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Title

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Journal

Proceedings of the Annual Meeting of the Cognitive Science Society, 48(0)

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Publication Date

2026

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Peer reviewed

When Motion Wins: Hierarchies of Cognitive Efficiency in Perceptual Grouping

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Abstract

Decision-making benefits from efficient perceptual organization of cues minimize processing costs. This motivated the present examination of cognitive efficiency of competing Gestalt principles in digital natives by measuring both choice preferences and reaction times. 46 participants (25 males, Mean age-22.76 years) completed a web-based experiment consisting of five binary classification tasks, where ‘Common Fate’ competed against ‘Similarity’, ‘Proximity’, ‘Closure’, ‘Good Continuity’, & ‘Prägnanz’. Binomial tests revealed that Common Fate was selected above chance overall, but its dominance was hierarchical, strongest against ‘Prägnanz’ (91.3%) and weakest against ‘Similarity’ (65.2%). Our findings suggest that motion-based grouping appears computationally efficient for digital natives, but is graded and shaped by cue conflict. We propose an *efficiency-hierarchy model* where perceptual organization functions as a cost-sensitive competitive system based on selection frequency and resolution cost, and conjecture that increased selection probability for ‘Common Fate’ is linked to recalibration of perceptual priors in digital natives.