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Words or graphics to present a Discrete Choice Experiment: Does it matter?

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ABSTRACT

Objective: To test whether presenting attribute levels in words or graphics generates different results with respect to attribute level interpretation, relative importance and participation probabilities.
Methods: Parents of 959 newborns completed a DCE questionnaire that contained two versions of the same nine choice tasks in which the attribute levels were presented in words or graphics. Five attributes related to the decision of parents to vaccinate their newborn against rotavirus were included. Mixed-logit models were conducted to estimate the relative importance of the attribute levels.
Results: Respondents who started with the choice tasks in words produced the most consistent answer patterns. All respondents significantly preferred words to graphics. Part-worth utilities and the relative importance of the attribute levels differed based on the words and graphics data, resulting in different probabilities to participate in vaccination.
Conclusions: Words were preferred over graphics, resulted in higher choice consistency, and showed more valid attribute level estimates. Graphics did not improve respondents' understanding of the attribute levels.
Practice implications: Future research on the use of either words or graphics is recommended in order to establish guidelines on how to develop a valid presentation method for attribute levels in the choice tasks of a DCE.

1. Introduction

There is an ongoing discussion about the complexity of choice tasks in health-related Discrete Choice Experiments (DCEs) and the extent to which respondents are capable of completing those choice tasks as intended by researchers [1–4]. At the same time, there has been an increase in the use of DCEs within the public health and health care research setting [5,6]. Those DCEs aim to elicit respondents' preferences in order to advise on the development of preventive programs, medical therapies and/or policy measures [7–9]. Since DCEs are used for policymaking, the accuracy and validity of the measured (i.e., stated) preferences is essential. It is therefore vital that respondents understand the medical and/or health related information that is included, in order to make accurate choices that reflect their true preferences. The validity of a DCE is at risk if respondents do not fully understand how to complete the DCE, because they lack understanding of the attribute levels (i.e., program or health product characteristics such as the level of vaccine effectiveness) within the DCE.

There is great diversity in the way health information is translated into attribute levels are how they are explained to respondents and how choice tasks are presented in DCEs on prevention or health related topics [6]. Some researchers have pointed-out that the use of graphics or icons might help to make choice tasks easier and therefore improve respondents' understanding of the concepts in question [10–12]. Although there is no empirical evidence within the literature to support this assumption, these suggestions probably stem from the large amount of research on improving risk communication to enhance shared and informed decision making as well as self-management [13–23].

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Those studies showed that individuals in general but specifically individuals with a lower educational level and/or health literacy have greater difficulties with risk and health information displayed in words or numbers compared to graphics [13,17,24]. This is of particular importance for DCEs within the public health and health care setting, because individuals with a low educational level and health literacy use public health and/or health care interventions relatively more often [25,26]. Studies investigating the validity of and preferences for communicating health related information showed that the use of icons or graphics might be helpful, if designed properly [13,15,16,18–20,22]. Currently, evidence on the effectiveness of depicting attribute levels using graphics within a DCE context is lacking. Pending such evidence, graphics are used under the assumption that individuals will be able to correctly decipher the actual numerical information captured in the graphics, to interpret the information and to reveal their preferences accordingly.

This study empirically tested whether DCE results with respect to attribute level interpretation, relative importance and participation probabilities differ when either words or graphics are used to present attribute levels in the choice tasks. Specifically, it was tested whether those results differ among respondents with a different educational level and health literacy status.

2. Methods

2.1. Subject of the Discrete Choice Experiment (DCE) and participant recruitment

A DCE on parental preferences for rotavirus vaccination among newborns was used as a case for this study, details and results of this study are described elsewhere [27]. A random sample of 2500 parents of newborn babies aged six weeks was selected from a national vaccination register (Praeventis) to receive the DCE questionnaire [27]. The Institutional Review Board of the University Medical Centre Utrecht concluded that formal testing by a medical ethical committee was not necessary, as parents were only required to complete an anonymous questionnaire once, which is in accordance with the guidelines laid down in the Declaration of Helsinki.

2.2. Attributes, levels and choice task presentation

Attributes and levels were identified based on previously published literature [28–35], interviews with experts (i.e., a pediatrician with specific interest in rotavirus infections and a scientist with specific interest in vaccination behavior), and four group interviews with in total 28 parents of newborns. Five attributes were selected for this DCE (Fig. 1). A professional

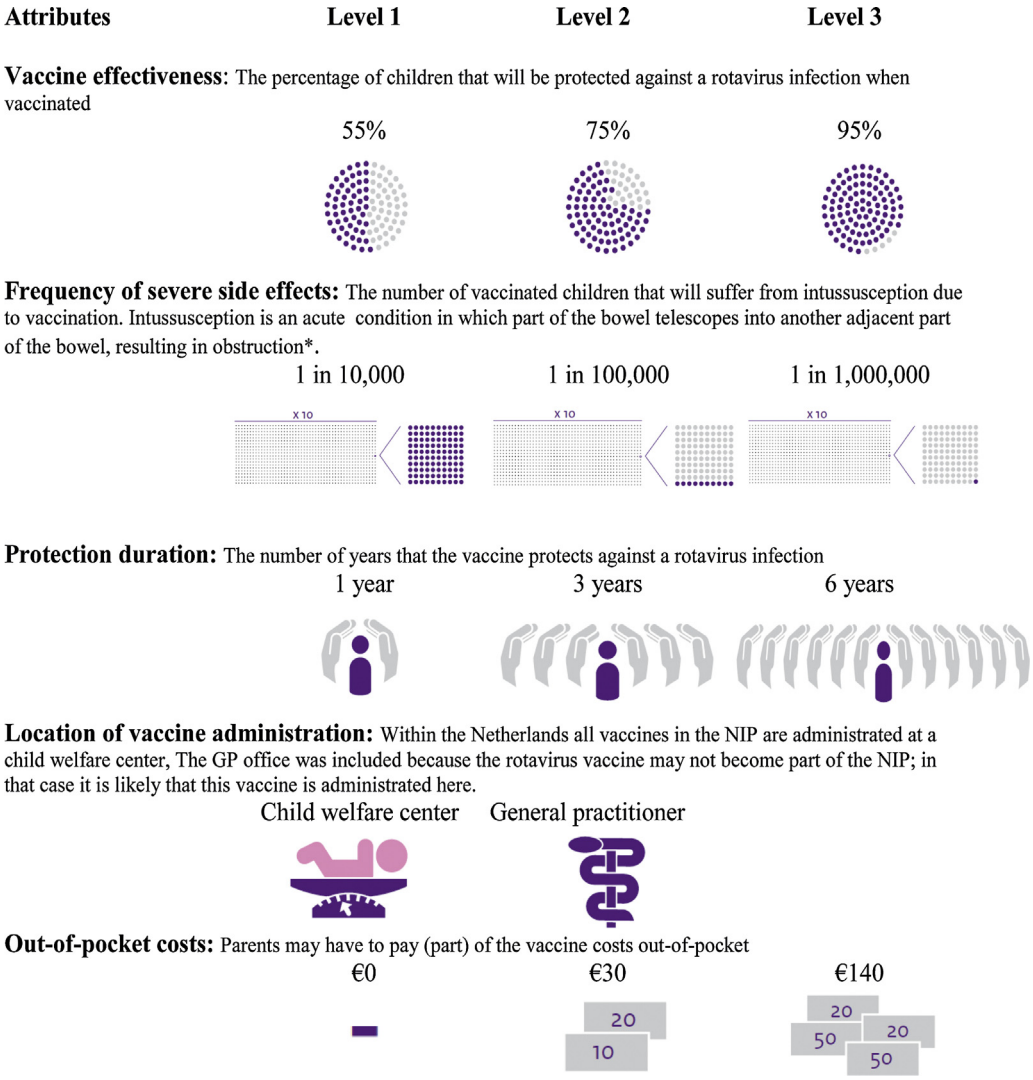

Fig. 1. All attributes in levels as described in the questionnaire in words and graphics.
* See references list (53).