

Decoding a Complex Visualization in a Science Museum – An Empirical Study

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Abstract—This study describes a detailed analysis of museum visitors' decoding process as they used a visualization designed to support exploration of a large, complex dataset. Quantitative and qualitative analyses revealed that it took, on average, 43 seconds for visitors to decode enough of the visualization to see patterns and relationships in the underlying data represented, and 54 seconds to arrive at their first correct data interpretation. Furthermore, visitors decoded throughout and not only upon initial use of the visualization. The study analyzed think-aloud data to identify issues visitors had mapping the visual representations to their intended referents, examine why they occurred, and consider if and how these decoding issues were resolved. The paper also describes how multiple visual encodings both helped and hindered decoding and concludes with implications on the design and adaptation of visualizations for informal science learning venues.

Index Terms—Museums, informal science learning, interactive exhibit, public data visualization, decoding, visual encoding

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