Perceptual Similarities Among Wallpaper Group Exemplars

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**Abstract**

There exists an abundance of visual symmetry within our environment. Yet

research on human perception has almost exclusively been limited to studies of a single

type of symmetry— two-fold reflection—leaving uncertainty about human perceptual

sensitivity to the other types of symmetry as derived from the mathematics of Group

Theory. Clarke et al. (2011) found that five of the seventeen wallpaper groups—P1,

P3M1, P31M, P6, and P6M—have a high degree of self-similarity, as determined by the

frequency with which participants grouped random-dot noise representations of the same

wallpaper group together. The current study attempts to replicate Clarke et al. (2011) in a

limited form. Here, we sought to understand the salience of lower-order features within

each of five wallpaper groups, and concordantly, their impact on symmetry detection.

Adult participants were presented with twenty exemplars of each of the five

aforementioned wallpaper groups and instructed to sort them into as many subsets as they

wished based on any criteria they saw appropriate. Participants were then surveyed on the

methods they used to classify these images. Analysis suggest several factors—including

contrast and presence of salient secondary structures—influence the detection of

symmetry in wallpaper groups.

**Introduction**

**Methods**

*Participants*

*Stimuli*

**Results**

**Discussion**

**References**