

Resting state networks (RSNs) show spatial patterns generally consistent with **networks** revealed during **cognitive tasks**. However, the exact degree of overlap between these networks has not been clearly quantified. Such an investigation shows promise for decoding altered **functional connectivity** (FC) related to abnormal language functioning in clinical populations such as **temporal lobe epilepsy** (TLE). In this context, we investigated the network configurations during a language task and during resting state using FC. Twenty-four healthy controls, 24 right and 24 left TLE patients completed a verb generation (VG) task and a resting-state fMRI scan. We compared the language network revealed by the VG task with three FC-based networks (seeding the left inferior frontal cortex (IFC)/Broca): two from the task (ON, OFF blocks) and one from the resting state. We found that, for both left TLE patients and controls, the RSN recruited regions bilaterally, whereas both VG-on and VG-off conditions produced more left-lateralized FC networks, matching more closely with the activated language network. TLE brings with it variability in both task-dependent and task-independent networks, reflective of atypical language organization. Overall, our findings suggest that our RSN captured bilateral activity, reflecting a set of prepotent language regions. We propose that this relationship can be best understood by the notion of pruning or winnowing down of the larger language-ready RSN to carry out specific task demands. Our data suggest that multiple types of network analyses may be needed to decode the association between language deficits and the underlying functional mechanisms altered by disease ¹⁾.

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Doucet GE, He X, Sperling MR, Sharan A, Tracy JI. From “rest” to language task: Task activation selects and prunes from broader resting-state network. Hum Brain Mapp. 2017 Feb 14. doi: 10.1002/hbm.23539. [Epub ahead of print] PubMed PMID: 28195438.

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