The GRAFIC Framework: Graphics-Relevant Advice to Facilitate Information Communication

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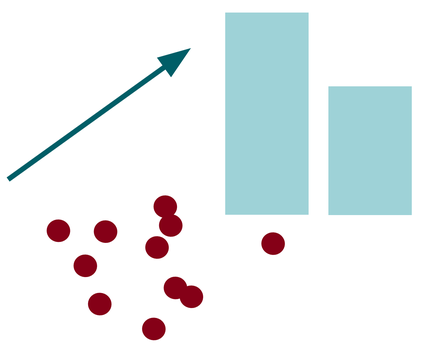
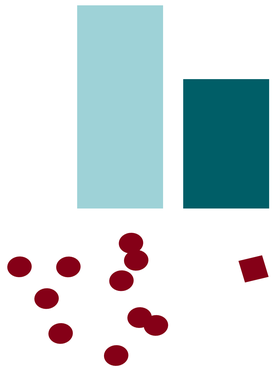
Background

- Data visualization is a predominant way people consume information in the world today; however, its definition rarely includes consumption.
- There are many creation recommendations that aim to enhance communication, few of which are grounded in evidence or examine the consumption process.

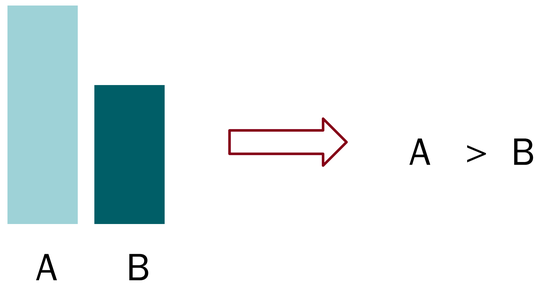
It is crucial to understand the component processes underlying the consumption of data visualization.



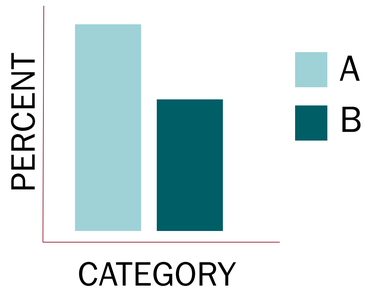
Visual Perception



Preattentive Features



Symbolic Processing



Integration

Contextualization

Proposed Framework

We draw on research in cognitive science to propose a preliminary framework that dictates the levels of processing required to make sense of visualizations. We hope that this framework will provide a starting point for the instruction of data visualization consumption and creation.

Classroom Implementation

- Multimodal data collection (video, screen recordings, student artifacts) to understand student consumption and creation of data visualization.
- Data collection activities center on data visualization recreation that hope to capture intentional consumption through think-aloud procedures.
- Intro data visualization course is currently being adjusted with plans to collect data in Fall '24.

Recreation Activities

Students will be asked to recreate familiar data visualizations with 2-3 elements they have not explicitly learned yet. The recreation worksheets have the following 3 prompts:

1. Talk out loud with your group about the elements you notice in the plot and how they might map to the code you'll need to write. List these elements below:
2. What do you notice about [specific aspect] of this plot? What is your takeaway message? Talk about this with your group.
3. Recreate the plot. Talk out loud as you code.
   a. Note that there are many ways to incorporate some of the components/elements present in the plot. For each element you add, see if you can find a different way to include it.

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