Common Angle Plots as perception-true visualizations of categorical associations

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***Abstract*—Visualizations are great tools of communications - they summarize findings and quickly convey main messages to our audience. As designers of charts we have to make sure that information is shown with a minimum of distortion. We have to also consider illusions and other perceptual limitations of our audience. In this paper we discuss the effect and strength of the line width illusion, a Müller-Lyer type illusion, on designs related to displaying associations between categorical variables. Parallel sets and hammock plots are both affected by line width illusions. We introduce the common-angle plot as an alternative method for displaying categorical data in a manner that minimizes the effect from perceptual illusions. Finally, we present results from user studies as evidence that common angle charts resolve problems with the line width illusion.**

***Index Terms*—Linewidth illusion, Data Visualization, High-dimensional Displays, Parallel Sets, Hammock Plots, Müller-Lyer Illusion.**

I. Introduction

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II. Conclusion

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Appendix A
Proof of the First Zonklar Equation

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Appendix B

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Marie Vendettuoli is a graduate student at Iowa State University, with majors in Human Computer Interaction and Bioinfomatics & Computational Biology. She is a past IGERT Fellow and currently interns with the Statistics section at USDA. Her research interests involve the use of interactive visualizations in exploratory data analysis.