During spoken sentence comprehension we construct online syntactic representations as the speech is heard (Marsolek & Tyler, 1980).

When syntactic structure is ambiguous and incompatible with the context, the syntactic representation must be reanalyzed.

Previous work shows that syntactic ambiguity and reanalysis involves a left hemisphere network of LIFG, LpMTG and the white matter tracts connecting them (Tyler et al., 2011, Griffs and Popp, 2013).

In our previous magnetoencephalography (MEG) study using local syntactic ambiguities we separated out the effects of ambiguity from reanalysis (Tyler et al., 2013).

Hierarchical Bayesian model selection: The results of each family comparison were used to restrict the model space in the following family comparison.

In the circus juggling knives...

Data Analysis
• 306-channel MEG
• Band pass filtered between 0.5-100 Hz
• 200 ms to 1000 ms peristimulus epoch from the onset of the disambiguating verb (e.g. “knife...
• Epochs averaged by trials
• Minimum norm source localization using SPM8
• Virtual channel MNI coordinates defined using the results of our previous MEG study with same paradigm: LH, LpMTG and LIFG.

Hierarchical Bayesian model selection: The results of each family comparison were used to restrict the model space in the following family comparison.

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• Even though the syntactic network is defined, it is still unclear how the regions within this network communicate and modulate each other.

• Here we focus on syntactic reanalysis. We ask how the effective connectivity within the left frontotemporal syntactic network is modulated during spoken sentence comprehension and syntactic reanalysis.

• Sentences included local syntactic ambiguities (e.g. “juggling knives...”) to probe syntactic processing.

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• We looked at changes in coupling gains of connections within the network, from the onset of disambiguation verb using MEG and dynamic causal modeling for ERPs (DCM-ERP).

• We predicted that the reactivation of the less preferred reading and the reanalysis of the syntactic structure would require re-entrant activity in LpMTG driven by top-down signals from the LIFG (Tyler et al., 2013; Papoutsis et al., 2011).

Results from the onset of disambiguation verb
• First family comparison showed that M1 and M2 model architectures did not significantly differ (P>0.05) in their explained data in all three contrasts. The number of models compared in each contrast is given within brackets.

• Second family comparison showed that in all three contrasts the models that had modulations in both forward and backward connections had higher model evidence.

• Third family comparison revealed that these forward and backward modulations were taking place in two sites: between LHG and LpMTG, and between LpMTG and LIFG.

• The nonparametric proportion test revealed that the connections below were significantly (P<0.05) modulated for the following contrasts. The significant decreases and increases in coupling gains are displayed in blue and orange respectively.

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