

# Evaluating responses on fertility intention and uncertainty: the case of open-ended questions

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## Abstract

Fertility intentions recorded in existing surveys have been criticized for their limited predictive ability of fertility behaviors and persistently high level of uncertainty that have long been neglected. This has led researchers to question the effectiveness of fertility intentions measured with current approaches. In this study, we propose a computational linguistic analysis approach with open-ended questions in an experiment of online demographic survey with the Longitudinal Internet Studies for the Social sciences (LISS) panel in the Netherlands, where 464 Dutch women were asked questions on fertility intentions, followed by open-ended ones on qualifying their uncertainty about these intentions. What new insights do the responses to open-ended questions offer? How are responses influenced by ways of presenting the question, and what kind of question prompts more informative answers? And how consistent are they? By evaluating the effect of various options in presenting open-ended questions on response quality and their implication on intentions, we explore practical strategies for incorporating open-ended question in a large-scale demographic survey.

# 1 Introduction

Fertility preferences and intentions are routinely measured by closed questions in many series of large-scale demographic surveys, including the Demographic and Health Surveys (DHS), the British General Household Survey (GHS) and the Generations & Gender Surveys (GGS), which covered Europe and other developed countries. In the current round of the GGS, the following two questions are asked:

- Do you intend to have a/another child during the next three years? (*definitely yes / probably yes / unsure / probably not / definitely not/ don't know*)
- Supposing you do not have a/another child during the next three years, do you intend to have any (more) children at all? (*definitely yes / probably yes / unsure / probably not / definitely not/ don't know*)

Many researchers have attempted to use fertility intentions as a predictive factor for behaviors (Liefbroer 2009; Morgan and Rackin 2010; Freitas and Testa 2017) with limited success, which led to controversy on their utility. People's uncertainty about their intentions may be a reason for this limited predictive ability; already decades ago people reported large uncertainty (Oakley 1981; Morgan 1982), and this has changed little across time (Bhrolcháin and Beaujouan 2011). Despite this, uncertainty has been largely neglected. Bhrolcháin and Beaujouan (2019) discovered that, among demographic articles on fertility intentions/expectations in low fertility countries between 2011 and 2015, only 28% reported frequency information or analytic results relating to uncertain responses. Agadjanian (2005) concluded that fertility intentions reported in surveys are "fraught with ambiguity and uncertainty". As a result, although uncertainty has been provided as an option in surveys, we still know little about their qualitative meaning. To gain meaningful insights into uncertain attitudes, a number of demographers have employed mixed methods and conducted follow-up studies (Schatz and Williams 2012; Staveteig et al. 2017).

This study proposes and tests a new mixed method approach for measuring uncertainty in fertility intentions. We develop multiple versions of open-ended questions and fielded them in a large scale web survey. The ultimate goal of this approach is to get a better understanding of people's uncertainty about fertility intentions, but the aim of the current paper is to examine whether the variation in the wording of the open-ended questions leads to systematic differences in the quality and content of the responses. The responses are evaluated on three metrics: response length (word count), linguistic complexity and inconsistency with the closed question. The implication of each choice in presenting open-ended questions will be discussed based on these metrics.

## 2 Data

Ethical permission for the follow-up study was obtained from the ethical committee of sociology at the University of Groningen (ECS-201123). The data used in this study is collected through LISS (Longitudinal Internet Studies for the Social sciences) panel administered by CentERdata (Tilburg University, The Netherlands). The panel covers a representative sample of Dutch individuals who participate in monthly Internet surveys. For our survey, women between the ages of 18 and 40 were invited and 464 women completed the questionnaire. The survey was conducted in Dutch.

### 2.1 Preparing open-ended questions

According to Bhrolcháin and Beaujouan (2019), uncertainty is the key to unravelling the anomalies and puzzles of fertility intentions, and we still understand very little from closed questions. Therefore, our first open-ended question is:

- **Q1.1** Can you tell us more about what makes you (un)certain about whether or not to have children?

Zaller and Feldman (1992) argued that most people possess opposing considerations on most issues, and answer survey questions based on ideas that happen to be salient at that moment. In the second version of the question, we add a prompt to remind respondents of their choice in the previous question on short-term fertility intention. By providing this reminder, we expect the answers to be more consistent with the closed questions.

- **Q1.2** You answered the previous question "Do you plan to have a child in the next three years?" with [<sup>\*1</sup>]. Can you tell us more about what makes you (un)certain about whether or not to have children?

Follow-up probes are commonly used in self-administered surveys (Groves et al. 2011) and are proved to encourage people to provide longer responses with more themes (Holland and Christian 2009; Oudejans and Christian 2010). As an exploratory experiment, we tested three versions of follow-up probes in this study:

- **Q2.1** Can you mention the three main reasons why you are (un)certain about whether or not to have children?
- **Q2.2** Which specific aspects in your life make you feel (un)certain about whether or not to have children?
- **Q2.3** Can you tell us more about whether you would like (more) children or not?

Each respondent is randomly allocated one of the two versions of first question and one of the three follow-ups.

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<sup>1</sup>definitely yes / probably yes / unsure / probably not / definitely not / don't know

## 2.2 Evaluating responses

### 2.2.1 Response length and linguistics complexity

The quality of responses to open-ended questions is commonly evaluated with quantitative indicators and response length is almost always used (Barth and Schmitz 2021). In addition, we make use of automatic text analysis toolkit T-scan (Pander Maat et al. 2014), a recent innovation in computational linguistics, that offers various variables to represent the linguistic complexity of a response.

Although yet not commonly used in measuring response quality in surveys, linguistic complexity has been widely used in educational studies and information science, and we propose this indicator as a measure that captures linguistic features and adds another perspective of responses.

### 2.2.2 Inconsistency

With comprehensive reading and coding of the responses, we categorize whether the text answers are consistent with the closed questions. For example, while some woman claimed they are definitely having children in the next three years, they also answered that they do not have a partner yet. With these answer coded, we can compare inconsistency in response by different question groups.

## 3 Methods

In our first analysis on response length, to test variance from both the question and the respondent, we plan to use random-effects models or multi-level models (Snijders and Bosker 2011) in this study. At the respondent level, we introduce respondents' educational degree, age, and device used to answer the questions (PC/mobile/tablet). Then, at the question level, the versions of questions allocated are used. This allows us to depict the impact of respondents and questions on response length.

The second analysis focuses on linguistics features retrieved from T-scan. We rank the selected features by the effect size of the differences in that feature across questions, and conduct follow-up regression analyses on selected features from each subcategories (syntactic/semantic/lexical complexity).

The relationship between inconsistency in answers and the type of questions is explored in the third analysis by regressing coded consistency level on allocated questions and stated fertility intentions from the closed question.

## 4 Initial findings

We start by looking at descriptive statistics of the responses, including word count and lexical complexity features. In Figure 1, we show the word count of the responses and visualizes the variations among questions Q1 and Q2.

The Measure of Textual Lexical Diversity (MTLD) was developed by McCarthy (2005) to gauge lexical diversity. It enjoys the advantage of not being

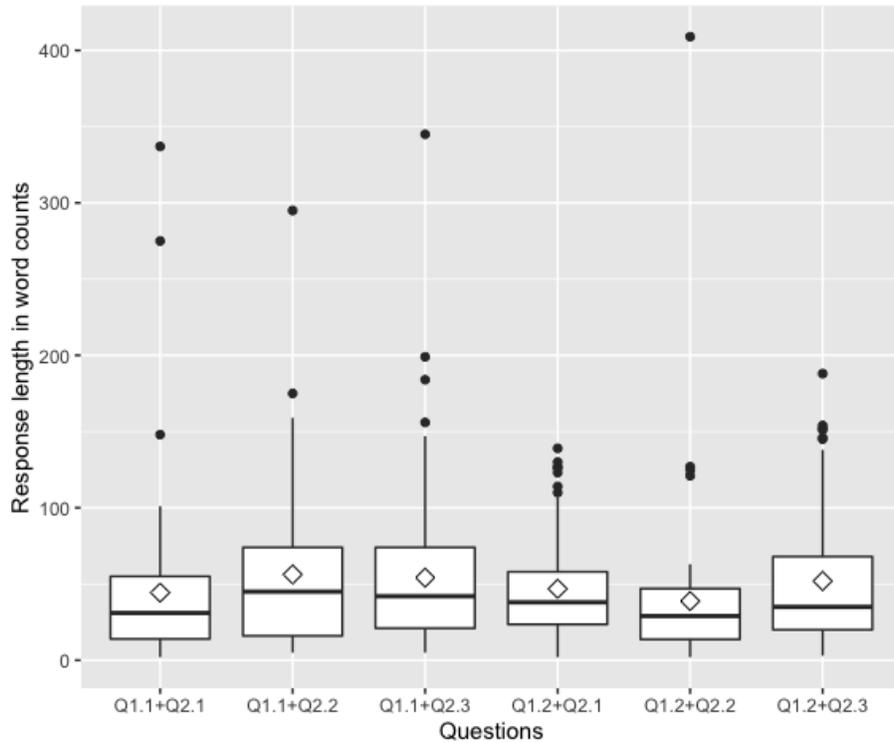


Figure 1: Boxplots of the response length to combinations of open-ended questions on fertility uncertainty

influenced by text length and is advised as a reliable measure (McCarthy and Jarvis 2010). The boxplots of Figure 2 illustrate the variations in lexical diversity across questions.

Beyond the statistics, we briefly read the responses for consistency with preferences stated in closed questions. Although the formal coding process has not started yet, we were able to identify several example of inconsistency. For example, a woman claimed she would "definitely have a child" in the next three years, but went on to describe herself as in very poor health condition and probably would not "get her energy back" for the open-ended questions.

The next steps of this study include extracting and comparing more linguistic features, coding responses on consistency and implementing regression analyses. What effects does versions of Q1 and Q2 make on responses respectively, and how do they influence each other? Would platform of filling the survey also make an impact? How much inconsistency are there in responses, and could we attribute it to variation in questions? These are the issues we aim to tackle in the complete paper.

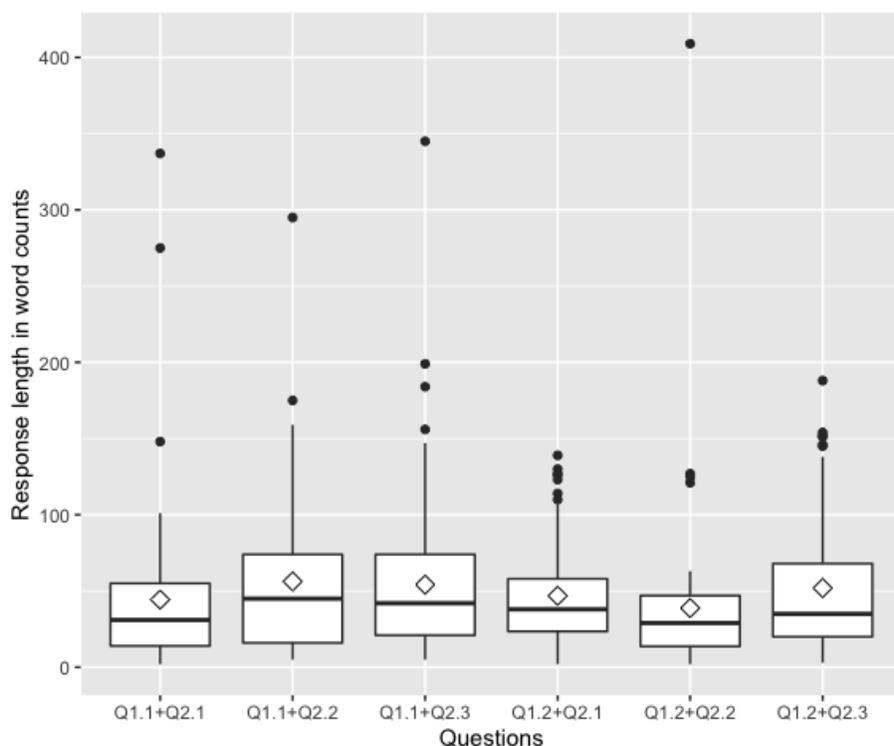


Figure 2: Boxplots of MTLD of the responses to combinations of open-ended questions on fertility uncertainty

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