BRIEF SUMMARY

Previous research indicates that dissociable neural subsystems underlie abstract-category (AC) recognition and priming of objects (e.g., cat, piano) and specific-exemplar (SE) recognition and priming of objects (e.g., a calico cat, a different calico cat, a grand piano, etc.). However, the degree of separability between these subsystems is not known, despite the importance of this issue for assessing relevant theories. Visual object representations are widely distributed in visual cortex, thus a multivariate pattern analysis (MVPA) approach to analyzing functional magnetic resonance imaging (fMRI) data may be critical for assessing the separability of different kinds of visual object processing. Here we examined the neural representations of visual object categories and visual object exemplars using multi-voxel pattern analyses of brain activity elicited in visual object processing areas during a repetition-priming task. In the encoding phase, participants viewed visual objects and the printed names of other objects. In the subsequent test phase, participants identified objects that were either same-exemplar primed, different-exemplar primed, word-primed, or unprimed. In visual object processing areas, classifiers were trained to distinguish same-exemplar primed objects from word-primed objects. Then, the abilities of these classifiers to discriminate different-exemplar primed objects and word-primed objects (reflecting AC priming) and to discriminate same-exemplar primed objects and different-exemplar primed objects (reflecting SE priming) was assessed. Results indicated that (a) repetition priming in occipital-temporal regions is organized asymmetrically, such that AC priming is more prevalent in the left hemisphere and SE priming is more prevalent in the right hemisphere, and (b) AC and SE subsystems are weakly modular, not strongly modular or unified.

*KEYWORDS:* fMRI, MVPA, repetition priming, object identification, category exemplar