

| WAB-R Score | Omnibus Test | Laterality | Parameter Estimates | | | 95% Wald CI | | Hypothesis Test | | | |
|----------------------|------------------------|----------------------|--|------------------------|-------------------|---|--------------|-----------------|--------------|--------------|------------|
| | | | Parameter | β | Std. Error | Lower | Upper | Wald χ^2 | p | | |
| Aphasia Quotient | AIC = 252 BIC = 264 | | $X^2(6, N = 48) = 31.07$, p = .001 | (Intercept) | 91.51 | 7.81 | 76.20 | 106.83 | 137.17 | .00 | |
| | | | Lesion Volume | -.11 | .02 | -.15 | -.06 | 21.52 | .00 | | |
| | | | AOS Severity | -5.03 | 1.73 | -8.43 | -1.64 | 8.43 | .01 | | |
| | | | Both groups | B | lPP-rPP | 16.37 | 1.23 | -3.67 | 36.41 | 2.56 | .15 |
| | | | Both groups | R | rpMTG-rIFG | -25.60 | 8.82 | -42.89 | -8.31 | 8.42 | .01 |
| | | | Both groups | B | lPM-rPM | -9.36 | 8.10 | -25.24 | 6.51 | 1.34 | .25 |
| | | | | | | 11.2 | | | | | |
| | | | Both groups | B | lsITG-rMFG | 12.88 | 0 | -9.09 | 34.84 | 1.32 | .25 |
| | | | 157.6 | | | | | | | | |
| | | | (Scale) | 4 | 4.70 | 95.04 | 261.49 | | | | |
| Spontaneous Speech | AIC = 166 BIC = 183 | | $X^2(10, N = 48) = 36.61$, p < .0001 | (Intercept) | 16.92 | 2.67 | 11.68 | 22.16 | 4.03 | .00 | |
| | | | Lesion Volume | -.03 | .01 | -.04 | -.01 | 12.67 | .00 | | |
| | | | AOS Severity | -.49 | .40 | -1.27 | .30 | 1.48 | .27 | | |
| | | | Gender | .06 | 1.50 | -2.88 | 2.99 | .00 | .97 | | |
| | | | Both groups | B | lPM-rPM | 2.63 | 2.60 | -2.46 | 7.72 | 1.03 | .34 |
| | | | Both groups | R | rsITG-rMFG | -4.07 | 2.57 | -9.11 | .97 | 2.51 | .21 |
| | | | PWA only | R | rPM-rIFG | -3.10 | 1.74 | -6.51 | .31 | 3.18 | .16 |
| | | | PWA only | B | lIFG-rMFG | -7.55 | 4.11 | -15.60 | .51 | 3.38 | .16 |
| | | | Both groups | B | lMFG-rMFG | 3.93 | 2.91 | -1.78 | 9.64 | 1.82 | .27 |
| | | | Both groups | B | lPP-rPP | 2.23 | 1.77 | -1.25 | 5.70 | 1.58 | .27 |
| | | | Both groups | R | rpMTG-rIFG | -4.36 | 2.27 | -8.80 | .09 | 3.69 | .16 |
| | | | | | (Scale) | 6.68 | 1.72 | 4.03 | 11.08 | | |
| | | | Content | AIC = 131 BIC = 143 | | $X^2(7, N = 48) = 32.14$, p < .0001 | (Intercept) | 3.27 | 2.32 | -1.28 | 7.81 |
| Lesion Volume | -.02 | .01 | | | | -.03 | -.01 | 21.78 | .00 | | |
| AOS Severity | -.77 | .18 | | | | -1.12 | -.43 | 19.43 | .00 | | |
| Age | .13 | .04 | | | | .05 | .22 | 9.10 | .01 | | |
| Both groups | B | lPM-rPM | | | | -1.83 | .98 | -3.75 | .10 | 3.46 | .10 |
| Both groups | R | rsITG-rMFG | | | | .80 | 1.08 | -1.32 | 2.93 | .55 | .46 |
| Both groups | B | lPP-rPP | | | | -1.72 | 1.39 | -4.45 | 1.00 | 1.54 | .24 |
| Both groups | B | latFusi-riITG | | | | 5.28 | 1.42 | 2.49 | 8.07 | 13.76 | .00 |
| | | (Scale) | 2.50 | .65 | 1.51 | 4.15 | | | | | |
| Fluency | AIC = 125 | | $X^2(10, N = 48) = 37.75$, p < .0001 | (Intercept) | 8.22 | 1.07 | 6.12 | 1.32 | 58.76 | .00 | |
| | | | Lesion Volume | -.01 | .00 | -.02 | .00 | 6.56 | .04 | | |

| | | | | | | | | | |
|-------------------------|--|----------|--|--------------|-------------|--------------|--------------|--------------|------------|
| BIC = 142 | | | AOS Severity | -.22 | .25 | -.71 | .27 | .75 | .42 |
| | | | Gender | .30 | 1.01 | -1.69 | 2.28 | .09 | .77 |
| Both groups | | B | IPM-rPM | 2.20 | 1.23 | -.21 | 4.61 | 3.20 | .13 |
| Both groups | | L | lpSMG_lAG | -1.25 | .88 | -2.97 | .47 | 2.04 | .21 |
| Both groups | | B | rsITG-IMFG | -5.04 | 1.46 | -7.89 | -2.18 | 11.92 | .01 |
| Both groups | | R | rsITG-rMFG | -2.93 | 1.27 | -5.43 | -.44 | 5.31 | .06 |
| PWA only | | R | rPM-rIFG | -1.24 | .93 | -3.07 | .59 | 1.75 | .23 |
| PWA only | | B | lIFG-rMFG | -3.76 | 1.93 | -7.54 | .02 | 3.81 | .11 |
| Both groups | | B | IMFG-rMFG | 3.19 | 1.88 | -.49 | 6.87 | 2.88 | .14 |
| | | | (Scale) | 1.72 | .44 | 1.04 | 2.85 | | |
| Auditory Comprehension | | | $X^2(5, N = 48) = 29.78,$ $p < .0001$ | | | | | | |
| AIC = 102 | | | (Intercept) | 7.10 | .63 | 5.87 | 8.33 | 128.08 | .00 |
| BIC = 111 | | | Lesion Volume | .00 | .00 | -.01 | .00 | 1.39 | .24 |
| Both groups | | B | IAG-rAG | 2.16 | .90 | .40 | 3.92 | 5.79 | .03 |
| Both groups | | L | IAG-lsITG | 2.19 | .69 | .85 | 3.54 | 1.19 | .00 |
| Both groups | | R | rpMTG-rIFG | -2.17 | 1.05 | -4.24 | -.11 | 4.25 | .06 |
| PWA only | | B | lpMTG-rsITG | 1.47 | .82 | -.13 | 3.08 | 3.23 | .09 |
| | | | (Scale) | 1.08 | .28 | .65 | 1.80 | | |
| Repetition | | | $X^2(3, N = 48) = 17.92,$ $p < .0001$ | | | | | | |
| AIC = 144 | | | (Intercept) | 9.93 | .61 | 8.73 | 11.13 | 263.52 | .00 |
| BIC = 151 | | | Lesion Volume | -.01 | .01 | -.02 | .01 | 1.14 | .29 |
| | | | AOS Severity | -.95 | .23 | -1.39 | -.50 | 17.36 | .00 |
| Both groups | | R | rsITG-rMFG | -1.84 | 1.03 | -3.87 | .18 | 3.19 | .10 |
| | | | (Scale) | 5.03 | 1.30 | 3.03 | 8.35 | | |
| Naming and Word Finding | | | $X^2(5, N = 48) = 33.96,$ $p < .0001$ | | | | | | |
| AIC = 123 | | | (Intercept) | 11.37 | .90 | 9.61 | 13.14 | 159.86 | .00 |
| BIC = 133 | | | Lesion Volume | -.02 | .00 | -.02 | -.01 | 26.70 | .00 |
| | | | AOS Severity | -.45 | .17 | -.79 | -.11 | 6.64 | .01 |
| Both groups | | R | rpMTG-rIFG | -3.66 | 1.23 | -6.08 | -1.25 | 8.82 | .00 |
| Both groups | | L | lIFG-IMFG | -4.28 | .87 | -5.98 | -2.58 | 24.31 | .00 |
| Both groups | | B | IPM-rPM | -.04 | 1.10 | -2.20 | 2.12 | .00 | .97 |
| | | | (Scale) | 2.23 | .58 | 1.35 | 3.70 | | |

Supplemental Material S4. Generalized linear model results for the first proposed model, based on the use of univariate linear models to identify potential predictors. Significant predictors are in **bold**. Model fit statistics (Akaike's Information Criterion [AIC] and Bayesian Information Criterion [BIC]) are provided for each model. Indicators of whether the functional connection was significant in both groups or the PWA group only, are provided in the column left of each potential predictor connection. The normal distribution produced the best fit model for all analyses.

Laterality: B = bilateral, R = right, L = left. AOS: apraxia of speech, l: left, r: right, sITG: superior inferior temporal gyrus, iITG: inferior inferior temporal gyrus, Fusi: fusiform gyrus, AG: angular gyrus, PP: planum polare, SMG: supramarginal gyrus, pMTG: posterior middle temporal gyrus, PM: premotor cortex, IFG: inferior frontal gyrus, MFG: middle frontal gyrus.