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# Understanding the Effectiveness of Computer Graphics for Decision Support: A Cumulative Experimental Approach

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# Understanding the Effectiveness of Computer Graphics for Decision Support: A Cumulative Experimental Approach

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## ABSTRACT

A total of 840 junior and senior-level undergraduate business students participated in three experiments which compared computer-generated graphical forms of data presentation with traditional tabular reports. The first experiment compared tables and bar charts for their effects on readability, interpretation accuracy and decision making. No differences in interpretation accuracy or decision quality were observed for the two groups, although tabular reports were rated as more "easy to read and understand" than graphical reports. The second experiment compared line plots with tables for their effects on interpretation accuracy and decision quality. Subjects with graphical reports outperformed those with tables. There were no meaningful differences in interpretation accuracy across treatment groups. The third experiment compared graphical and tabular reports for their ability to convey a "message" to the reader. Only in situations in which a vast amount of information was presented and relatively simple impressions were to be made, did subjects given graphs outperform those using tables.

This program of cumulative experiments indicates that generalized claims of superiority of graphic presentation are unsupported, at least for decision-related activities. In fact, the experiments suggest that the effectiveness of data display format is largely a function of the characteristics of the task at hand, and that impressions gleaned from "one shot" studies of the effectiveness of the use of graphs may be nothing more than situationally dependent artifacts.