

Conceptual Combination Modulated by Action using Tangible Computers

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Abstract: We studied the role of action in a conceptual combination task by varying whether word stimuli could be physically grasped and arranged (words displayed individually on tangible cubes) or only touched and pointed to (words printed on a poster paper). Middle-school aged participants combined nouns from different taxonomic categories then described creative meanings. Descriptions contained more between-category relations (e.g., “shaped like” and “looks like” analogies) in the poster condition than when combining words using cubes. Conversely, participants produced more within-category descriptions (e.g., taxonomic declarations “it’s a X”, and metaphorically blended categories) when interacting with cubes than with a poster. These results suggest embodied explanations, and are consistent with developmental studies that find categorization is differentially organized by shape and taxonomy. We propose that hardcopy and traditional keyboard-display computers which afford pointing and touching may engage categorization differently than tangible computers based on physical objects which afford grasping and arranging.