

Additional file 2 Formulas for the degrees of freedom, mean squares, and pseudo-F values in the Procrustes ANOVA models decomposing matching symmetry in LLS and ULS terminal lobules

LLS (lower lateral sublobe)

Source	Abbreviation	Df	MS	Pseudo-F ratio
Individual	ind	I-1	$SS_{ind}/I-1$	$MS_{ind}/MS_{lrt:bet:wlb(ind)}$
Left-right asymmetry (ind)	wit	I(J-1)	$SS_{lrt(ind)}/I(J-1)$	$MS_{lrt(ind)}/MS_{bet:wlb(ind)}$
Inter-semicell asymmetry (ind)	bet	I(J-1)	$SS_{bet(ind)}/I(J-1)$	$MS_{bet(ind)}/MS_{lrt:wlb(ind)}$
Transversal asymmetry (ind)	trn	I(J-1)	$SS_{trn(ind)}/I(J-1)$	$MS_{trn(ind)}/MS_{bet:wlb(ind)}$
Intra-lobe asymmetry (ind)	wlb	I(J-1)	$SS_{wlb(ind)}/I(J-1)$	$MS_{wlb(ind)}/MS_{bet:lrt(ind)}$
Intra-lobe and Left-right (ind)	wwt	I(J-1)	$SS_{wlt(ind)}/I(J-1)$	$MS_{wlt(ind)}/MS_{bet:lrt(ind)}$
Intra-lobe and Inter-semicell (ind)	wbt	I(J-1)	$SS_{wbt(ind)}/I(J-1)$	$MS_{wbt(ind)}/MS_{bet:lrt(ind)}$
Intra- lobe and Transversal (ind)	wtr	I(J-1)	$SS_{wtr(ind)}/I(J-1)$	$MS_{wtr(ind)}/MS_{bet:lrt(ind)}$
Measurement error	mre	$IJ^3(r-1)$	$SS_{mre}/IJ^3(r-1)$	
Total		IJ^3r-1		

ULS (upper lateral sublobe)

Source	Abbrev.	Df	MS	Pseudo-F ratio
Individual	ind	I-1	$SS_{ind}/I-1$	$MS_{ind}/MS_{lrt:bet:blb:wlb(ind)}$
Left-right asymmetry (ind)	lrt	I(J-1)	$SS_{lrt(ind)}/I(J-1)$	$MS_{lrt(ind)}/MS_{bet:blb:wlb(ind)}$
Inter-semicell asymmetry (ind)	bet	I(J-1)	$SS_{bet(ind)}/I(J-1)$	$MS_{bet(ind)}/MS_{lrt:blb:wlb(ind)}$
Transversal asymmetry (ind)	trn	I(J-1)	$SS_{trn(ind)}/I(J-1)$	$MS_{trn(ind)}/MS_{bet:blb:wlb(ind)}$
Inter-3 rd -order-lobules asymmetry (ind)	blb	I(J-1)	$SS_{blb(ind)}/I(J-1)$	$MS_{blb(ind)}/MS_{bet:lrt:wlb(ind)}$
Inter-3 rd -order-lobules and Left-right (ind)	bll	I(J-1)	$SS_{bll(ind)}/I(J-1)$	$MS_{bll(ind)}/MS_{lrt:bet:wlb(ind)}$
Inter-3 rd -order-lobules and Inter-semicell (ind)	bbl	I(J-1)	$SS_{bbl(ind)}/I(J-1)$	$MS_{bbl(ind)}/MS_{lrt:bet:wlb(ind)}$
Inter-3 rd -order-lobules and Transversal (ind)	btr	I(J-1)	$SS_{btr(ind)}/I(J-1)$	$MS_{btr(ind)}/MS_{lrt:bet:wlb(ind)}$
Intra-3 rd -order-lobules asymmetry – type I (ind)	wlb	I(J-1)	$SS_{wlb(ind)}/I(J-1)$	$MS_{wlb(ind)}/MS_{bet:lrt:blb(ind)}$
Intra-3 rd -order-lobules – type I and Left-right (ind)	wlr	I(J-1)	$SS_{wlr(ind)}/I(J-1)$	$MS_{wlr(ind)}/MS_{lrt:bet:blb(ind)}$
Intra-3 rd -order-lobules – type I and Inter-semicell (ind)	wbl	I(J-1)	$SS_{wbl(ind)}/I(J-1)$	$MS_{wbl(ind)}/MS_{lrt:bet:blb(ind)}$
Intra-3 rd -order-lobules – type I and Transversal (ind)	wtr	I(J-1)	$SS_{wtr(ind)}/I(J-1)$	$MS_{wtr(ind)}/MS_{lrt:bet:blb(ind)}$
Intra-3 rd -order-lobules asymmetry - type II (ind)	blw	I(J-1)	$SS_{blw(ind)}/I(J-1)$	$MS_{blw(ind)}/MS_{lrt:bet:wlb(ind)}$
Intra-3 rd -order-lobules – type II and Left-right (ind)	bwl	I(J-1)	$SS_{bwl(ind)}/I(J-1)$	$MS_{bwl(ind)}/MS_{lrt:bet:wlb(ind)}$
Intra-3 rd -order-lobules – type II and Inter-semicell (ind)	bwb	I(J-1)	$SS_{bwb(ind)}/I(J-1)$	$MS_{bwb(ind)}/MS_{lrt:bet:wlb(ind)}$
Intra-3 rd -order-lobules – type II and Transversal (ind)	bwt	I(J-1)	$SS_{bwt(ind)}/I(J-1)$	$MS_{bwt(ind)}/MS_{lrt:bet:wlb(ind)}$
Measurement error		$IJ^4(-1)$	$SS_{mre}/IJ^4(r-1)$	
Total		IJ^4r-1		

I – number of individuals (I=68), J – number of levels in the asymmetric effects (J=2), r – number of repetitions (r=2)