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Uncovering student difficulties reasoning with data by investigating student eye movements REBECCA ROSENBLATT, Illinois State University, RAYMOND ZICH, Illinois State Univ — In this study, eye tracking is used to differentiate algebra based physics students' attention to variables and information when data is displayed in either graph or picture form. Differences in student gaze patterns - when correctly vs. incorrectly answering questions about displayed information in graph or picture form – indicate that both incorrect control of variables and incorrect logical reasoning are causing students to misinterpret the presented data. Students use reasoning schemes that work for one cause and one effect data but do not work when reasoning with multiple causes. Some students fail to control for the multiple variables and focus their gaze time on a specific variable and outcome. Other students show the correct attention to the multiple variables but employ incorrect logic. In addition, graphed data and pictured data show differences in amounts of gaze time and in where that gaze time (as a percentage of total gaze time) is allocated. This indicates that, while student response choices were on average the same for the graphed vs. pictured data, the cognitive steps necessary to solve the problem are not the same for the two ways of presenting the information.

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