

# A Review of the Use of Comprehension Questions in Health Preference Studies

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## BACKGROUND

- There is growing interest in incorporating the patient perspective into health care-related decision making.
- Preference elicitation methods for capturing patient preference information, such as discrete choice experiments, use survey-based techniques to present hypothetical health care product (i.e., medication, treatment, or device) profiles comprising a variety of different attributes or features.
  - These surveys can be complex, requiring respondents to read and comprehend detailed information.
- The accuracy and precision of preference estimates depend on maximizing a survey's response efficiency or reducing measurement error due to respondents' inattention or lack of comprehension.<sup>1</sup>
  - Some of the potential sources of increased measurement error in discrete choice experiments may include confusion or misunderstanding or unobserved, heterogeneous interpretation by respondents, resulting from poorly constructed attribute and attribute-level definitions or from respondent inattention.<sup>1</sup>
  - The use of comprehension questions is one potential approach to improve respondent comprehension and/or inattention and reinforce important concepts.

## OBJECTIVE

- The objective of this study was to review selected health preference studies to:
  - Describe how respondent attention and comprehension were assessed using survey questions
  - Evaluate the responses to comprehension questions
  - Determine whether the responses to the comprehension questions were used in analysis of the preference choice questions

## METHODS

- Reviewed data from 25 health preference studies conducted by RTI Health Solutions that used questions to assess respondent comprehension and retention of survey information.
  - **Respondent type:** 19 surveys were conducted with patients, 4 were conducted with caregivers (parents, guardians, and informal caregivers such as spouses or children providing care for patients), and 2 were surveys of the general population.
  - **Question type:** Questions were classified into three categories: attribute comprehension, general information comprehension, and choice question context. (Examples of each question type are provided in Figures 1-3.)

**Table 1. Summary and Description of Question Types Identified**

Question Type	Description
Attribute comprehension	Used to facilitate and reinforce comprehension of information that described the attributes presented in the choice questions
General information comprehension	Provided checks on understanding of information associated with disease-related concepts
Choice question context	Used when understanding the setup of the choice question was critical to answering the choice questions (e.g., the hypothetical profiles were 2 different types of procedures, where understanding the differences would be important for making a choice)

- Questions were classified independently by two separate researchers. Discrepancies and ambiguities were noted and assigned to one of the three categories that provided the closest match to the question type.
  - The percentage of respondents who answered each comprehension question incorrectly was summarized by question type and respondent type.
  - Studies that included the responses to comprehension questions in data analysis (i.e., as covariates in multivariate regressions or to identify subgroups in latent class analysis) were identified.
- ## RESULTS
- Of the 25 health preference studies reviewed, 91 comprehension questions were identified (Table 2).
  - The average number of comprehension questions asked per study was 2.6, with a minimum of 1 and a maximum of 6.
    - The most commonly used question type was attribute comprehension (n = 74).
  - The percentage of incorrect responses ranged from 1% to 69% across the 25 studies (Table 2).
  - Surveys of the general population and patients had the highest average percentage of incorrect responses (28% and 26%, respectively), and surveys of caregivers had the lowest average (19%).
  - Questions designed to assess understanding of the choice question context had the highest percentage of incorrect responses (31%) despite the smallest number of total questions (n = 5).
  - In total, 46% of the surveys used the responses to comprehension questions in the analysis of the preference data, usually to examine subgroup differences.

**Table 2. Percentage Answering Incorrectly by Respondent and Question Type**

Sample	Mean Percentage Answering Incorrectly (SD)	Minimum Percentage Answering Incorrectly	Maximum Percentage Answering Incorrectly
Full sample (n = 91)	24% (15%)	1%	69%
Patients (n = 67)	26% (15%)	1%	64%
Caregivers (n = 20)	19% (16%)	1%	69%
General population (n = 4)	28% (9%)	17%	39%
Attribute comprehension (n = 74)	26% (15%)	1%	69%
General information comprehension (n = 12)	13% (7%)	1%	23%
Choice question context (n = 5)	31% (19%)	10%	57%

## CONCLUSIONS

- Responses to comprehension questions may provide an indication of data quality that can be incorporated into the statistical analysis of preferences.
- Future research could further evaluate how to better frame and write the questions, as well as investigate the effect of incorrect responses on preferences and the correlation between respondent characteristics and comprehension.

**Figure 1. Example of Attribute Comprehension Question**

Based on the information presented in the table below, which treatment has a **higher risk of constipation because of the medicine?**

Medicine A                       Medicine B

Medicine Feature	Medicine A	Medicine B
Risk of nausea and/or vomiting because of the medicine	4 of 100 people (4%)	0 of 100 people (0%)
Risk of constipation because of the medicine	2 of 100 people (2%)	6 of 100 people (6%)

**Figure 2. Example of General Information Comprehension Question**

**This survey is about type 2 diabetes. Please review the information in the box about type 2 diabetes.**

**Important things to remember about type 2 diabetes**

- **Currently, there is no cure**
- **It can be prevented with diet and exercise**
- **It can be reversible or go into remission**
- **People with type 2 diabetes may or may not need insulin**

**Can type 2 diabetes be prevented with diet and exercise?**

Yes                       No

**Figure 3. Example of Choice Question Context Question**

**Please indicate whether each statement below applies to the surgical procedure or the outpatient procedure.**  
**You can review the information again by clicking on Surgical Procedure or Outpatient Procedure.**

	Surgical Procedure	Outpatient Procedure
<b>1. You will need general anesthesia</b>	<input type="checkbox"/>	<input type="checkbox"/>
<b>2. You have to stay overnight after the procedure</b>	<input type="checkbox"/>	<input type="checkbox"/>
<b>3. You will need to have an injection to numb your hand</b>	<input type="checkbox"/>	<input type="checkbox"/>
<b>4. Your activities will be limited for the rest of the day</b>	<input type="checkbox"/>	<input type="checkbox"/>
<b>5. You will be awake for the entire procedure</b>	<input type="checkbox"/>	<input type="checkbox"/>
<b>6. The procedure is successful more than 99% of the time</b>	<input type="checkbox"/>	<input type="checkbox"/>

## DISCUSSION

- This study provides a summary of the types of comprehension questions commonly employed across 25 health preference assessments.
- The findings suggest that less than 50% of the studies used the responses to the comprehension questions in the analysis of the preference data.
- There is little to no research on how to develop comprehension questions or whether using comprehension questions is an appropriate method to evaluate preference data.
- In addition, the reasons for answering the comprehension questions incorrectly and the potential implications are not well understood.
  - Some potential reasons for incorrect responses may include respondents misreading or not paying attention to the question being asked, misinterpreting the question (i.e., thinking that it was asking for an opinion), or that the question was written at a level that was difficult for the respondent to comprehend.
  - Furthermore, patients may do better on general information questions because they have been living with their condition, while attribute comprehension and choice context questions are asking about newly acquired and/or unfamiliar information.

## REFERENCE

1. Johnson FR, Lanscar E, Marshall D, Kilambi V, Muhlbacher A, Regier D, et al. Constructing experimental designs for discrete-choice experiments: report of the ISPOR Conjoint Analysis Experimental Design Good Research Practices Task Force. *Value Health*. 2013;16:3-13.

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