Online Study

To examine the differences of different design factors on the understandability, we conduct a large-scale online study with a representative subset of 20 of our collected real-world data-GIFs, as seen in "stimuli.html" in the supplementary materials. The experiment was hosted on the Qualtrics survey platform.
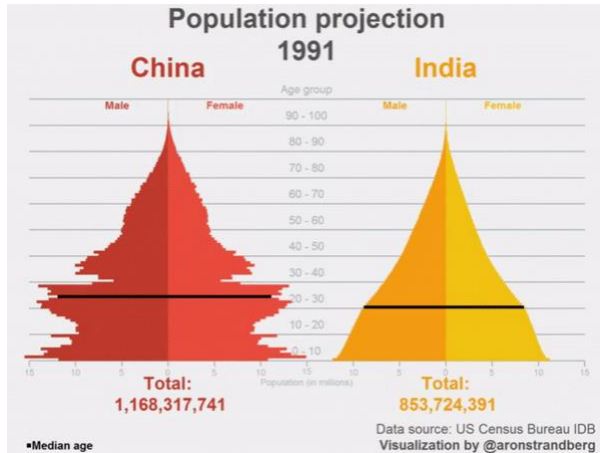
The study began with a brief description of the data-GIF concept, along with the experiment details and its duration (around 15 minutes for a total of 5 sessions), as shown in .

For each session, participants first saw the title of the upcoming data-GIF for 10 seconds, and then watched the GIF (randomly selected from the 20 samples) repeating three times continuously. Later, we hid the GIF, and participants were directed to a questionnaire page. The questions for each GIF can be found in , including: *a)* two 5-point Likert scores for how well they could follow the GIF before and after the questionnaire, ranging from not at all (1) to very well (5); *b)* two open-ended questions listing up elements which helped or hindered the understanding, respectively; and *c)* three multi-choice questions about content and encoding understanding.

After finishing 5 sessions, participants were asked to fill out a short demographic form, as shown in .

Introduction

Goal: This experiment is designed to evaluate the understandability of Data-GIFs, which display animated visualization in the format of GIF (that is, automatically repeat the content in silence).

(In the formal study, we provide the animated version.)

Experiment procedure:

- This study takes approximately 15 minutes to complete in total 5 sessions. In each session,
    1. You will first see the title of the upcoming Data-GIF for 10 seconds, followed by the Data-GIF repeating only 3 times, without control over pace and pause.
    2. Later, we will hide the GIF, and you are required to complete the questions.
- Please **respond honestly to each question** based on your understanding. **It's OK to not know the answer**, as we aim to evaluate the GIF, not you.
- For unknown questions, please **do not guess** and **choose the option "I don't know".**
- Some GIFs may take longer for loading, please wait patiently.
- Upon successful participation, you will become part of a raffle to win a $5 (~40 hkd) amazon voucher. We provide the prize for 30% of all the subjects.

Questionnaire for each GIF

1. Have you ever seen this GIF before?
    a. Yes
    b. No

2. How well could you follow the GIF?
    a. Not at all
    b. Not well
    c. Neutral
    d. Well
    e. Very well

3. Please list as many things as possible that **helped you follow** the GIF and start with the most important things (e.g., visualization types, text, animation, progress bar, pause, previous data, etc.)

4. Please list as many things as possible that made it **hard to follow** the GIF and start with the most difficult elements (e.g., visualization types, text, animation, progress bar, pause, previous data, etc.)

 ------------- Three comprehension questions -------------

We provide three multi-choice questions for each GIF about content and encoding understanding, which were proposed based on the GIFs' source articles and our interview feedback. Each question had five options, including four answer possibilities and "I don't know". The questions for the specific GIF can be found in "stimuli.html" in the supplementary materials.

 ------------- Three comprehension questions -------------

8. In general, after answering the questions, how do you rate the understandability of this GIF? This can be different from your first impression indicated above.
    a. Not at all
    b. Not well
    c. Neutral
    d. Well
    e. Very well

9. Any other comments for this Data-GIF?

Demographic form

1. Age:

2. Level of knowledge reading data charts:
   a. No knowledge
   b. Basic level
   c. Intermediate
   d. Expert

3. How many hours do you spend browsing online every day?