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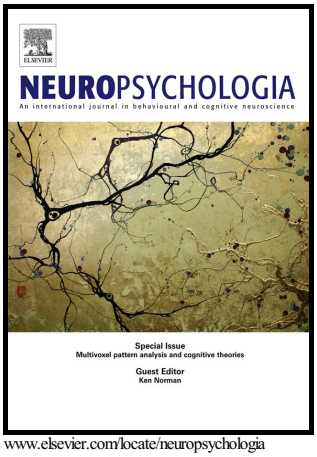

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PII: S0028-3932(18)30453-6
DOI: https://doi.org/10.1016/j.neuropsychologia.2018.09.011
Reference: NSY6915

To appear in: *Neuropsychologia*

Received date: 3 August 2018
Revised date: 18 September 2018
Accepted date: 19 September 2018

Cite this article as: Zachary Mineroff, Idan Asher Blank, Kyle Mahowald and Evelina Fedorenko, A robust dissociation among the language, multiple demand, and default mode networks: Evidence from inter-region correlations in effect size, *Neuropsychologia,* https://doi.org/10.1016/j.neuropsychologia.2018.09.011

A robust dissociation among the language, multiple demand, and default mode networks: evidence from inter-region correlations in effect size

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Abstract

Complex cognitive processes, including language, rely on multiple mental operations that are carried out by several large-scale functional networks in the frontal, temporal, and parietal association cortices of the human brain. The central division of cognitive labor is between two fronto-parietal bilateral networks: (a) the multiple demand (MD) network, which supports executive processes, such as working memory and cognitive control, and is engaged by diverse task domains, including language, especially when comprehension gets difficult; and (b) the default mode network (DMN), which supports introspective processes, such as mind wandering, and is active when we are not engaged in processing external stimuli. These two networks are strongly dissociated in both their functional profiles and their patterns of activity fluctuations during naturalistic cognition. Here, we focus on the functional relationship between these two networks and a third network: (c) the fronto-temporal left-lateralized "core" language network, which is selectively recruited by linguistic processing. Is the language network distinct and dissociated from both the MD network and the DMN, or is it synchronized and integrated with one or both of them? Recent work has provided evidence for a dissociation between the language network and the MD network. However, the relationship between the language network and the