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# Dissociations between faces and words: comment on Behrmann and Plaut

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Behrmann and Plaut recently proposed a 'many-to-many' model of visual recognition [1]. According to the model, visual recognition is carried out by a distributed network of cortical mechanisms that are not specialized for particular categories, but rather are involved to some extent in processing many categories. As primary support for the model, Behrmann and Plaut claim that, whereas face recognition is predominantly right-lateralized and word recognition left-lateralized, faces and words are processed by non-independent, overlapping mechanisms. We fully agree with the authors (and others) that faces and words are each processed by a network of cortical regions [2,3]. However, contrary to Behrmann and Plaut, we suggest that at least some of the mechanisms processing faces and words are independent, as particularly indicated by the double dissociation between face and word recognition in neuropsychological cases.

Behrmann and Plaut's 'many-to-many' model makes a straightforward prediction, namely, that individuals with prosopagnosia will always have some deficits in word recognition, whereas individuals with alexia will always have some deficits in face recognition [1,4]. Consistent with this prediction, Behrmann and Plaut cite a recent group study in which face and word recognition deficits co-occurred in seven cases [4]. However, they do not discuss cases that appear inconsistent with this prediction. For example, in a seminal 1991 review of visual agnosia [5], Farah identified 58 cases in which face and word recognition dissociated (42 cases of prosopagnosia without alexia and 16 cases of alexia without prosopagnosia).

More cases exhibiting dissociation between face and word recognition have been reported since Farah's review [6–8]. Perhaps the clearest example is the case of CK, who suffered from severe object agnosia and alexia due to a closed-head injury that led to a suggestion of bilateral occipital lobe thinning [6]. CK was tested with multiple tasks of letter and word processing, including discrimination of letters from their mirror reversals, matching of cross-case letters, recognition of single letters, and reading single words aloud. Consistent with his inability to read, CK performed at or nearly at chance on all tasks, indicative of profound alexia [9]. Yet, CK showed no face recognition deficits, as demonstrated extensively in a later report [10].

The neuropsychological cases that exhibit prosopagnosia without word recognition deficits and alexia without face recognition deficits suggest that face and word recognition rely, at least in part, on independent mechanisms. These cases constitute a challenge that needs to be addressed by the 'many-to-many' model.

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