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Understanding of graphs in social science undergraduate students: selection and interpretation of graphs

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How do university students understand the graphs that they read in their textbooks? How does their knowledge regarding the content and their statistical training influence this understanding? Does the kind of task demand also influence this understanding? To answer these questions, we asked a group of psychology students and a group of economics students to choose the most suitable graph for presenting the results of different psychological research studies (reports) (selection task) or to explain in words the results of the same reports shown by means of their graphic representations only (interpretation task). The results showed there were very few differences between groups. Most of the students were able to relate textual information to the adequate graph, but also revealed significant shortcomings and mistakes in their understanding of important syntactic aspects of graphs. They also interpreted the graphs correctly but their interpretation had different levels of complexity, which were not always optimal. We also identified significant differences regarding the difficulty of the reports and the kinds of misinterpretations of graphs. The two tasks thus revealed different pictures of students' skills in reading and interpreting graphs and, consequently, how the characteristics of task demands influence their performance.

Keywords: understanding graphs; influence of knowledge; task demands; graph selection; graph interpretation

Introduction

Reading, understanding and constructing graphical representations are essential competences in daily life as well as in most educational and professional contexts. Graphical representations are some of the most important and helpful tools for social scientists to communicate data, construct theories and perform other important functions. Pre-university and university training should enable students to acquire this competence. Nevertheless, the teaching of graphs is usually restricted to the mathematical or statistical classroom in contexts unrelated to content and problems. A question, then, is how do university students understand the graphs that they read in their textbooks? How do their knowledge regarding content and their statistical training influence this understanding? Does the kind of task demand also influence this

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