Budget Understanding:
From tables to hierarchical visualizations

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Interpreting and making decisions based on budget data can be a challenging task, whether it is for personal financial management, the launching of a new business, or policy-making in government. Budget data is difficult to understand, in particular for laypeople, because it is based on formats and refers to orders of magnitude they are unfamiliar with. A typical budget report is usually presented in multipage pdf files with many tables, flat or hierarchically organized, with multiple attributes and hierarchical levels, including revenue sources, expenditure categories, and allocation among different kinds of programs. Although tabular formats are familiar to most people from many application domains, comprehending the key findings from a voluminous data set, such as the budget of a municipality or a government, can be challenging. Furthermore, undertaking analytical tasks using tables can be time-consuming and requires first access to data formats that can be editable (CSV, xls, etc.) and, second technical procedures that are unfamiliar to the general public.

Interactive information visualization can help users to interpret and gain insights from tabular data more easily. However, the representations chosen might either be too simplistic, not allowing data exploration or strongly influencing people's interpretation, or too complicated to read and understand for people without advanced data and visualization literacy skills. Subsequently, the effective visualization of this data, to help laypeople understand the information, and encourage them to perform analytical tasks, is a challenge for the visualization community. To the extent of our knowledge, there have been very limited studies on how people make sense of public budgets and accounting information, and even fewer to support them in understanding this kind of data.

In this work, we contribute
1. A taxonomy of basic but fundamental analytical tasks on budget data
2. A study of the ability of people with various data and visualization literacy to understand budget data and perform basic analytical tasks on them
3. A training program and material to support people in acquiring the skills to understand budget information using advanced tabular and hierarchical visualizations.
4. A controlled study to show how our program improves learning compared to baseline.