Study #1:

**Setup**
Participants from Amazon Mechanical Turk
- Native English speakers
- Coding
- Brush interactions
- Decisive brushes
- Number of subsequent trails decisive brushes were used
- Participant's answers

**Analysis**
- Point estimates and 95% CI based on 10,000 percentile bootstrap replicates

**Experiment #1:**
Are people inclined to interact with charts to carry out fact-checking tasks?

- **H1.1:** A majority of participants will not know that the charts are interactive, and therefore they will not use them to complete trials
- **H1.2:** A majority of participants who ‘discover’ the interactivity of the charts will use them throughout all subsequent trails

**Experiment #2:**

- **H2.1:** not all participants interacted with charts
- **H2.2:** majority of participants will use the charts in trials [6-7]
- **H2.3:** results will be consistent with **Experiment #1**, meaning Wikipedia styling did not bias participants’ behaviour

**Study #2:**
Design Space for Suggested Interactivity

**Study #3:**
Testing Three SI Cues on Bar Charts

**Analysis and Critique**

**Important Results**
- **H2.1:** failed: not all participants interacted with charts
- **H2.2:** confirmed
- **H2.3:** confirmed
- **H2.4:** confirmed

**Results**
- Consistent with **Experiment #1**
- **Conclusion:** charts are more efficient

**Study #1:**

**Setup**
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**Experiment #1:**
Are people inclined to interact with charts to carry out fact-checking tasks?

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**Experiment #2:**
Are charts more efficient than text?

- **H2.1:** all participants will interact with the charts in trials [3-5]
- **H2.2:** majority of participants will use the charts in trials [6-7]
- **H2.3:** there will be good evidence that more participants interact with the charts in trials [6-7] than in [1,2]
- **H2.4:** participants should complete trials [6,7] faster than [1,2]

**Results**

- **Analysis and Critique**
- **Conclusion:** charts are more efficient
### Definitions

**Suggested Interactivity (SI):** set of methods for indicating that a graphical area can be interacted with by subtly directing a user's attention so as not to impede too heavily on this person's focus or on the rest of the interface design.

**Cues:** specific graphical elements or attributes that are used for suggesting interactivity.

### Study #2: Results and Observations

SI cues are mostly applied to object of interest

- **Animation** is determined by what triggers it
  - Staged animation -> system events
  - Dynamic animation -> user events

**Combinations:** interest attractor and external object attractor
- Feedforward

**Dimensions useful for analyzing current visualizations but too complex when it comes to creating new ones**

### Design Space for Suggested Interactivity

**Attractor:** the object that attracts attention to the interactive area
- Object of interest

**Animation:** the state of the attractor over time
- Staged: links
- Interpolation: unique or looped
- Dynamic:
  - System event
  - User event

**Visual attributes:** the specific visual variables and/or marks the animation is applied to

**Persistence:** the ongoing display or not of the cue once the interaction has been performed

### Design Considerations

**Visualisations as attractors**
- Already depend on visual marks
- Should not play with free visual attributes
- Required animation:
  - Staged: organic motion = heartbeat (dynamic: attractive motion = orienting, squeezing, stretching depending on how far mouse is)

**Icons as attractors**
- Focal icon
- Identifier icon
- Demonstrator icon

### Suggested Interactivity #1

#### Study #3: Testing Three SI Cues on Bar Charts

**Attractor:** visualization
**Animation:** staged, looped
- Organic motion: heartbeat
**Trigger:** page-load
**Persistent:** no

### Follow up study results

- Conducted follow-up study on AMT
- Reproduced Experiment #1 three times applying each SI between subjects design

**H4:** more participants will perform brush interactions and decisive brushes when an SI cue is applied to the charts

**Results:**
- No evidence that S1 or S2 had any effect
- S3 had an effect

### Overall Conclusion

- Lack initial propensity to interact with charts
- Low interaction literacy
- Suggested Interactivity is necessary
- Subtle cues are not effective
- Feedforward is crucial

### Questions?

#### Analysis and Critique

**Study #2**

- **Attractor:** focal icon
- **Animation:** no
- **Trigger:** page-load
- **Persistent:** yes
  - Visible when out of focus

**Study #3**

- **Attractor:** visualization and demonstrator icon
- **Animation:** looped staged
- **Visual mark:** text label
- **Trigger:** page-load
- **Persistent:** no

### Study #1

- **Attractor:** visualization
- **Animation:** staged, looped
- **Trigger:** page-load
- **Persistent:** no

### Analysis: What, Why, How

<table>
<thead>
<tr>
<th>What</th>
<th>Suggested Interactivity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Why</td>
<td>Any Visualization embedded in text</td>
</tr>
<tr>
<td>How</td>
<td>S1 Motion</td>
</tr>
<tr>
<td></td>
<td>S2 Overlay Focal Icon</td>
</tr>
<tr>
<td></td>
<td>S3 Motion + external icon</td>
</tr>
</tbody>
</table>

**Critique**

- Small scope
  - Only visualizations embedded in text
  - Only considered 3 SI options
  - Specific task
  - Only focused on hovering on bar charts
  - Didn't consider age or experience of users
  - Only a transition phase

- **http://www.cs.ubc.ca/~tmm/courses/547-15/**