

S2 Table Significant p -values and direction of effects for post-hoc comparisons based on channel-specific ANOVA findings. We conducted a repeated-measures ANOVA and post-hoc analyses for channel-specific regional comparisons. The repeated-measures ANOVA of condition (Watch, Do, Together) x hemisphere (left, right) x channel assignment (MFG, IFG, STG, MTG, IPL) revealed main effects of condition ($F(1.9, 360.4) = 21.8, p < 0.001$) and channel ($F(3.5, 668.8) = 7.2, p < 0.001$), 2-way interactions of channel x group ($F(3.5, 668.8) = 14.8, P < 0.001$), condition x hemisphere ($F(1.9, 361.0) = 8.3, p < 0.001$), condition x channel ($F(6.5, 1265.0) = 5.9, p < 0.001$), and hemisphere x channel ($F(3.4, 666.6) = 4.5, p = 0.002$), 3-way interactions of hemisphere x channel x group interaction ($F(3.4, 666.6) = 6.1, p < 0.001$), and condition x hemisphere x channel ($F(7.0, 1352.2) = 4.1, p < 0.001$), as well as a four way interaction of condition x hemisphere x channel x group ($F(7.0, 1352.2) = 4.1, p < 0.001$). Note that the results of channel-specific ANOVA are similar to that of the overall regional ANOVA described in the main body of the paper. The results of post-hoc analyses are also similar and are listed in the table below.

Comparison	Significant p values	Direction of effect
Group differences		
Watch, Left MFG	0.011	ASD > TD ^a
Watch, Right IFG	0.017	TD > ASD ^a
Watch, Right STG	0.003	TD > ASD ^a
Do, Left STG	0.013	TD > ASD ^a
Do, Left MTG	0.028	TD > ASD ^b
Do, Right IFG	0.008	TD > ASD ^a
Do, Right STG	< 0.001	TD > ASD ^a
Do, Right MTG	0.027	TD > ASD ^b
Do, Right IPL	0.001	ASD > TD ^a
Together, Left MFG	0.017	ASD > TD ^a
Together, Left STG	< 0.001	TD > ASD ^a
Together, Right MFG	0.015	TD > ASD ^a
Together, Right IFG	0.009	TD > ASD ^a
Together, Right STG	0.034	TD > ASD ^b
Together, Right IPL	0.006	ASD > TD ^a
Conditional differences		
TD, Left MFG	< 0.001	D > W ^a
	< 0.001	T > W ^a
TD, Left IFG	< 0.001	D > W ^a
	0.013	T > W ^a
TD, Left STG	< 0.001	D > W ^a
	0.004	T > W ^a
TD, Left MTG	0.021	T > W ^b
TD, Left IPL	0.008	D > W ^a
	0.014	T > W ^a
TD, Right MFG	< 0.001	T > W ^a
	0.017	T > D ^a
TD, Right IFG	0.015	D > W ^a
TD, Right MTG	0.017	T > D ^a
TD, Right IPL	0.002	T > W ^a
	0.003	T > D ^a
ASD, Left MFG	0.003	D > W ^a
	< 0.001	T > W ^a
ASD, Left STG	0.024	D > W ^b
	0.020	W > T ^b

ASD, Left, IPL	< 0.001	D > T ^a
	< 0.001	D > W ^a
	< 0.001	T > W ^a
ASD, Right MTG	0.016	T > W ^a
	0.038	T > D ^b
ASD, Right IPL	0.009	D > W ^a
	< 0.001	T > W ^a
Hemispheric differences		
TD, Do, MTG	0.025	L > R ^b
TD, Do, MTG	0.006	L > R ^a
TD, Do, IPL	0.045	L > R ^b
ASD, Watch, IPL	0.031	R > L ^b
ASD, Do, MFG	< 0.001	L > R ^a
ASD, Do, MSTS	< 0.001	L > R ^a
ASD, Do, MTG	0.048	R > L ^b
ASD, Together, MFG	< 0.001	L > R ^a
ASD, Together, STG	0.009	R > L ^a
ASD, Together, IPL	0.012	R > L ^b