eAppendix 1. Resection Mask Reliability and Validation

eIntroduction

Core to our methodology is accurate resection mask delineation. In order to assess the resection masks validity, we performed interrater reliability assessments based upon 2 raters performed at different times using the same methodology. Stability of our results was based upon dilation of the resection mask. If our results are resection-mask delineation dependent, we should expect to see little correlation with dilation. If our results hold stable in the presence of dilation, this suggests that our results are reliable across any delineation errors.

eMethod

Reliability Assessments

To assess the reliability of our results, resection masks and volumes were compared between two raters. Resection mask volume of each mask was extracted and we performed two statistical assessments: a two-tailed Pearson's correlation and a consistency two-way mixed intraclass correlation coefficient.

Stability Assessment

To investigate the effects of resection mask size on resected volume, we dilated the resection mask up to 3 mm. An MM robust regression was done at each dilation to assess if results held stable across resection mask size increases.

eResults

Reliability

All resection masks used in the main manuscript were performed by Rater 1. Rater 2 delineated of a subset of 51 resection masks (26 language dominant, 25 langauge non-dominant). Mean and standard deviation of resection volumes are shown in eTable 2. We found a strong significant correlation between resection volume between raters, $r(51) = 0.889$, $p < 0.001$. We also found a strong consistency between the raters: the intraclass correlation coefficient was 0.941 with a 95% confidence interval from 0.896 to 0.966 ($F(50,50)=16.834$, $p < 0.001$).

eTable 1. Mean and standard deviation between the overlap of 51 cases drawn by two raters.

Features	*Rater 1*	*Rater 2*
Mean (standard deviation)	32.57 (7.70)	36.71 (8.04)

Stability

Language Dominant Hemisphere

For the inferior frontal sub-fasciculus of the IFOF relationship to picture naming at 3 months, we saw a minor effect of delineation with the model remaining significant for dilations of 1 mm (eTable 3). Given the close proximity of the IFOF to the resection and the small cross-section of the bundle at the temporal stem here, even minimal dilation would quickly impact the percentage of IFOF cut by a huge amount. This is represented in the pronounced change from 1 mm to 2 mm dilation, demonstrating the importance of our reliable resection delineation.

Language Non-dominant Hemisphere

For the anterior sub-fasciculus of the MLF relationship to picture naming at 3 months, we saw no effect of delineation with the model remaining significant across dilations (see eTable 3).

eTable 2. A table showing the impact of resection mask dilation on individual coefficients.

Assessment	*Variables*	*Resection Mask Dilations*	*Coefficient Significance*	*Model Significance*
Language Dominant Hemisphere – Picture Naming 3 months	*IFG-IFOF*	*1*	*0.020**	*0.015**
		2	*0.151*	*0.144*
		3	*0.368*	*0.363*
Language Non-dominant Hemisphere– Picture Naming 3 months	*Anterior MLF*	*1*	*0.007**	*0.005**
		2	*0.008**	*0.005**
		3	*0.007**	*0.005**