Choosing Color Palettes for Statistical Graphics

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Abstract

Statistical graphs are often augmented by the use of color coding information contained in some variable. When this involves the shading of areas (and not only points or lines)—e.g., as in barplots, pie charts, mosaic displays or heatmaps—it is important that the colors are perceptual-based and do not introduce optical illusions or systematic bias. Here, we discuss how the perceptual based HCL color space can be used for deriving suitable color palettes for coding categorical data (qualitative palettes) and numerical variables (sequential and diverging palettes).

Keywords: qualitative palette, sequential palette, diverging palette, HCL colors, HSV colors, perceptual-based color space.
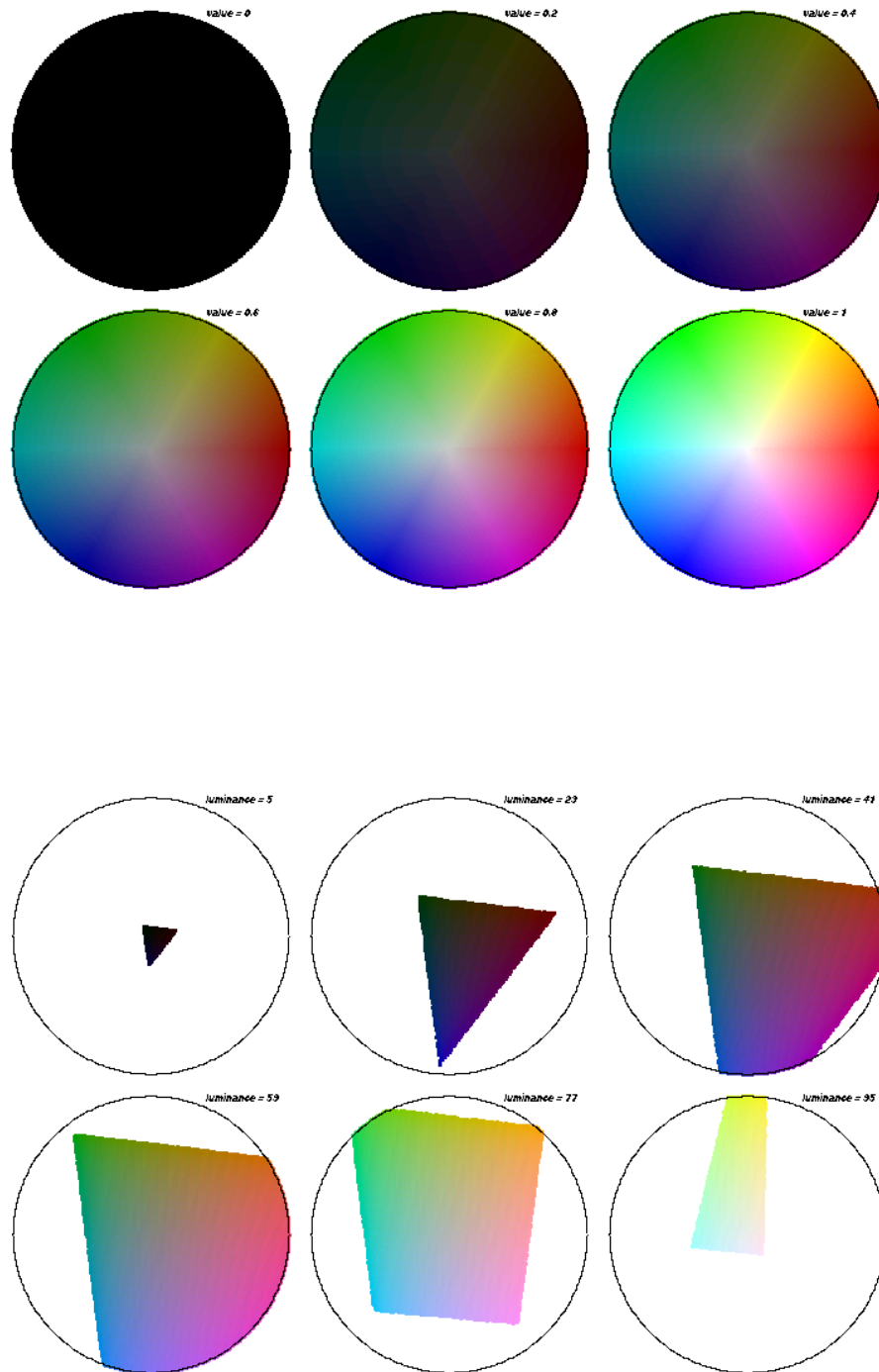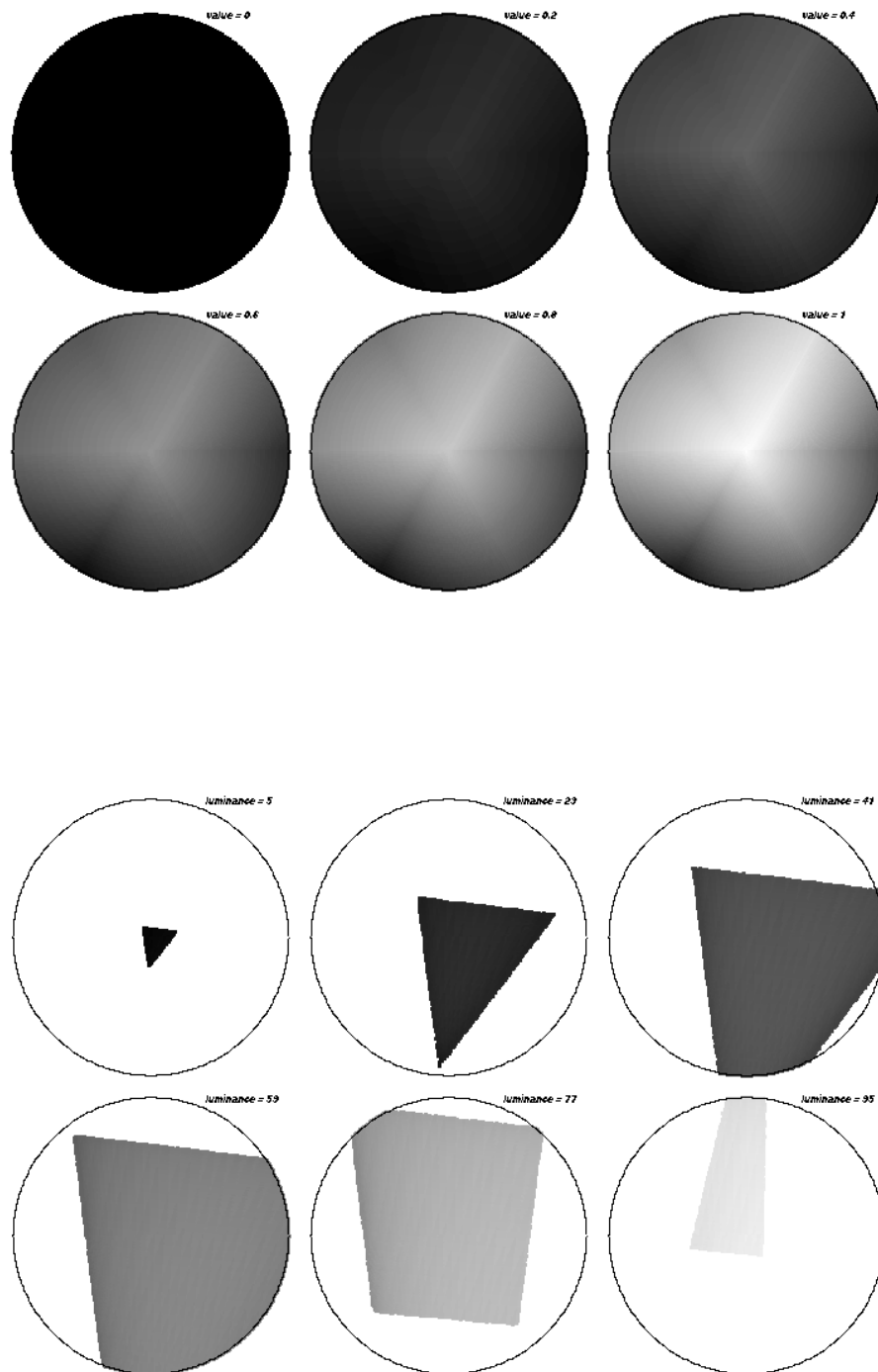
Figure 1: HSV and HCL space

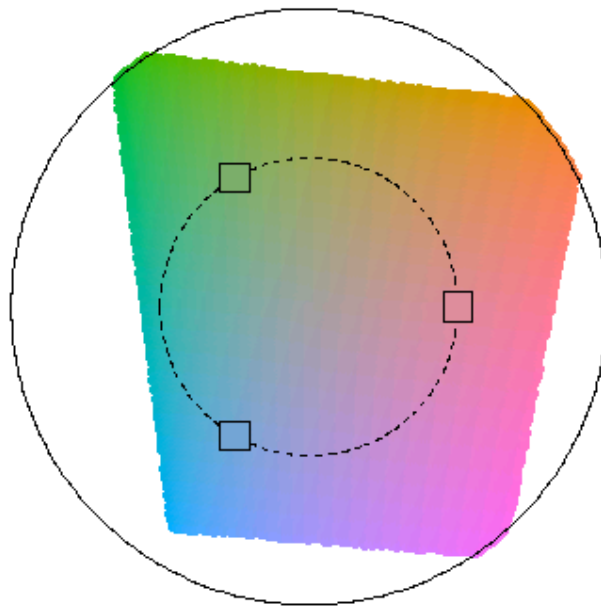Figure 2: HSV and HCL space (in gray levels)

Figure 3: Constructing qualitative palettes

Figure 4: Constructing sequential palettes
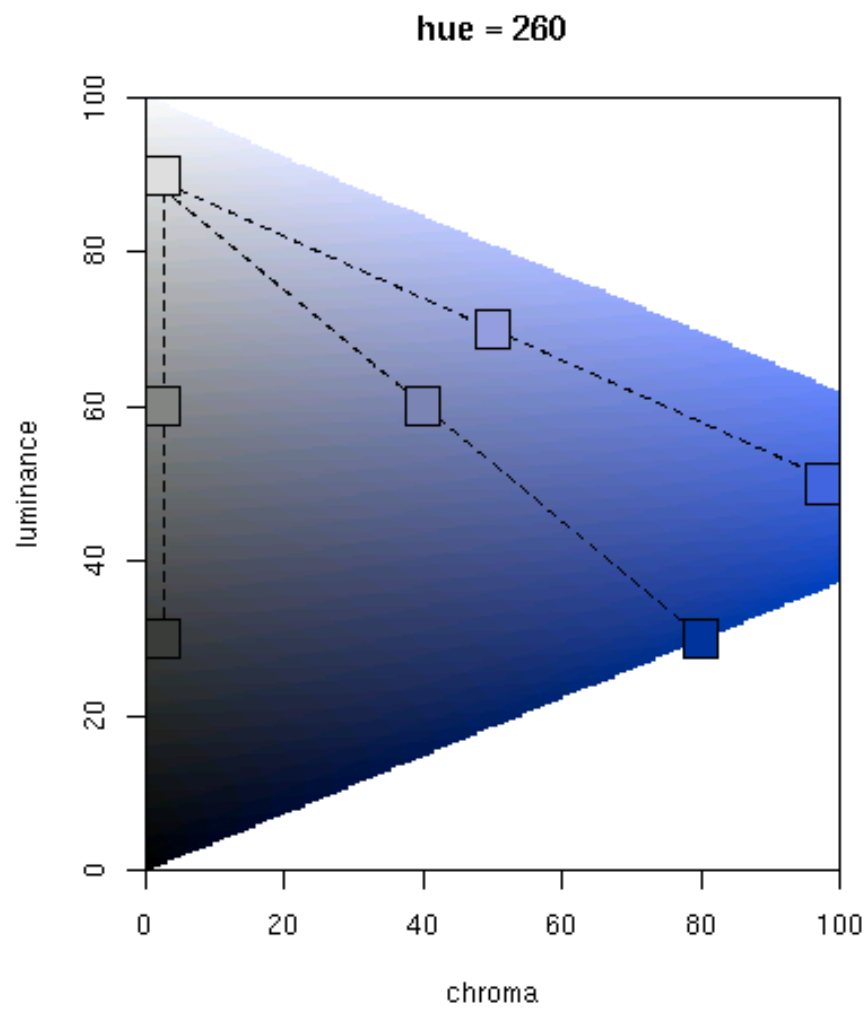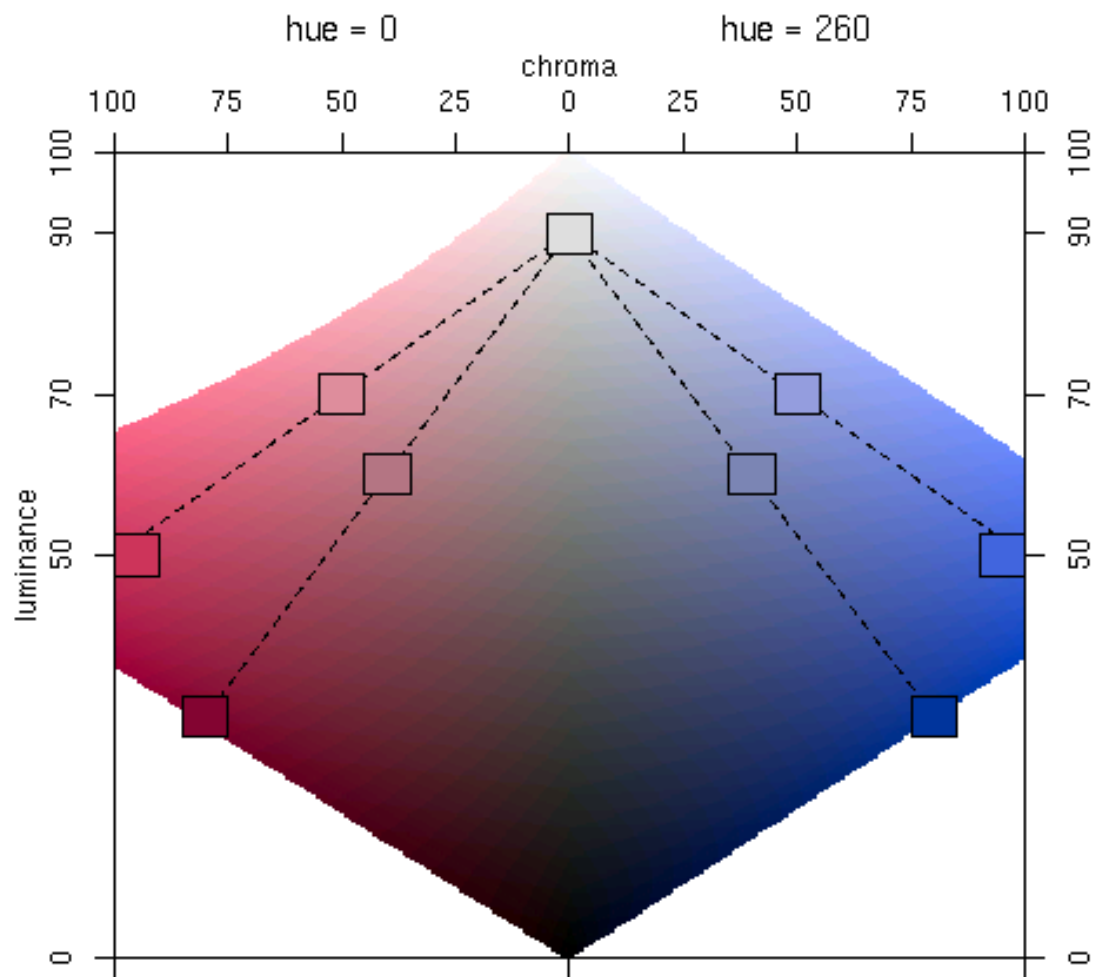
Figure 5: Constructing diverging palettes

dynamic (360 deg)　　　　**harmonic (180 deg)**
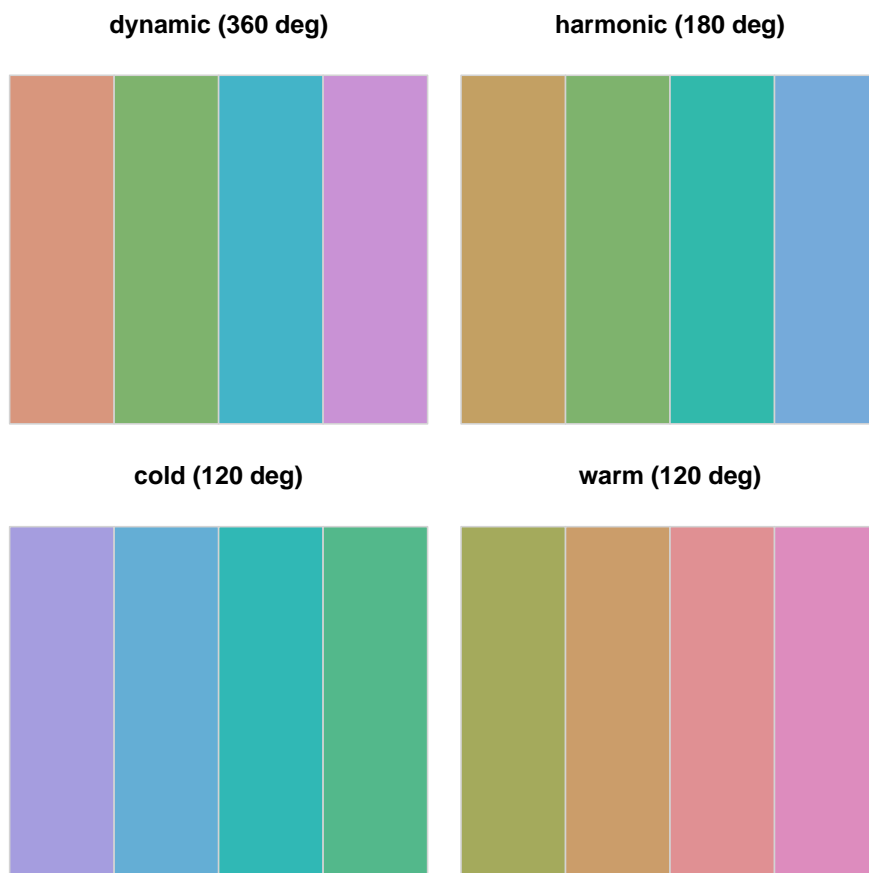
cold (120 deg)　　　　**warm (120 deg)**
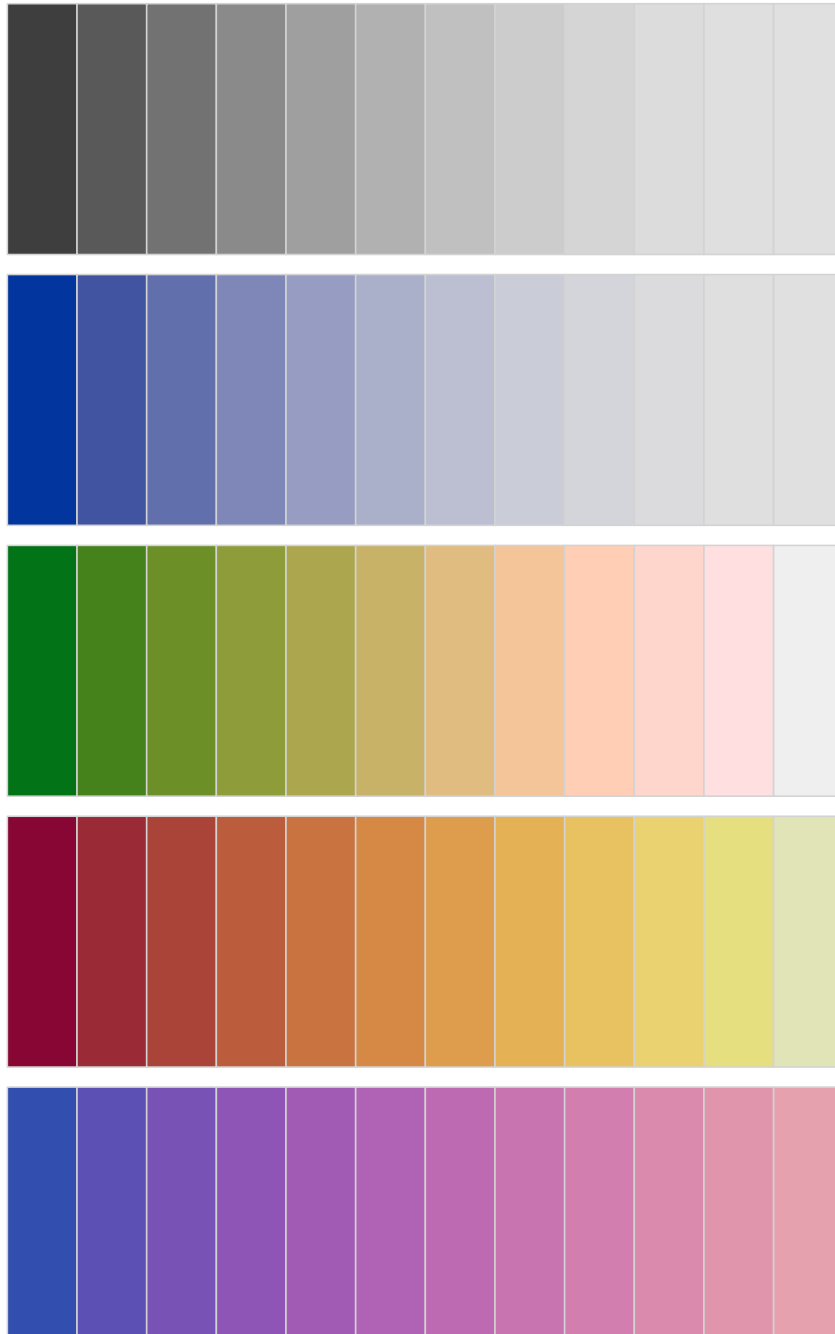
Figure 6: Examples for qualitative palettes

Figure 7: Examples for sequential palettes

Figure 8: Examples for diverging palettes