

High Income Growth States Exploration

Data Visualization CS416 Summer '23 Narrative Visualization Project

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- Messaging. What is the message you are trying to communicate with the narrative visualization?

The primary message communicated through this visualization is the correlation between states with the fastest income growth between 2020 and 2021, and lower population density. It suggests that this trend could be attributed to the COVID-19 pandemic and the subsequent rise of remote work. The visualization facilitates an exploration of two potential factors influencing income growth, highlighting one as more significant than the other.

- Narrative Structure. Which structure was your narrative visualization designed to follow (martini glass, interactive slide show or drop-down story)? How does your narrative visualization follow that structure? (All of these structures can include the opportunity to "drill-down" and explore. The difference is where that opportunity happens in the structure.)

The visualization follows an interactive slideshow structure. Users navigate along an author-guided path via 'next' and 'previous' buttons, progressing through a series of slides. Nevertheless, each slide offers the freedom to delve into details. The tooltip provides more information about data points upon hovering, while filters on scenes 2 (State income with Political Party) and 3 (State income with Population Density) allow data subset filtering.

- Visual Structure. What visual structure is used for each scene? How does it ensure the viewer can understand the data and navigate the scene? How does it highlight to urge the viewer to focus on the important parts of the data in each scene? How does it help the viewer transition to other scenes, to understand how the data connects to the data in other scenes?

- What visual structure is used for each scene?

Each scene utilizes a scatterplot to display two continuous variables. Accompanied by a text narrative and a legend to interpret any color coding, the scene layout consistency helps orient the user. A tooltip automatically pops up for easy data exploration, while prominent legends explain any color coding.

- How does it ensure the viewer can understand the data and navigate the scene?

Text is shown on top of the scatterplot to give the user the narrative and to give them directions to ensure they know what options are available to navigate the scene. The tooltip pops-up automatically so it is easy for the user to discover. Finally any color coding is described prominently in a legend of the graph.

- How does it highlight to urge the viewer to focus on the important parts of the data in each scene?

The states of most interest to the narrative are highlighted with a prominent black outline and described in the text of the narrative.

- How does it help the viewer transition to other scenes, to understand how the data connects to the data in other scenes?

The structure of the scenes are consistent so they remain oriented. The axis and data points remain the same so it is very easy for them to stay oriented, we just add additional layers based on color coding which is described in the legend. The base information is the same so it is very easy for the user to remain oriented. The user can easily see how to navigate between slides with the intuitive next and previous buttons and they can get more context in the narrative section.

- Scenes. What are the scenes of your narrative visualization? How are the scenes ordered, and why

Scene 1: State Income and Income Growth. This scene is selected to introduce the user to the problem space. This shows the user a plot of median income and income growth. We give a narrative description of the problem, and allow the user to explore by hovering over the tooltips, develop their own hypothesis and think about what leads to the high growth in certain states.

Scene 2: Political Policy and Income Growth. This scene introduces the first variable that we want to explore to see if political policies affect income growth. We chose to introduce this variable first because it doesn't have a correlation with income growth, we didn't want to get to our conclusion until the last scene. Additionally this is one of the first variables people think of when it comes to a state's economy, so I wanted to display it early.

Scene 3: Population Density and Income Growth. This scene we introduce the variable that will be the decisive variable and the scene that leads to our conclusion. This scene was chosen last because it contains the conclusion and a good ending point for the user.

- Annotations. What template was followed for the annotations, and why that template? How are the annotations used to support the messaging? Do the annotations change within a single scene, and if so, how and why

Data points of interest are marked with a prominent outline or stroke, maintaining visual balance while guiding the user's attention. As users progress through scenes, they can draw parallels among highlighted states, thereby supporting the central message. Annotations remain consistent across scenes to maintain user orientation.

- Parameters. What are the parameters of the narrative visualization? What are the states of the narrative visualization? How are the parameters used to define the state and each scene?

There are three parameters. In slide 2 and 3 the user can select if they want to filter the data. When they filter the data only the data points that match the filter parameter are shown. Specifically the filters are "Republican" and "Democrat" in slide 2 and "Urban" and "Rural" in slide 3. The last parameter is the next and previous buttons. This changes what slide the user is on and thus what additional data the user gets to explore (ie political party data or population density data)

- Triggers. What are the triggers that connect user actions to changes of state in the narrative visualization? What affordances are provided to the user to communicate to them what options are available to them in the narrative visualization?

There are three triggers that communicate to the user what options they have available to explore the data. The first is the next and previous button. These are common triggers for a user to advance the scene intuitively to go on to the next part of the data the author wants to show them. The second trigger is the filter on slide 2 and 3. The filter is controlled through a drop-down UI affordance. The box with an error is a standardized way of communicating to users that there is a drop down option and that they will be able to manipulate the scene based on what they select. The final is the tooltip trigger. This is triggered from two places. First it is triggered in the text description of the scene at the top. Second it is triggered since it automatically pops-up when the user shortly hovers over the data point, since it is automatic the user will be triggered to explore the data more.