

Is a Cow Mug a Cow or a mug? Object Appearance, but Not Semantics, is Represented in the Human Category-Selective Cortex

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Presentation Abstract Summary A fundamental question that cognitive neuroscience has yet to answer is what drives category-selective visual cortex organization: object visual properties or object semantic properties? Here we compiled a stimulus set that included 9 different triads containing one animate object (e.g., a cow), one inanimate object (e.g., a mug), and then, crucially, one inanimate object that looked like the animate object (e.g., a cow mug). Neuroimaging data was acquired in 16 subjects by means of an event-related design and multi-voxel patterns were analyzed for all 27 images. Results revealed activity patterns of inanimate objects that look like animate entities were significantly closer to animals as compared to objects. The surprising nature of this finding is enhanced by the fact that (1) deep neural networks, (2) human overall similarity judgments, and (3) task requirements during scanning showed the opposite pattern: a clear separation between the animate and inanimate category. In conclusion, these results suggest that object visual properties such as object look-like explain, better than semantics, ventral visual cortex category-based organization.

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