

present statistic data chart Sequentially VS Un-sequentially

QUESTION

Which is the more effective way to present statistical data charts, sequentially or unsequentially?

MOTIVATION

- Storytelling strategy benefits the effectiveness of visualization; Sequence is important in storytelling (Segel & Heer, 2010)
- Sequence in slideshow (Hullman et.al, 2013)
- Sequence in animation transition (Heer & Robertson, 2007)
- Sequence in presenting a single data chart?

APPROACH

Materials:

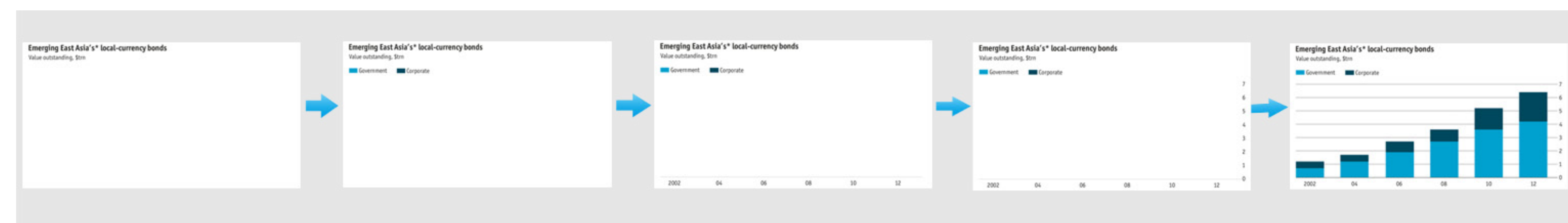
The Economics, Daily Graph, 2013-2014, 3 bar+3 line+3 scatterplot

Platform:

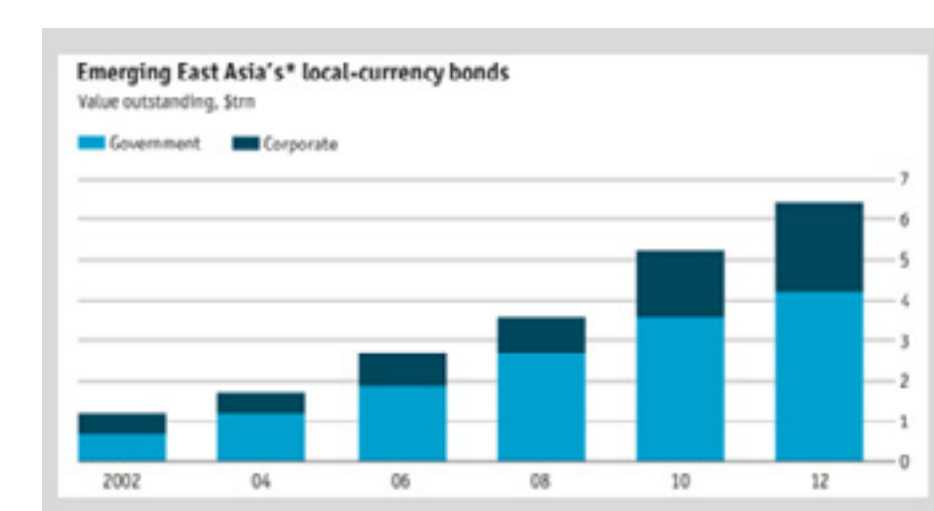
Amazon Mechanical Turk, 18 HIT, per 10 assignments

Task:

Sequentially: 2s --> 2s --> 2s --> 2s --> 5s



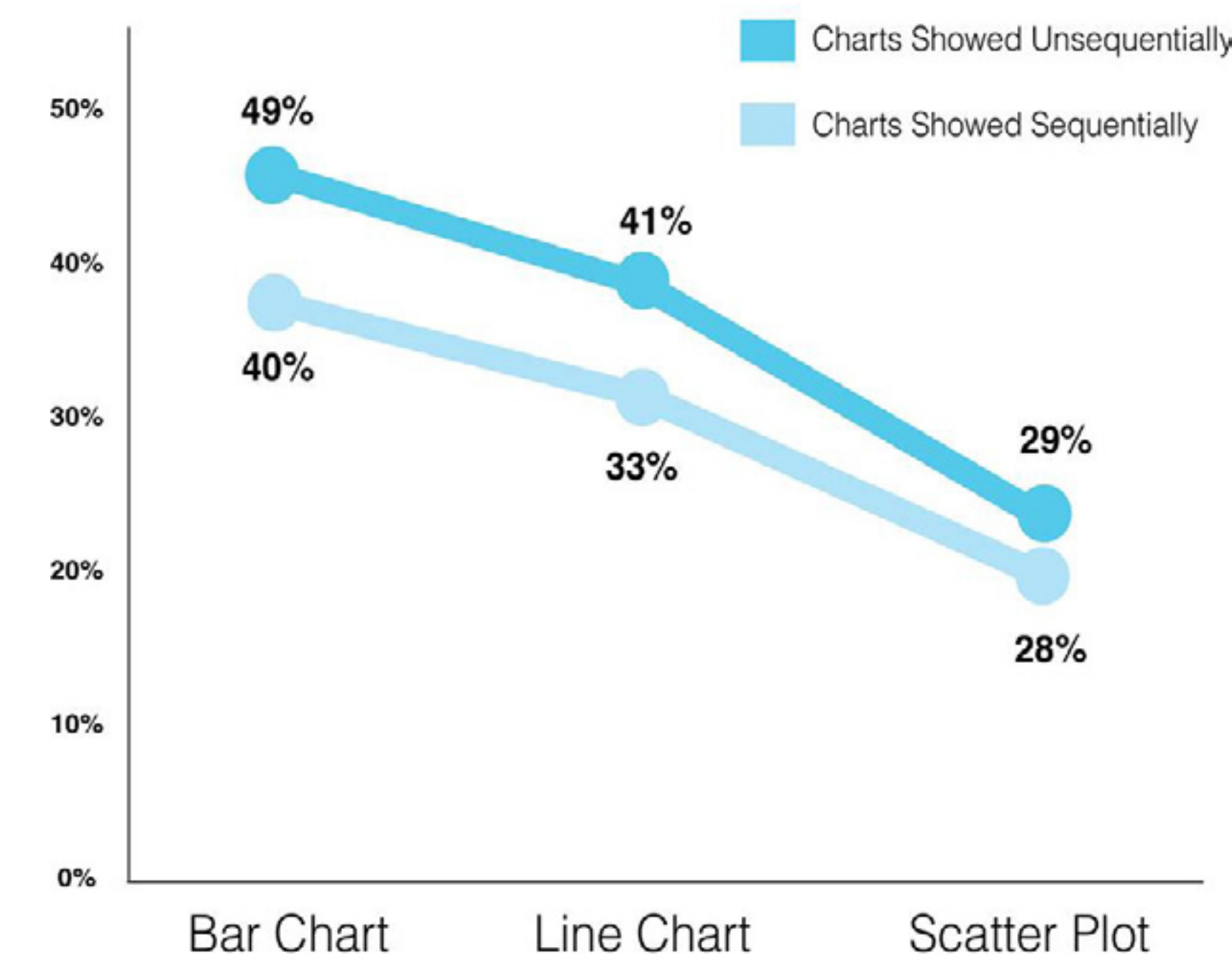
Un-sequentially: 13s



Questions:

1. about axis;
2. about content;
3. open insights;
4. scale of understanding;
5. view path;
- 6 effectiveness

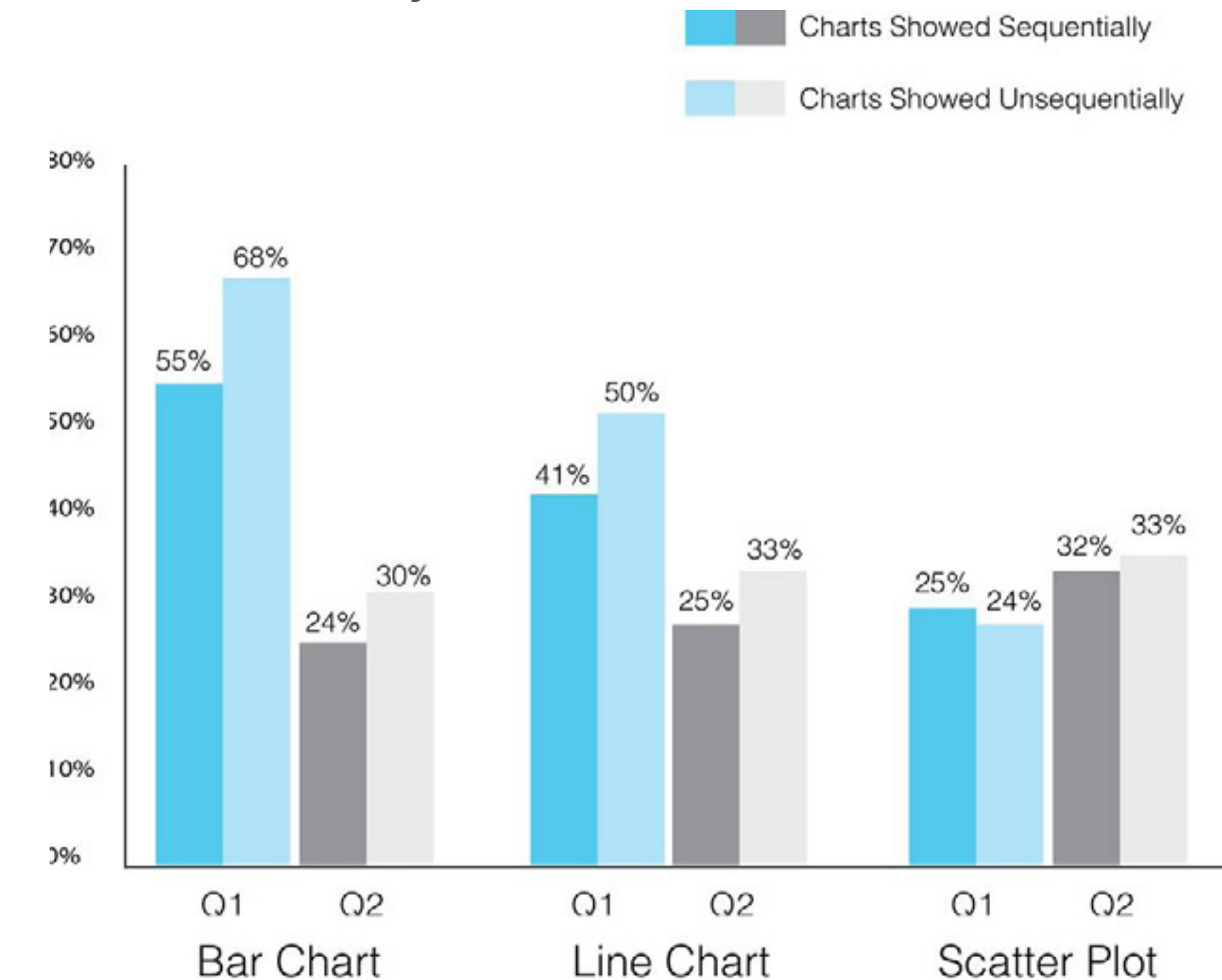
RESULT



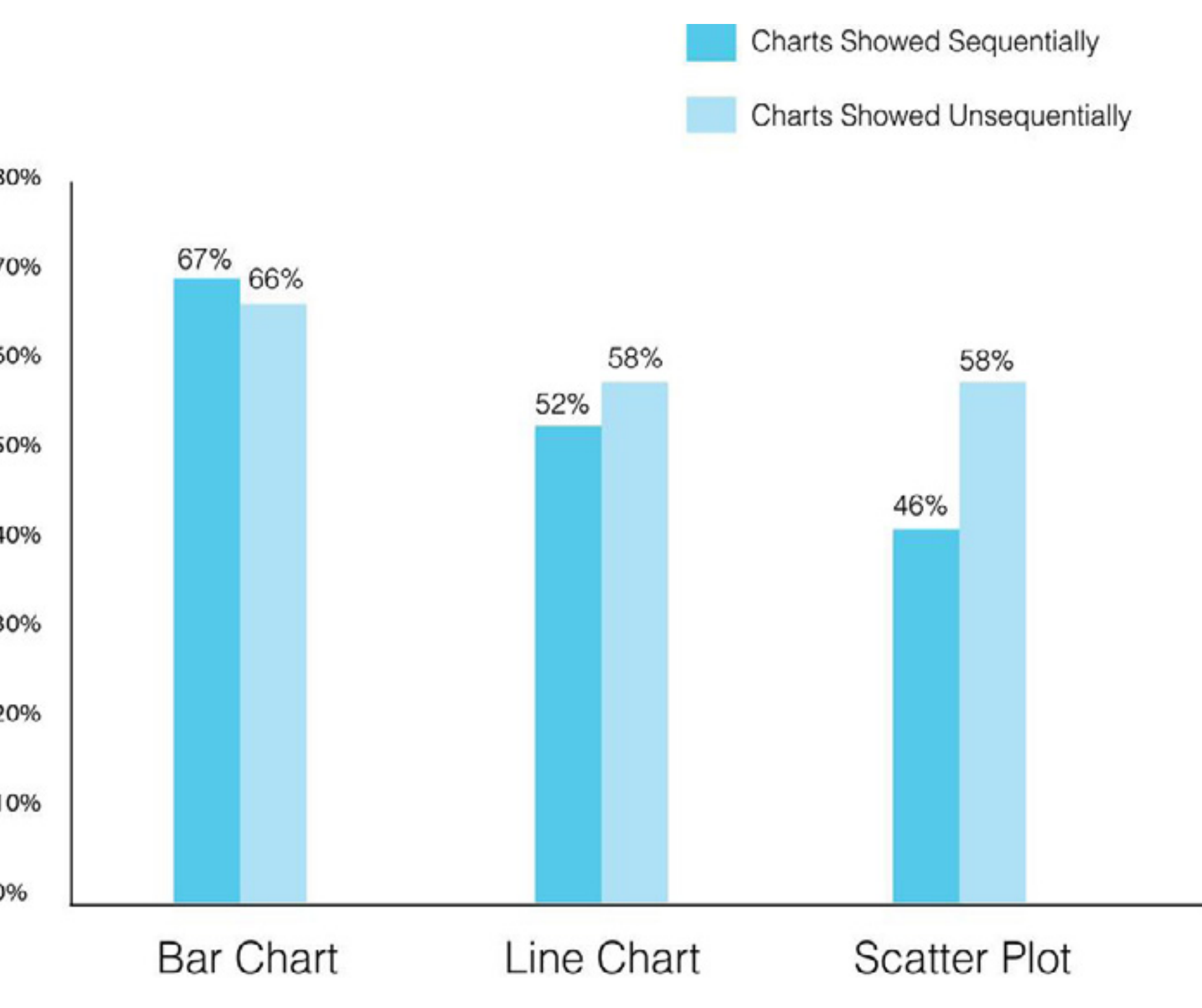
- The objective questions(Q1&Q2) accuracy of unsequentially is higher than unsequentially.

- Barchart > linechart > scatterplot

F1: accuracy



F2: accuracy Q1 VS Q2



F3: average of understanding

Conclusion:

- Presenting the data charts sequentially is not proved as “effective” as presenting unsequentially.
- Scatterplot has different view path from barchart and linechart.

FUTURE WORK

- Redo the experiment; change timing, questions (recognitize-->recall)
- Eye-tracking, view order/pattern of (different) charts
- Narration + Sequentially graph > Narration + Unsequentially?

REFERENCE

- [1] Segel, E., & Heer, J. (2010). Narrative visualization: Telling stories with data. Visualization and Computer Graphics, IEEE Transactions on, 16(6), 1139-1148.
- [2] Hullman, J., & Diakopoulos, N. (2011). Visualization rhetoric: Framing effects in narrative visualization. Visualization and Computer Graphics, IEEE Transactions on, 17(12), 2231-2240.
- [3] Hullman, J., Drucker, S., Henry Riche, N., Lee, B., Fisher, D., & Adar, E. (2013). A deeper understanding of sequence in narrative visualization. Visualization and Computer Graphics, IEEE Transactions on, 19(12), 2406-2415.
- [4] Heer, J., & Robertson, G. G. (2007). Animated transitions in statistical data graphics. Visualization and Computer Graphics, IEEE Transactions on, 13(6), 1240-1247.

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