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Unfolding Structure in the Drawings of Cubes

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Abstract

Recent work using neural networks and crowd-sourced perceptual judgements has shown that human figure drawings contain latent structure that can predict many characteristics of the artist including parent-reported motor function and perceived gender. We extend these approaches to two-dimensional renderings of three-dimensional cubes, assessing whether latent structure in these cube drawings likewise predicts demographic characteristics and motor function measured via a paper-folding task. Drawings produced with marker and paper showed a large predictive relationship with paper-folding (accounting for 59% of the offset variance, 62% of the angle variance, p s < .01). We also observed a complex interaction with gender: better cube-drawings predicted better paper-folding for male-identifying participants, but this relationship was reversed for female-identifying participants, who demonstrated better paper folding abilities overall. The results suggest that cube drawings contain richer structure than previously recognized and can provide a useful nonverbal metric for characterizing aspects of cognitive and motor abilities.