

Face and Word Processing: Two Sides of the Same Brain

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With the explosive growth of neuroimaging in recent years, theorizing within cognitive neuroscience has increasingly moved away from a search for domain-general principles toward a view in which the brain mechanisms supporting cognition are organized into distinct modules dedicated to narrowly-defined functions. A clear case in point concerns visual recognition of faces and words, where neuroimaging observations of selective activation for faces in the fusiform face area (FFA), and for words in the visual word form area (VWFA), dovetail with classic neuropsychological findings of selective deficits in face recognition (prosopagnosia) and in word recognition (pure alexia) following damage to these areas. The current research examines and elaborates an alternative perspective---that cognitive behavior is supported, not by dedicated modules, but by a highly distributed and interactive cortical network whose

organization is strongly shaped by experience. On this view, the functional specialization of brain regions is graded rather than absolute and reflects the consequences of a set of general principles and constraints on neural computation. The consequences of these principles go beyond explaining why neither pure alexia nor prosopagnosia is entirely pure, and why the FFA and VWFA show substantial responses to stimuli other than faces or words, respectively. They also lead to otherwise unexpected predictions---tested in the current work with a combination of computational and empirical studies---concerning the partial co-mingling of face and word processing, including face recognition impairments in pure alexic patients, word recognition impairments in prosopagnosic individuals, and graded participation of the FFA and VWFA in normal observers.