



Surface- and deep-level diversity in panel selection – Exploring diversity effects on response behaviour in foresight



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ABSTRACT

In addition to foresight research endeavours that focus on the application of the Delphi survey technique, numerous research articles have dealt with the method itself: namely improving the Delphi technique's task and process characteristics. Particularly in Policy Delphi surveys and related variations that strive to explore opposing views, the diversity of the Delphi panel has been scrutinised. In the majority of earlier Policy Delphi studies, expertise accounted for the most predominant panel selection criterion. However, further surface- and deep-level diversity dimensions discussed in related social science research need to be incorporated for steering diversity in panel selection. In this article, the main effects of surface- and deep-level panel diversity on response behaviour are examined, focussing on extreme response style (ERS). Moreover, interaction phenomena of diversity variables are considered. By conducting a Policy Delphi in real-time format on the future of multimodal mobility, we demonstrate that value attributes significantly influence extreme response behaviour while expertise is especially important in combination with various other diversity variables. Furthermore, we identified a moderating effect of age on the relationship between environmental value characteristics and Delphi panellists' response behaviour.

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1. Introduction

Futures research has gained importance over the last years: not only for companies, but also for administrative institutions [1,2]. One of the most important futures research methods is the Delphi technique, which has been previously applied in a wide range of fields and constitutes a well-established research method [3–7]. Based on the exchange of knowledge in an anonymous format, the technique facilitates a structured group communication process that enables participants to effectively express individual assessments [8]. According to Webler et al. [9], the Delphi technique should be used in research settings with high uncertainty that require a mixture of scientific

evidence and social values. Hence, the method is one of the most frequently used methods in foresight and proves to be an efficient mechanism to generate structured group discussion of future issues [10,11].

In addition to research endeavours that focus on the application of the Delphi technique, the method itself has been at the heart of numerous research works.¹ Thus, researchers have focused on improving Delphi's task and process characteristics [12–15]. A popular Delphi variant is the Policy Delphi survey and related variations that strive to maximize controversial debates on certain issues and to identify potential resolutions. The objective is not primarily to find consensus among the panellists. Rauch [16] characterised Policy Delphi studies as surveys where panellists should take extreme views

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¹ The special issue on the Delphi method in "Technological Forecasting & Social Change", Volume 78, Issue 9 (2011), documents researchers' unbowed interest in methodological research.

instead of aiming for neutral answers. Extreme views in surveys are known in social sciences as extreme response style (ERS), i.e. “the tendency of respondents to favour or avoid using the endpoints of a rating scale” [17, p. 104].

Until now, Delphi study participants were mainly chosen for their expertise (e.g. [18–20]). However, it has been recently questioned if expertise and, often related to expertise, the organisational background of a Delphi panel candidate should be used as the sole selection criteria for composing heterogeneous panels (e.g. [18]). Such a limited range of selection criteria could limit ERS in Policy Delphi studies.

In related social science research, additional diversity² attributes exist which can be divided into surface-level diversity criteria: such as age, gender, and organisational size; or deep-level diversity criteria: such as value systems, knowledge, and learning curves. These attributes can potentially influence the level of diversity in a survey panel and therefore also panellists' response behaviour [21].

The precise effect of panel membership on opinion diversity, and eventually on Delphi survey response behaviour, has not yet been researched comprehensively. Hussler et al. [18, p. 11] stated that “much remains to be done before there is a definite answer over how the Delphi method might be recast to improve its capacity to account for heterogeneous opinions.” Therefore, empirical investigations need to be conducted in order to compile knowledge of how Delphi panels should be composed. Thereafter, rigorous guidelines can be proposed to ensure panel diversity [13,22,23]. Moreover, researching the combined effects of diversity factors on response behaviour also appears to be relevant. According to Shore et al. [23, p. 119], “studying the effects of variables in isolation is not as fruitful as a more holistic view in which interactions among variables are examined.”

Based on these considerations, we aim to comprehensively examine diversity criteria and their interactions in order to determine common themes across the various dimensions. By incorporating related research from the fields of psychology, human resources, and management science to enhance the Delphi methodology, we explore panellists' response behaviour in foresight. For this purpose, we employ a real-time Delphi approach [24] concerning the future of the socio-technical system of multimodal mobility. We strive to bring what previous researchers, among others Hussler et al. [18], already started one step further and devise recommendations for researchers and practitioners on how to achieve ERS in Policy Delphi studies by a targeted consideration of specific panel member attributes: we first review the Delphi method and discuss the dimensions and methodological measures of heterogeneity. Diversity attributes from related research streams, i.e. surface-level and deep-level diversity factors, are incorporated. In this context, the concept of ERS is introduced. Based on current considerations concerning diversity in Delphi studies, we derive our research hypotheses and elaborate on our research methods. Our analyses will focus on main diversity effects and on how deep- and surface-level diversity dimensions interact. Following the discussion of our findings, we highlight their practical implications.

² We employ the terms “diversity” and “heterogeneity” as synonymous.

2. Theoretical background and research gap

2.1. Delphi method and the importance of expertise

The Delphi method is a survey technique which aims at efficiently structuring the dynamic group communication process. The discussion process of the panellists might conclude in consensus. However, the primary aim of the Delphi technique is not necessarily to achieve consensus, rather its measurement is a valuable element of data interpretation [6,25]. A standard Delphi survey is conducted anonymously, in written quantitative and qualitative form over multiple rounds. After each round, participants receive information concerning the overall group opinion and can adjust their responses accordingly in subsequent rounds [15,26]. Depending on its design and purpose, a Delphi study may either facilitate consensus-building among a group of experts or maximize the controversy and opposing viewpoints inherent in an issue. The latter refers to Policy Delphi studies [27] and related variations, such as “dissensus-based” Delphi studies [28–30].³ Regardless of the type of technique employed, Delphi studies can support problem solving and forecasting activities [8]. There are four distinct characteristics of Delphi studies [15]: anonymity, iteration, controlled feedback, and statistical “group response”. These characteristics make the Delphi technique a highly efficient and methodologically robust survey tool.⁴

Originally, the Delphi method was a technique mainly used to survey experts, as described in various early definitions of the technique, for example [26]: “Delphi is the name of a set of procedures for eliciting and refining the opinions of a group of people. In practice, the procedures would be used with a group of experts or especially knowledgeable individuals” [31, p. 1]. Later definitions were similar: “A method for obtaining independent forecasts from an expert panel over two or more rounds with summaries of the anonymous forecasts (and perhaps reasons for them) provided after each round” [32, p. 776]. Overall, most Delphi studies relied on the opinion of experts in their samples, while not claiming representativeness of a population [18,33]. However, the selection of panellists according to their expertise might involve biases, such as selection bias, in cases where experts are asked to evaluate their expertise themselves [34–37]. Moreover, many panellists fail to participate in subsequent Delphi survey rounds. A high drop-out rate has immediate consequences for the expertise of the Delphi panel: experts may find it difficult to deal with some of the projections and therefore drop out. This can negatively affect the success of the survey by causing an unbalanced population of experts in the Delphi panel [35,38].

Thus, it has recently been discussed if expertise is a sufficient variable to ensure accuracy and overall quality in Delphi surveys. Hussler et al. [18] therefore questioned this practice and called for more diversity in Delphi panels. The inclusion of additional

³ In the course of this paper, the term Policy Delphi includes all similar variations, such as dissensus-based Delphi studies, that strive to maximize controversial debates instead of facilitating consensus-building.

⁴ For further information about the distinct characteristics of the Delphi method, please refer to [26] H.A. von der Gracht, *Future of Logistics*, Gabler, Wiesbaden, 2008.

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