Analog Color Management in the 21st century

Fine-tuning color communication
What’s your favorite color?

Blue

How do we communicate about color?

- **Primary/abstract**
  - White
  - Black
  - Red
  - Yellow
  - Green
  - Blue
  - Brown
  - Gray

- **Descriptive**
  - Salmon
  - Eggshell
  - Turquoise
  - Olive
  - Canary
  - Mahogany
  - Charcoal
  - Coral
Professor Albert Munsell created a system to break color down into different parts:

- Hue
- Value
- Chroma
Effective Color Communication

The USDA adopted Munsell’s system in the 1930s as a standardized way to communicate soil type and quality.
Effective Color Communication

Figure 17. CIELAB color chart

CIE Color Space Notations

L*
Effective Color Communication
Spectrophotometer Use

- Visually assessed lab dips in a light box
- Measured samples with spectro
- Gave direction based on information from both
  - Very slightly less saturated, slightly more red, aim for the upper right quadrant
Spectrophotometer Use

- Effective with a limited amount of colors.
- Physical standards have tolerances as well:
  - Can measure standards themselves and notate for visual analysis.
- Does not work on heathered fabrics.

![Diagram showing color measurement]
Adventures in Screenprinting
Adventures in Screenprinting

The idea of spectrophotometer use is tempting, but…

- Simulated a new process:
  - Idea was to not have supplier send sample unless all colors measured at a $\Delta E$ of 2 or less
  - Would save on development time and shipping costs from Asia
Adventures in Screenprinting

The idea of spectrophotometer use is tempting, but…

- Result – too much variation
  - This included variation in measurements of approved colors in which pigment was not changed from one sample to the next
  - Too time consuming with not enough benefit
Adventures in Screenprinting

The idea of spectrophotometer use is tempting, but…

- Per season:
  - 150 patterns, with an average of 10 screens per pattern = 1500 screens
  - 1500 screens x 2 rounds of hand sample = 3000 screens
  - 3000 screens + 1 round of full width sample + 1 round of production = 6000 screens
Adventures in Screenprinting

The idea of spectrophotometer use is tempting, but…

A 0/45° spectro is measuring where one color falls in color space – does not take into account surrounding colors
Interaction of Color

- Human eyes are easily tricked
- Humans are viewing our product
How do we effectively communicate about color?

- Hue, saturation, value
Characteristics of Color
Characteristics of Color
Characteristics of Color
“go more yellow”

“go more blue”
Characteristics of Color
Characteristics of Color
Confounding Variables

Ice cream and homicide
Confounding Variables

Ice cream and homicide
Light Source

DAYLIGHT (D65)  
COOL WHITE FLOURESCENT (CWF)  
CANDLELIGHT (1000K)
Viewing Angle
Color Standards

- Color standards can be:
  - Paper printouts
  - Digitally printed fabric
  - Pantones
  - CSI swatches
  - Paint chips?!
  - Other fabric (wovens, fabric from past seasons)

- Production Black and Production White
Color Vision Testing

FARNSWORTH-MUNSELL 100 HUE TEST

shows how accurately a person can discriminate between small differences in color hue
Color Vision Testing

FARNSWORTH-MUNSELL 100 HUE TEST

shows how accurately a person can discriminate between small differences in color hue
Things to Remember

- Color testing
- Building rapport
- Make sure viewing in the same light
  - Agreed-upon primary and secondary light sources
    - If you have a standard form, this can be an easily checked box at the top which is easily referenced
  - Light box needs to be maintained
  - Viewing from the same angle
  - Avoid metamerism but also accepting that it’s impossible to match perfectly across light sources
- Checking production throughout – big runs? checking across the width and length of a swatch
Most important

- Building and maintaining rapport
- Consistent communication
- Checking production throughout
- Realistic expectations
Thank you for attending!