Semantic Effects on Aesthetic Preference for Color Harmony in Visual Displays

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Do Color Preferences Vary with Context?

Previous Research

Preference for color combinations:

People generally prefer more harmonious color pairs, which contain colors that are similar in hue, cool, and desaturated (Schloss & Palmer, 2011).
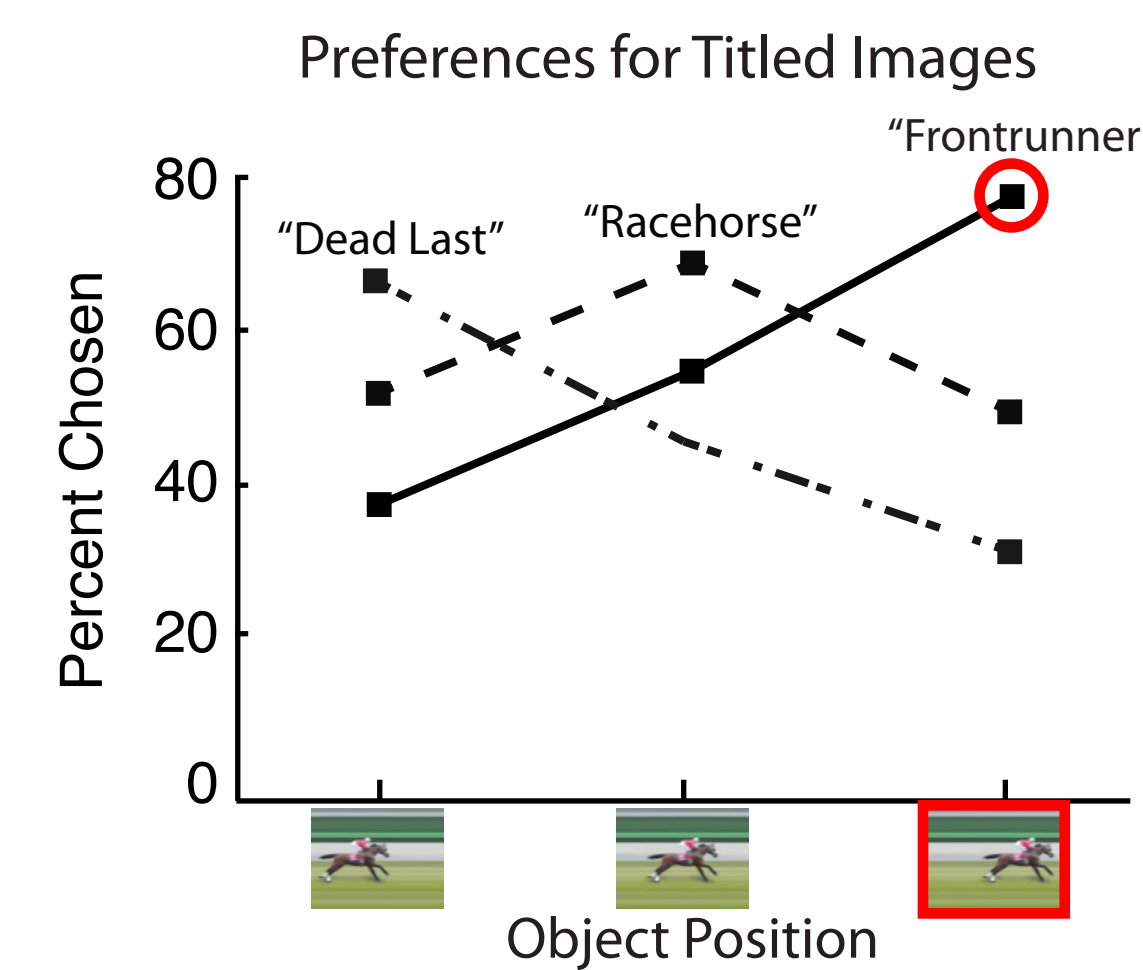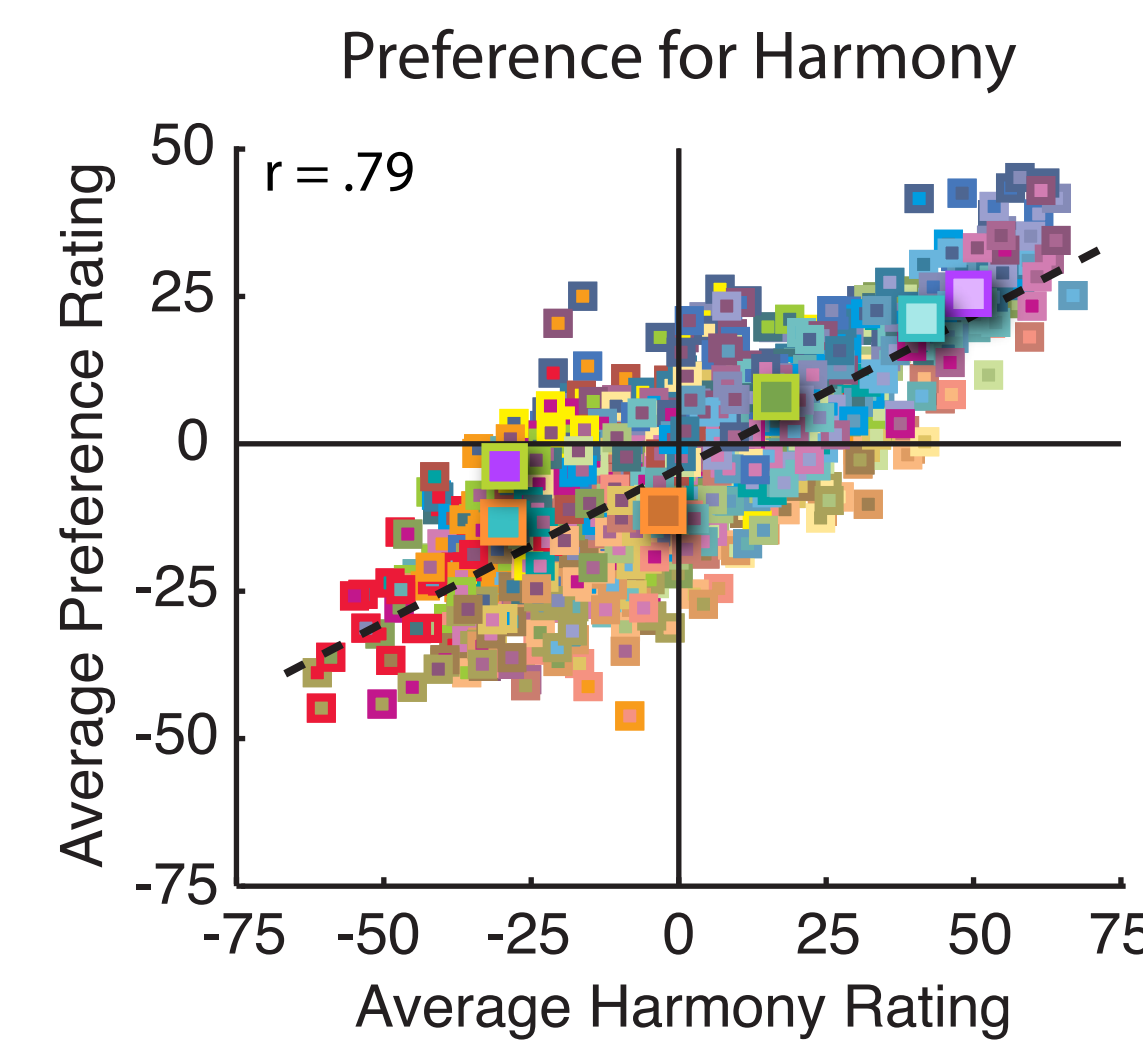
Preference for spatial composition:

People generally prefer objects to be near the center of the frame (a *center bias*) and facing inward (an *inward bias*) (Palmer, Gardner, & Wickens, 2008).
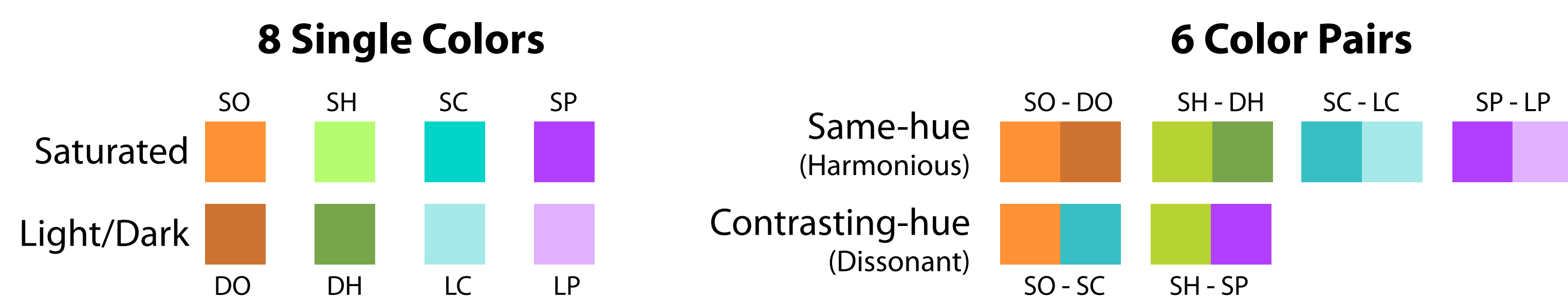
However, violations of the default inward bias can be preferred for an appropriate contextual title (Sammartino & Palmer, submitted).

Research Question

Does context affect color pair preferences? More specifically, will less preferred, dissonant color pairs be more preferred in the context of an album cover for a dissonant band?

Preference for Harmony (r = .79)

Preferences for Titled Images

Stimuli and Displays

8 Single Colors

Saturated: SO SH SC SP
Light/Dark: DO DH LC LP

6 Color Pairs

Same-hue (Harmonious): SO - DO, SH - DH, SC - LC, SP - LP
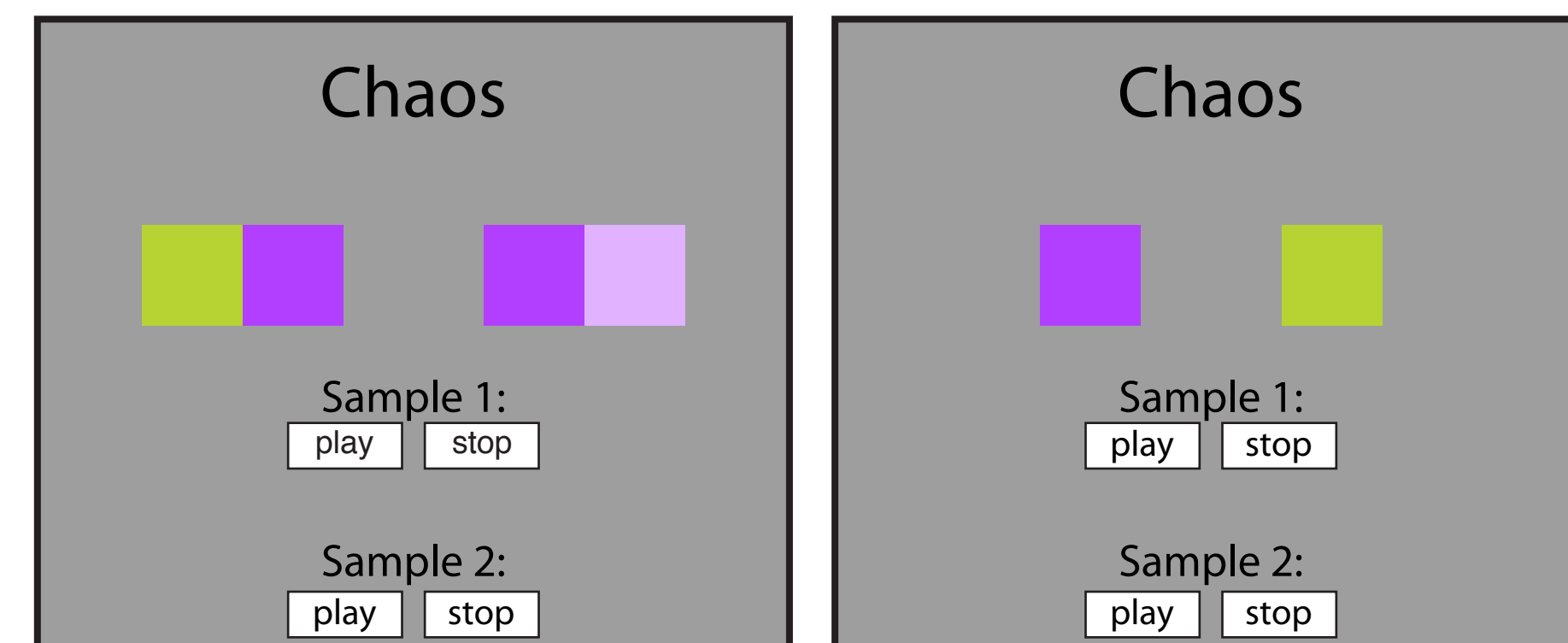Contrasting-hue (Dissonant): SO - SC, SH - SP

4 Musical Groups

Harmonious:
"Peace" (Music by Celine Dion)
"Unity" (Music by Enya)

Dissonant:
"Chaos" (Music by Skin Yard)
"Friction" (Music by Slipknot)

Example Displays

Chaos — Sample 1: play stop — Sample 2: play stop

Chaos — Sample 1: play stop — Sample 2: play stop

Experiment 1: Color Preferences and Band Context

Group 1: Band-Related Choices
For each band's album color, participants chose (2AFC):
1. the more preferred color pair (of 2)
2. the more preferred single color (of 2)
3. the color pair (of 2) that fits the band better
4. the single color (of 2) that fits the band better

Contextless Preference Ratings:
5. Color pair preference
6. Single color preference
7. Color pair harmony
8. Single color harmony

Group 2: Contextless Choices (No Band)
With no semantic context, participants chose (2AFC):
1. the more preferred color pair (of 2)
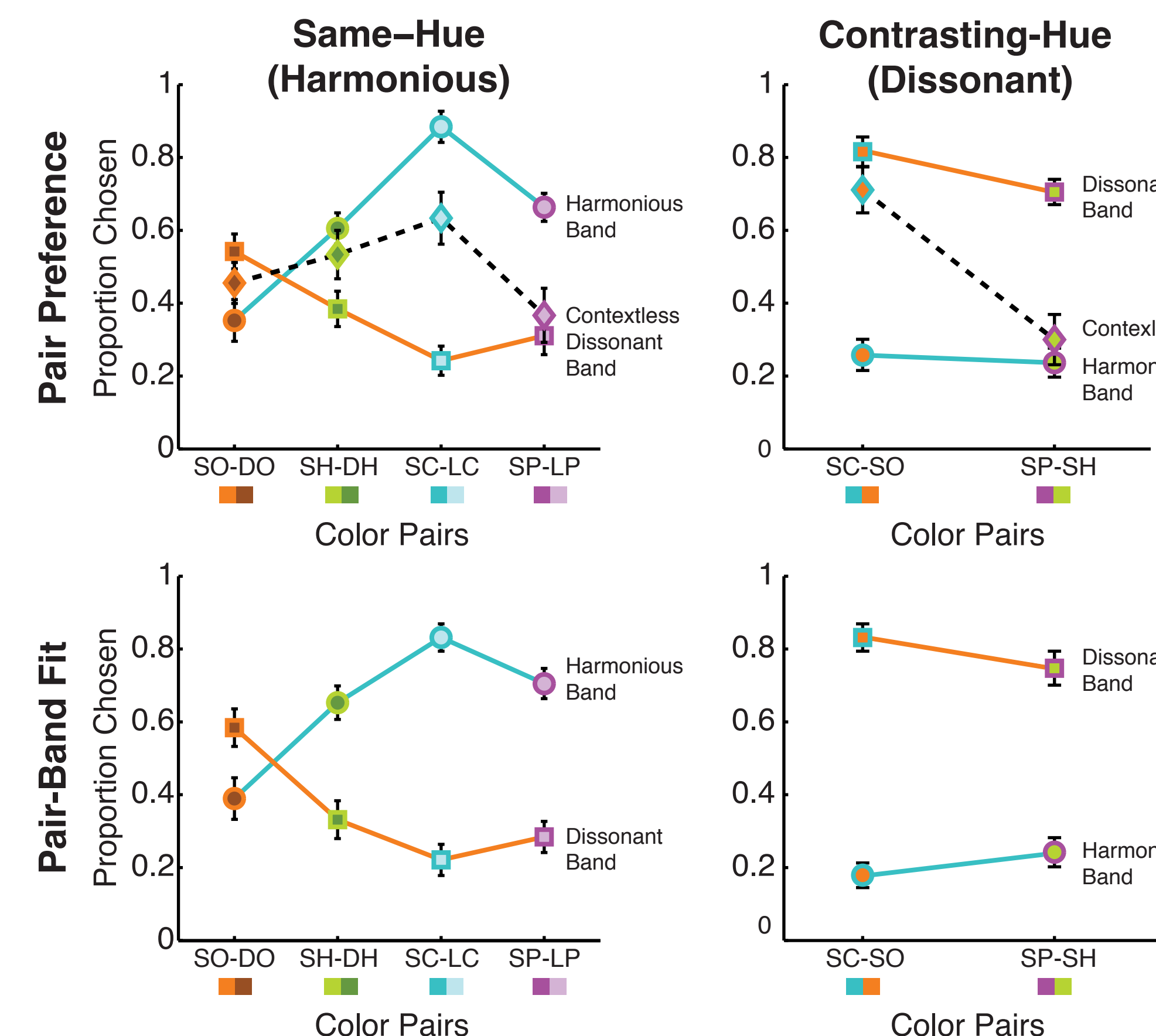2. the more preferred single color (of 2)

8 Single Colors

SO SH SC SP
DO DH LC LP

6 Color Pairs

SO - DO, SH - DH, SC - LC, SP - LP
SO - SC, SH - SP

Color Preferences Depend on Context

Same-Hue (Harmonious) — Pair Preference — Contrasting-Hue (Dissonant)
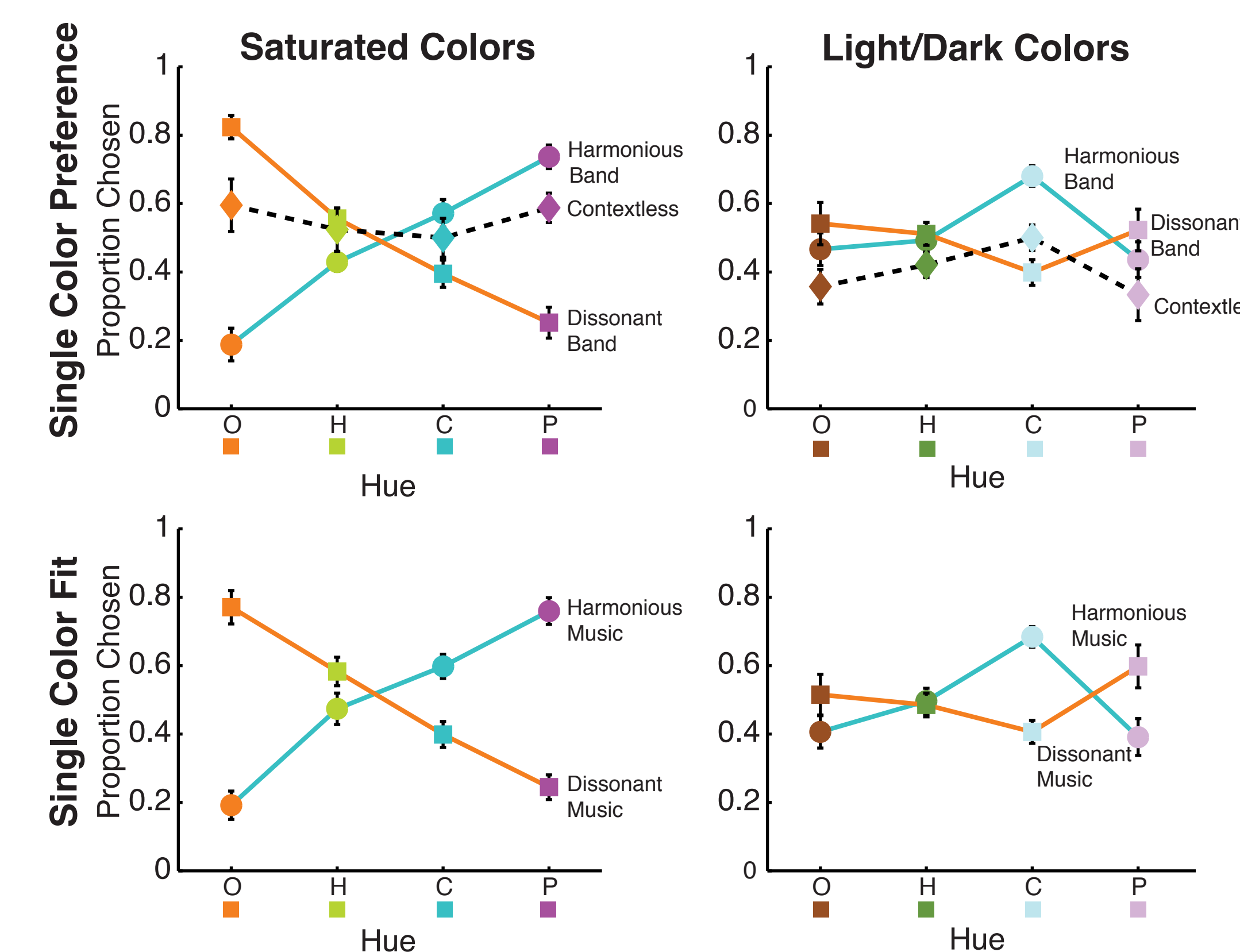
Pair-Band Fit

Color Pair Preferences

People choose color pairs that "fit well" with the band in consideration. These choices differ from contextless preference choices (dashed lines).

Pair preference and pair harmony were positively correlated for harmonious bands (r = +.76) and a negatively correlated for dissonant bands (r = -.85).

90% of the variance in 24 pair preference choices for bands is explained by pair-band fit choices (r = +.95).

Saturated Colors — Single Color Preference — Light/Dark Colors

Single Color Fit

Single Color Preferences

Cyan and purple were more preferred for (and fit better with) harmonious bands, whereas orange and chartreuse were more preferred (and fit better with) dissonant bands.

Similar to color pairs, people prefer single colors that "fit well" with the band in consideration, accounting for 90% of the variance (r = +0.95).

Experiment 2: Between-Participant Replication

Are the results of Experiment 1 due to demand characteristics (i.e., responses tailored to inferred hypotheses)?

Tested by repeating Experiment 1, but with each of 4 groups of participants providing data for only one band.

The results are very similar to Exp. 1's (r = +.83, +.74, for single colors and pairs, respectively): participants chose colors that best "fit" the band (r = +.81, +.92 for single colors and pairs).
∴ Demand effects are unlikely.

Same-Hue (Harmonious) — Pair Preference — Contrasting-Hue (Dissonant)

Pair Fit
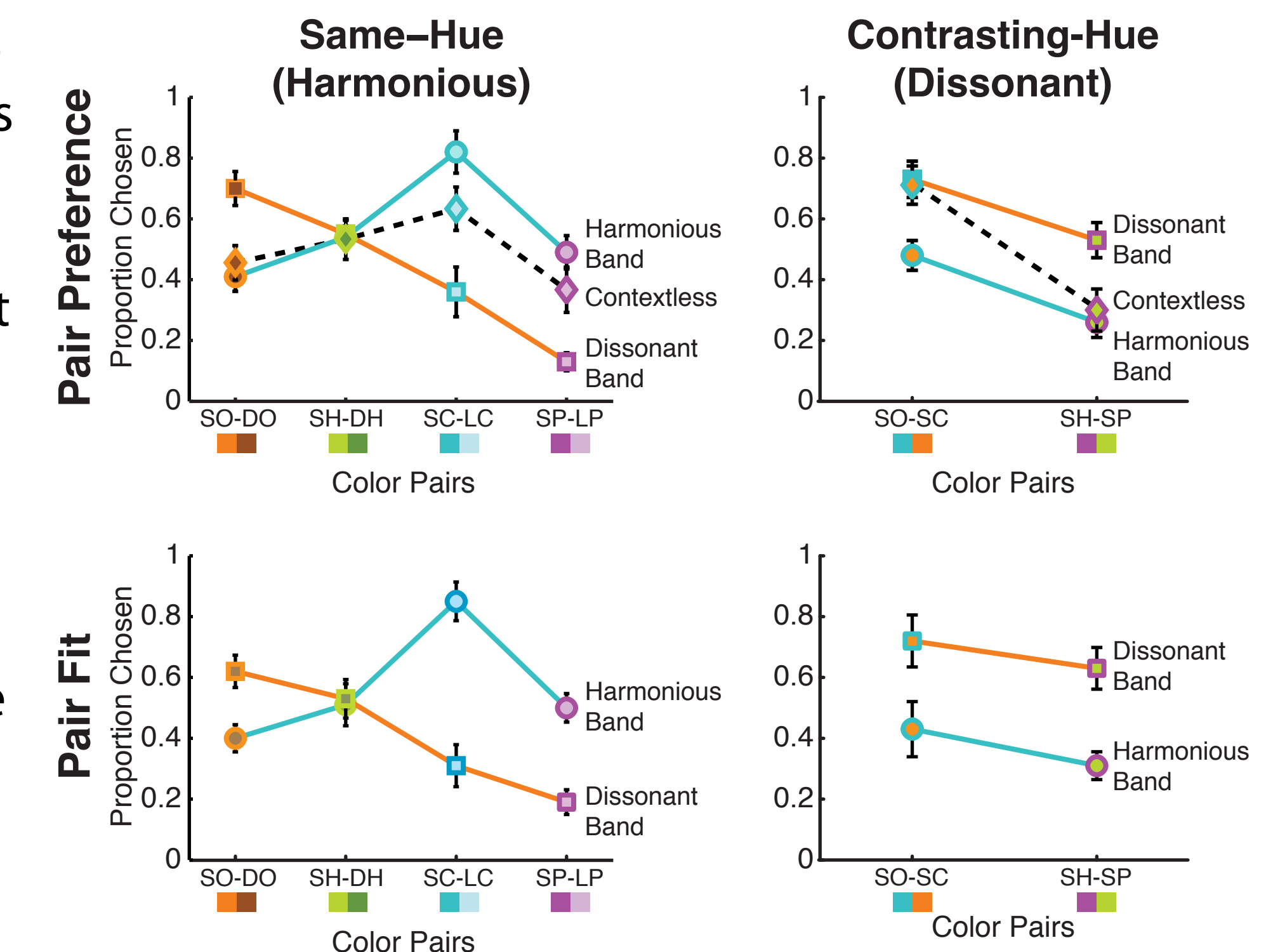
Summary and Conclusions

Similar to preferences for spatial composition (Sammartino & Palmer, submitted), color preferences change depending on semantic context.

Fit between semantic and visual content influences overriding contextless preference ratings.

Possible Explanations:

Preference for Second-order Harmony. People seem to prefer color combinations that "go well with" (i.e., are harmonious with) the music, even when this implies dissonant color combinations to go with dissonant bands.

Fluency. Perhaps people prefer color combinations that fit well with the music because congruency makes multimodal stimuli easier to process.

"Dead Last" "Frontrunner"

"Chaos" "Peace"

References and Acknowledgments

Palmer, S. E., Gardner, J. S., & Wickens, T. D. (2008). Aesthetic issues in spatial composition: Effects of position and direction on framing single objects. *Spatial Vision*. 21, 421–449.

Reber, R., Schwarz, N., & Winkielman, P. (2004). Processing fluency and aesthetic pleasure: Is beauty in the perceiver's processing experience? *Personality and Social Psychology Review*, 8, 364-382.

Sammartino, J. & Palmer, S. E. (submitted) Aesthetic issues in spatial composition: Representational fit and the role of semantic context.

Schloss, K. B., & Palmer, S. E. (2011). Aesthetic response to color combinations: preference, harmony, and similarity. *Attention, Perception & Psychophysics*, 73, 551-571.