended questions places a greater burden on the respondent than does selecting a response category in closed-ended questions. The answer must be formulated in the respondent's own words, which requires not only a willingness to answer but also the ability to freely articulate the response. Various researchers have investigated which respondents are even capable of answering open-ended questions. They found that, as a rule, all respondents are capable of answering this type of question (Geer, 1988). A major role in answering open-ended questions is played by respondents' level of interest in the topic of the question and by the relevance of the topic for them (see Geer, 1991; Groves, Presser, & Dipko, 2004; Holland & Christian, 2009).

Other studies (e.g., employee surveys) have shown that dissatisfied respondents are more likely than satisfied respondents to answer, and to give longer answers, because dissatisfied respondents are often more interested in expressing their dissatisfaction than are satisfied respondents (Andrews, 2005; Borg & Zuell, 2012; Poncheri, Lindberg, Foster Thompson, & Surface, 2008).

2.2 How should open-ended questions be designed?

2.2.1 Clarity of the question and expected length of the answer

Schuman and Presser (1981) reported an experiment in which either an open-ended or a closed-ended question on one and the same topic was administered to different subsamples. The content of the responses elicited by the two question formats was very different, which led the authors to recommend "… that open-ended questions, lacking the additional cues of fixed alternatives, may need to be more clearly focused than closed questions" (Schuman & Presser, 1981, p. 105). In other words, in the case of an open-ended question, respondents must understand very clearly what is expected of them.

When open-ended questions are included in a survey, care should always be taken to avoid addressing more than one topic per question. If the aim is to ask about both positive and negative aspects of a topic or about topics that are, or are not, of importance to the respondent, it is better to ask two questions in each case in order to ensure that respondents address both positive and negative aspects or important and unimportant topics.

Not only the substantive scope of possible responses but also the length of the answers should be clear to the respondents. It is therefore recommended that respondents should always be told what type of response they are expected to give (e.g., only keywords, one item of information, several items of information/a list, a small essay, etc.).

Some studies have shown that the size of the answer box provided in self-administered questionnaires correlates positively with the length and detail of the responses (see Dillman, Smyth, & Christian, 2009, pp. 115-116). In the case of web surveys, for example, it is recommended that (a) the answer boxes should be adapted to the expected length of the answer or (b) text fields should be used that can be enlarged by scrolling (Emde & Fuchs, 2012).

2.2.2 Motivation

Dillman et al. (2009) offered a number of recommendations for increasing respondents' motivation to answer open-ended questions. According to the authors, open-ended questions should be used sparingly to avoid overburdening respondents. Moreover, the importance of the information for the

researcher and his or her work should be emphasised because this appears to have a motivation-enhancing effect.

2.2.3 Question design and survey mode

In the case of open-ended questions asked during face-to-face interviews, an important role is played by the interviewer. By providing additional information and asking follow-up questions, interviewers can help respondents and motivate them to provide better and more comprehensive answers (Dillman & Christian, 2005). However, interviewers are also responsible for recording the responses – that is, they must enter the respondents' utterances into the questionnaire (as completely and faithfully as possible).

In postal and web surveys, on the other hand, the questionnaire designer plays an important role because, in this case, the respondents independently enter the responses to the questions without further support. By providing motivation texts and designing the answer boxes appropriately, respondents can be motivated to give more detailed answers (see, e.g., Smyth et al., 2009; Emde & Fuchs, 2012; Züll, Menold, & Körber 2014).

3. How can open-ended questions be coded/analysed?

3.1 Quantitative content analysis

Quantitative content analysis is the classical method of analysing responses to open-ended questions. One or more coders code the open responses on the basis of a predefined categorisation scheme. The procedure can be outlined only in brief here. However, a detailed description can be found in Früh (2011). Quantitative content analysis consists of the following steps:

- Development of a categorisation scheme: Content analysis aimed at coding responses to open-ended questions always begins with the development of a categorisation scheme that describes the relevant coding categories. These categories can be derived from theory or directly from the textual data. As a rule, both sources are used when developing a scheme. Take, for example, the open-ended question "Can you tell me what you associate with the term 'left'?" Here, one could conceivably use, first, the ideology-related categories employed by Fuchs and Klingemann (1990) – for example, *communism*, *socialism*, *SPD*, and *CDU* (theory-driven category development).

  Then, further categories are defined on the basis of the data (empirically driven approach). This involves examining a sample of the text and deriving categories on the basis of this examination (e.g., *social equality*, *social market economy*, and other topical issues).

  Each category in the categorisation scheme is assigned a label and a category number, followed by a category definition and examples. If necessary, the category is delineated from other categories by means of coding instructions. Anchor examples are a useful way of clarifying the categories. Anchor examples are text fragments that illustrate the meaning of the category particularly well. An example of such a category description can be found in Züll, Scholz, and Schmitt (2010). The authors provide a description of the complete categorisation scheme for coding open-ended questions about respondents' associations with the terms *left* and *right*.

- Coder training: The second step in the content analysis process involves training coders to use the categorisation scheme and pilot testing the categories. Building on this, the scheme can be revised if necessary. This process is continued until satisfactory coding results have been achieved – that is, until an adequate level of intercoder agreement has been reached.

- Coding: In Step 3, all the responses are coded. Coding can be carried out on paper or directly on the computer – for example, in SPSS, in an Excel form, or in special software (e.g., MAXQda, www.maxqda.de).
- Reliability: After coding has been completed, the reliability of the coding should be tested. In Step 4, therefore, a sample of the response texts (depending on the volume of material, e.g., 10% of all open-ended responses) is independently coded by a second coder and a measure of reliability is computed that can be used as an indicator of the quality of the coding. Several measures of reliability are available, for example simple percent agreement, Cohen's kappa, Scott's pi, and Krippendorff's alpha (see, e.g., Freelon, 2010).
- Data management: Finally, the results of the coding (one or several codes per response) are directly added to the other survey data and variables and are jointly analysed with them.

3.2 Computer-assisted content analysis

The coding of responses to open-ended questions can be automated with the help of computer-assisted (dictionary-based) content analysis. This involves coding the responses on the basis of a content-analysis dictionary, which has the same function as the categorisation scheme described above. In this case, the coding rules are formulated as lists of words. Instead of a verbal definition of the categories and the anchor examples, words and phrases are defined that are unequivocal indicators of a particular category. Whenever these words or phrases appear in a response, the corresponding code is assigned. One example of such a dictionary-based category definition is category 1540 (*racism*) in the categorisation scheme on the meaning of *left* and *right* (Züll et al., 2010). Here, the list of words includes, for example, *anti-semitism*, *fight against ethnic minorities*, *racial hatred*, *dark-skinned people*, and *marginalisation of other ethnic groups*. A detailed description of the procedures to be followed when conducting a computer-assisted content analysis of responses to open-ended questions can be found in Züll and Mohler (2001).

In the case of computer-assisted content analyses, the texts must always be available in machine-readable form. For most surveys, this is no longer a problem because they are conducted as CAPI, CATI or web surveys. However, in the case of face-to-face interviews without computer assistance or postal surveys, the effort involved in transcribing the texts must be taken into account.

The results of computer-assisted content analyses are in the same form as those of coder-based content analyses – namely, one or more codes per response, which can be directly added to the other survey data.

As in the case of coder-based content analysis, the quality of the coding in computer-assisted content analysis should also be tested. Here, a sample of the texts is coded by a coder, and the level of agreement between the coder-based and the machine-generated coding is calculated as described above.

The implementation of computer-assisted content analysis calls for suitable software that supports the development of the dictionary and carries out the automatic coding. These software programs include, for example:

- MAXDictio, an add-on module of MAXQDA (www.maxqda.de)
- TextQuest (www.textquest.de/pages/intro.php)
- WORDSTAT (http://provalisresearch.com/products/content-analysis-software/)

The advantage of computer-assisted content analysis is that large volumes of data – either in surveys with very many respondents or in several surveys in which the same question was fielded – can be

coded quickly and reliably. However, the effort involved in the definition and validation of suitable lists of words should not be underestimated.

3.3 Other approaches to coding and analysis

3.3.1 Semi-automatic coding

By now, a number of semi-automated procedures have been developed to improve the coding of texts. They include, for example, "supervised machine learning," an approach proposed by Giorgetti and Sebastiani (2003): On the basis of a manually coded text sample ("a training set of answers") further texts can be automatically coded. The program "learns" from the manually coded texts how particular responses should be coded.

An alternative semi-automated procedure is the structural topic model proposed by Roberts et al. (2014), which is based on a machine learning approach to the analysis of textual data. Information about the respondents, such as their sex, age, or political affiliation, is incorporated into the analysis.

3.3.2 Co-occurrence analysis

Besides the coding of the texts, there are a number of different procedures for directly analysing responses to open-ended questions without assigning one or more codes to each respondent (each individual response). These procedures include co-occurrence analysis, which focuses on words that occur together within a response. This co-occurrence forms the basis of the analysis. The thus generated similarity or distance matrix is further analysed, for example by subjecting it to cluster, correspondence, or multidimensional scaling analysis. Kronberger and Wagner (2002) described at length their approach to analysing open-ended questions. When doing so, they also addressed the related specifications.

Programs such as TLab (www.tlab.it/default.php) and Alceste (http://www.image-zafar.com/Logicieluk.html) are suitable for this type of analysis.

Conceptual mapping, a procedure proposed by Jackson and Trochim (2002), is a similar approach.

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