

ABSTRACT

This study provided an empirical comparison of static and animated cartographic representations of spatiotemporal phenomena in their application to basic choropleth map-based knowledge-extraction tasks to answer the following research questions: 1) Do animated maps provide heightened potential for accuracy in completing basic knowledge-extraction tasks over static time-series maps, or vice versa? 2) Do animated maps provide heightened potential for efficiency in completing basic knowledge-extraction tasks over static time-series maps, or vice versa? and 3) How do user preferences align or not align with measurements of accuracy and efficiency?

To this end, this study examined map readers' accuracy and efficiency in completing knowledge-extraction tasks through static and animated time-series maps about homicide patterns in the Chicago metropolitan area. Through an online user performance experiment, participants answered a series of questions about homicide hot spots and cold spots using both static and animated versions of the maps as the basis for their answers. They were also asked to indicate their level of confidence in the accuracy of their responses and to indicate which map type they preferred for completing the tasks. Task completion times were recorded for efficiency measurements. The results of independent samples t-tests indicate statistically significant differences between the static and animated maps in terms of task accuracy and completion time. Generally, users were able to complete the assigned tasks more accurately and much more efficiently using the static maps, as compared with their animated counterparts. Additionally, user-preferences were checked for correlations with task accuracy and completion time via Pearson's product-moment correlation coefficient calculations. The results indicate no significant correlations between performance measurements and user-preferences.