How number and size of text boxes in argument diagrams affect opinions

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ABSTRACT

Argument diagrams are schematic representations of claim-reason complexes, displaying boxes with standpoints and arguments, and lines or arrows to relate these boxes. In four experiments, we investigate the metaphor framing effect by investigating how the perceptual cues size and number of arguments influence evaluations of arguments. In the first experiment, we looked at the effect of size and number of boxes independent of content, using an empty argument diagram. We asked participants to imagine there were arguments in the boxes and decide whether they would choose in favor or against. Participants chose according to hypotheses: the side that had larger boxes, the side that had more boxes, or the side that had both larger and more boxes. In the other experiments, the diagrams contained real standpoints and arguments. Although content was very important in judging arguments, the effect of perceptual cues was still present. We found that mainly the number of arguments influenced decisions, while size painted a more complicated picture. We discuss these results in the light of argumentation and persuasion for learning.

1. Introduction

Imagine that you are a student asked to analyze an argument diagram, showing standpoint and arguments on vaccination in boxes connected by lines (see Fig. 1), to form your own opinion on whether or not you should get vaccinated. You would probably read the arguments in favor and against vaccination drawn from different sources, and base your opinion on how plausible they sound and how (in)effectively they are rebutted. Your own prior knowledge on this issue, your epistemological beliefs, your experiences and thoughts may also play a role in your judgment (Mason & Scirica, 2006; Murphy & Alexander, 2004). However, your opinion may also be influenced by certain perceptual features of the argument diagram, that is, features of the diagrams that are not directly related to content. Consider for example the possibility that the colors and the lay-out play a role in your decision to agree with the claim, simply because the supporting arguments are green, and the lines connecting the boxes actually touch the claim box? If this indeed were to happen, what would be the implication for the use of argument diagrams in discursive contexts? Would it compromise a rational way of processing and assessing argumentative discourses?

In this paper, we report on four studies that address the question of what role perceptual features of argument diagrams play in evaluating claims and arguments. In particular, we focus on the possible effects of the perceptual cues *size* and *number* of boxes in for-against diagrams on people's judgments of claims. A for-against diagram is defined as a visualization of a two-sided argument that lists the arguments in favor on one side and the arguments against on the other side (see Figs. 2 and 4 for examples). These types of diagrams are often used in newspapers or on websites, to give readers an overview of a space of debate (see *The Argument Factory* for an example https://www.argumentenfabriek.nl/media/1985/11144-schaliegaswinning-s.pdf). We investigated the hypotheses (1) that larger boxes are interpreted as more important than smaller boxes, and (2) that more boxes are interpreted as more important than fewer boxes.

Investigating the effect of perceptual cues on how argument diagrams are interpreted is important for learning and instruction for at least two reasons. First, results may inform developers of instructional materials about the uses and effects of non-content perceptual cues in presenting learning materials. Second, diagrams are used in various educational settings to teach students to analyze the structure of argumentation, discuss topics with peers, summarize and structure debates, and take positions on issues. Therefore, students need to be taught about possible influences of perceptual cues.

1.1. Argument diagrams for learning

Argumentation lies at the heart of thinking and reasoning (Kuhn, 1991; Voss & Means, 1991). Teaching people about argumentation is therefore very important in education, especially in our increasingly complex society where many questions have no straightforward answer. The integration of arguments and counterarguments to reach an overall conclusion involves processes important for learning, such as

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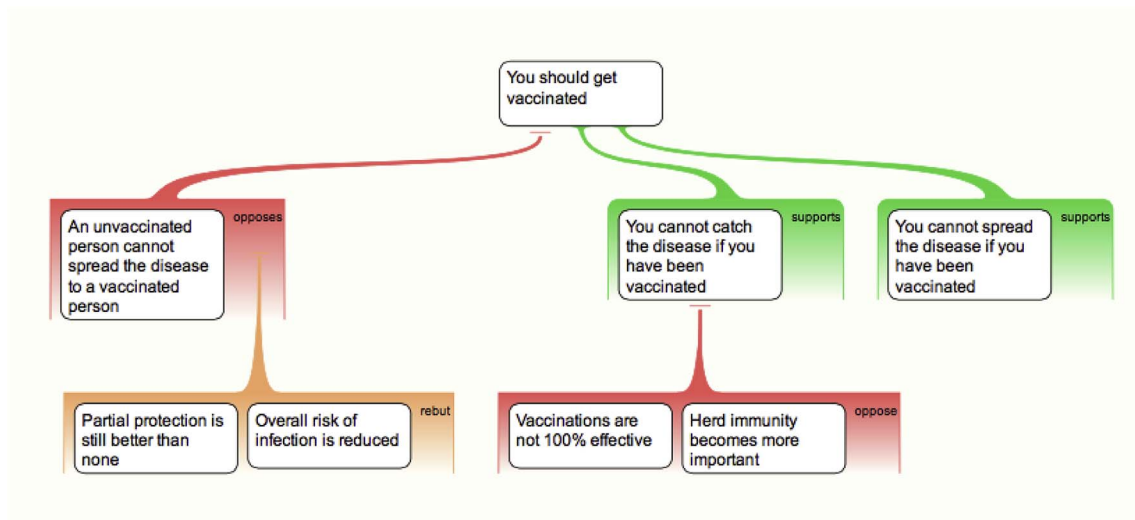
Fig. 1. Argument map created with Rationale™, found on https://oddrops.wordpress.com/2015/09/24/argument-mapping-with-rationale/.

Fig. 2. Examples of types of diagrams in experiment 1 (green and red counterbalanced, item variation in number (1,3,5) and size (small, medium, big) counterbalanced. (For interpretation of the references to color in this figure legend, the reader is referred to the Web version of this article.)