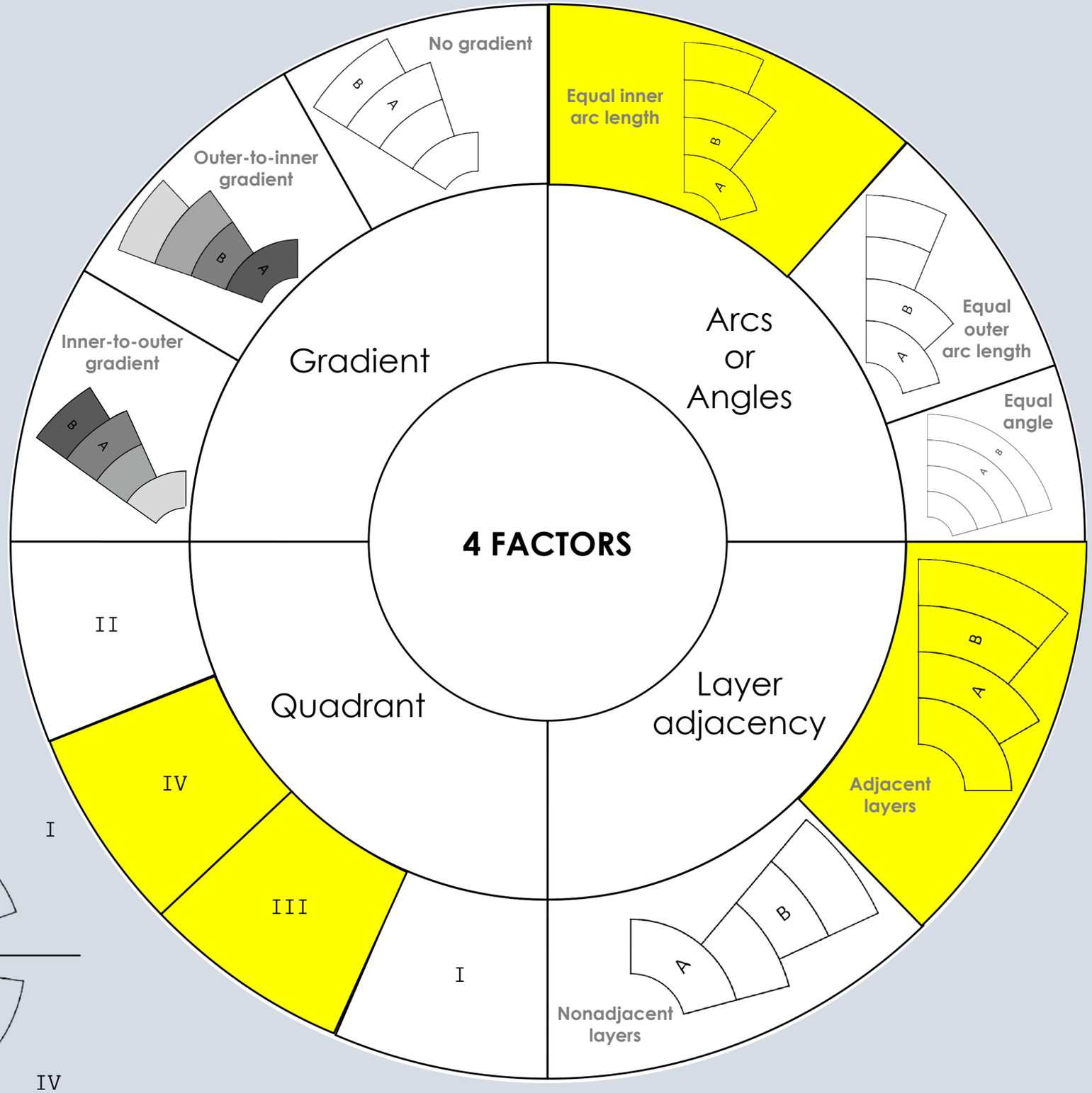
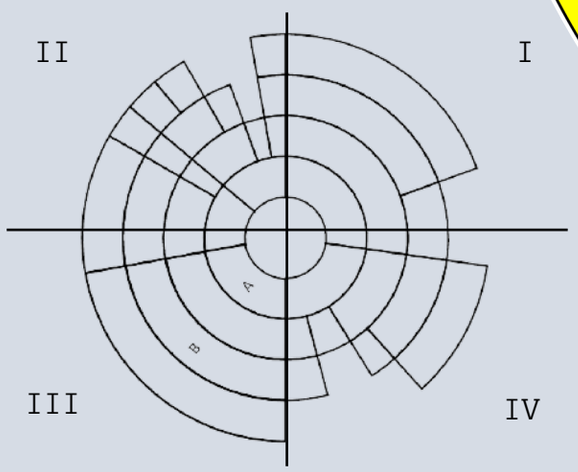
FAMILIARITY VS. CORRECTNESS: ARCS AND ANGLES IN SUNBURST CHARTS

ABSTRACT

A Sunburst chart visualizes hierarchical data as concentric rings. Similar to a pie chart, a Sunburst chart may be read through arc lengths or sector angles, but its multilevel nature makes arc lengths across levels unreliable as a visual variable. In this study, we designed Sunburst chart variations to test whether they affect chart reading performance. We found that the participants used arc lengths to read chart values, confirming a previous study. Other factors in the experiment suggested that the values in focus should be placed in adjacent layers and in quadrant III and IV as the participants tended to correctly read data values through angles instead.





A Sunburst chart whose marked portions were in quadrant III as illustrated.

RESULTS AND DISCUSSION

Regarding angle or arc length as the main visual variable of a Sunburst chart, we got a significant result ($p < 0.0001$) indicating that most of the participants used arc length to read data values, despite the fact that angle was the correct information bearer in a Sunburst chart.

The gradient turned out to be irrelevant ($p = 0.175$) indicating that there are no significant data reading differences among Sunburst charts without gradient, with outer gradient, and with inner gradient. Marked data values in segments in adjacent layers were read more accurately than those in non-adjacent layers ($p = 0.007$). Different quadrants significantly affected data reading task ($p = 0.014$). While the left and right quadrants did not affect chart reading, marked portions in quadrant III and quadrant IV tend to be read through the correct visual variable (angle) more than those in quadrant I and quadrant II.

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