On prediction of aided behavioural measures using Speech Auditory Brainstem Responses and Decision Trees

Supporting Information
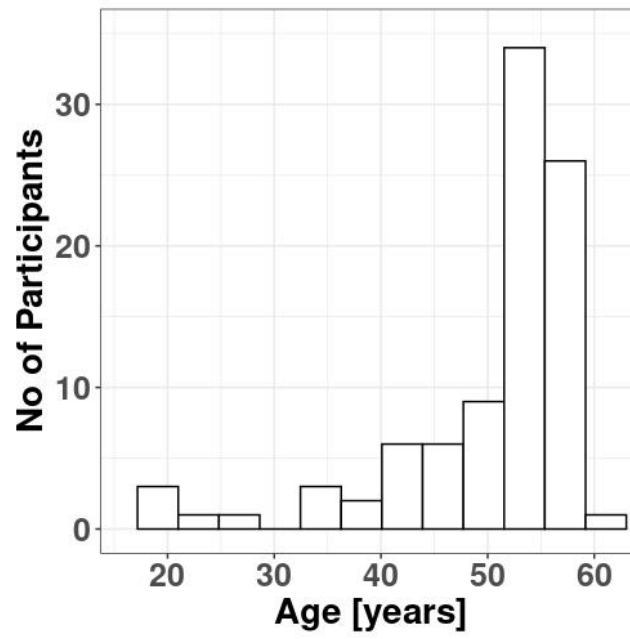
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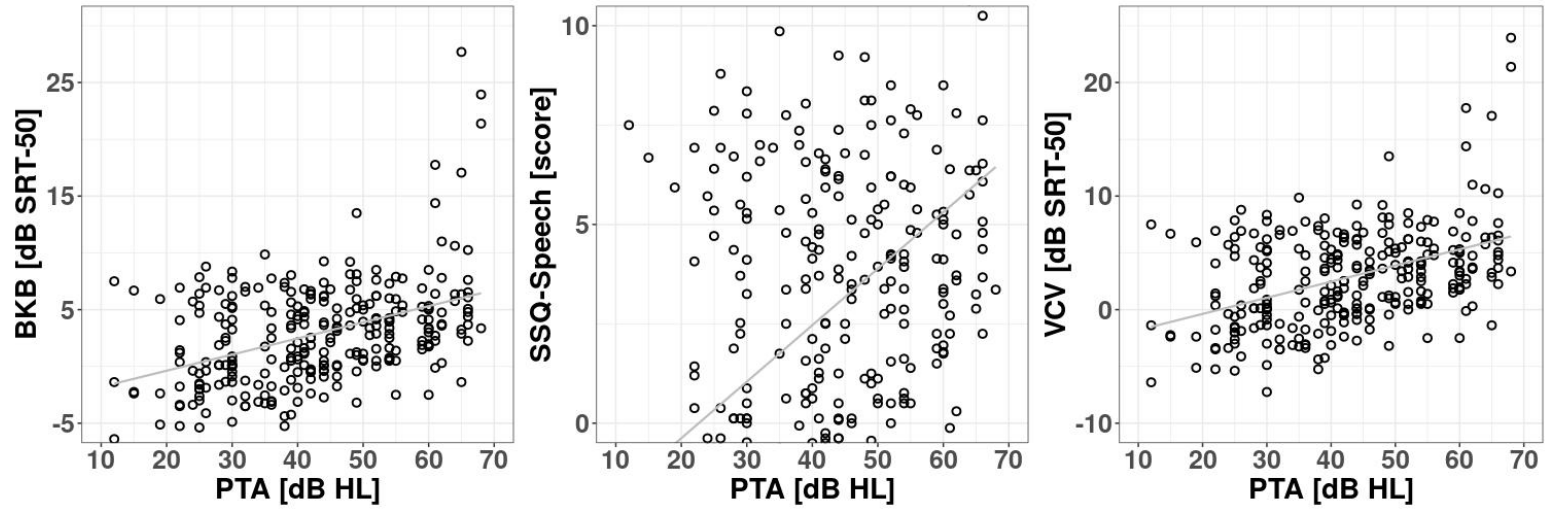
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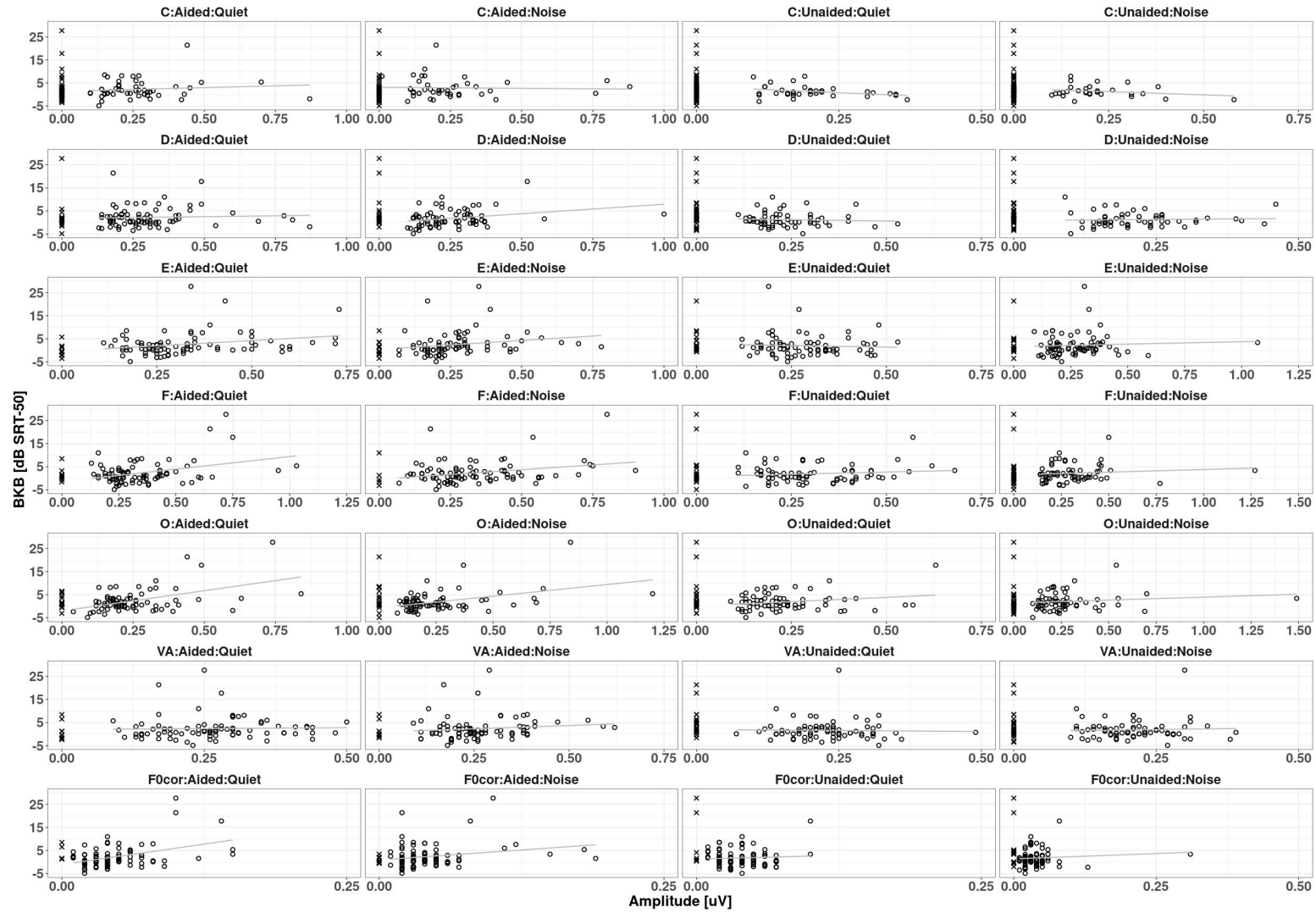
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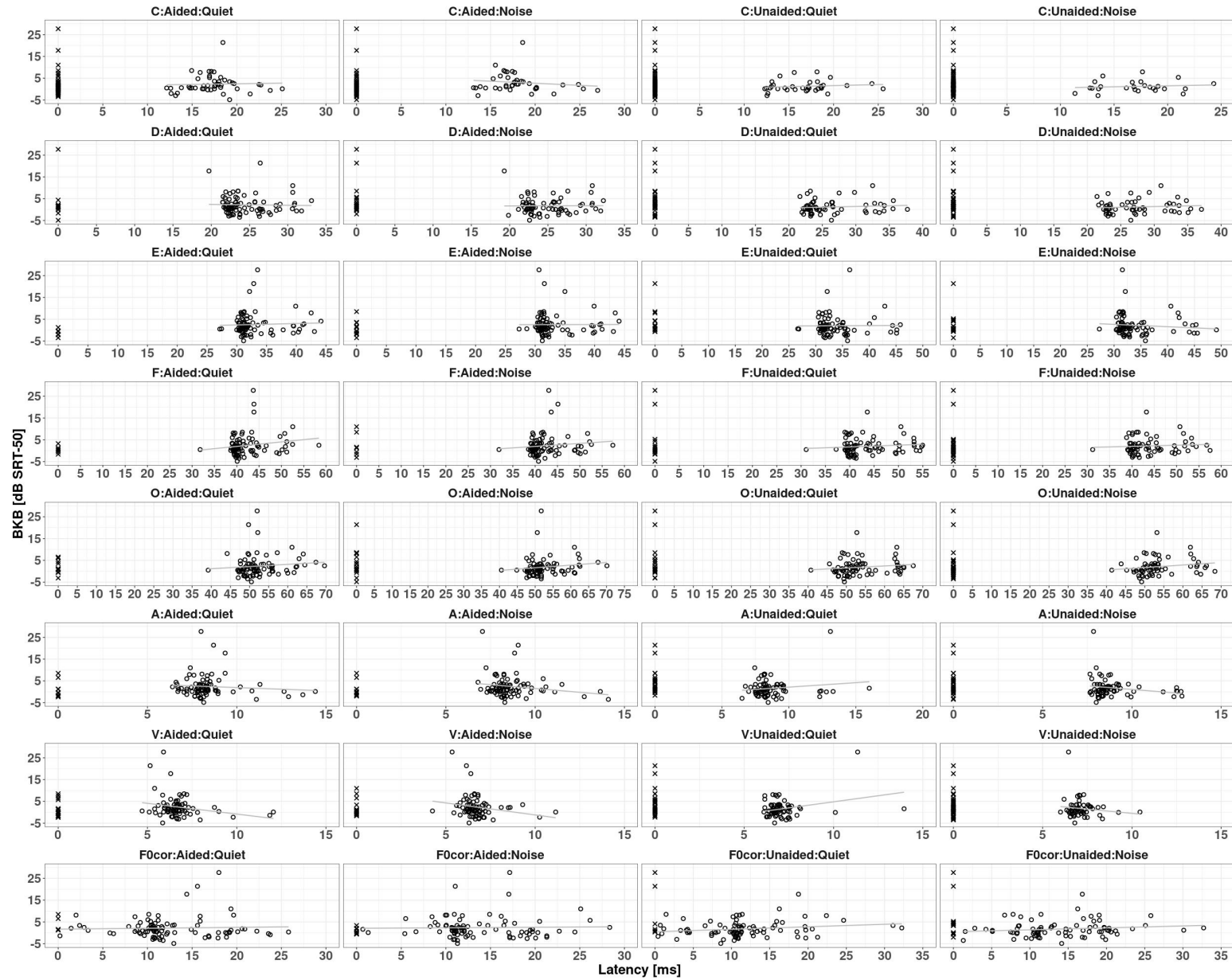
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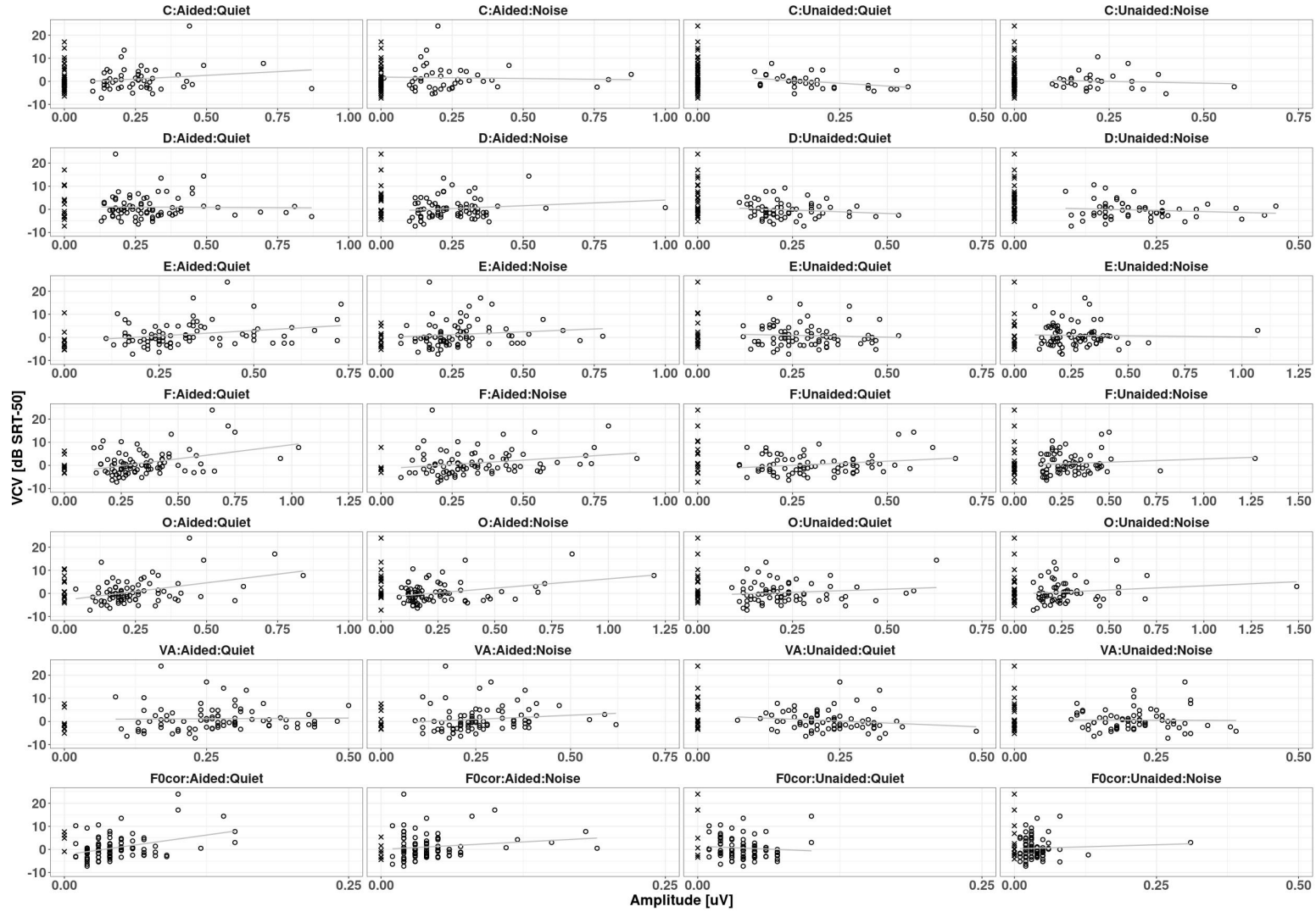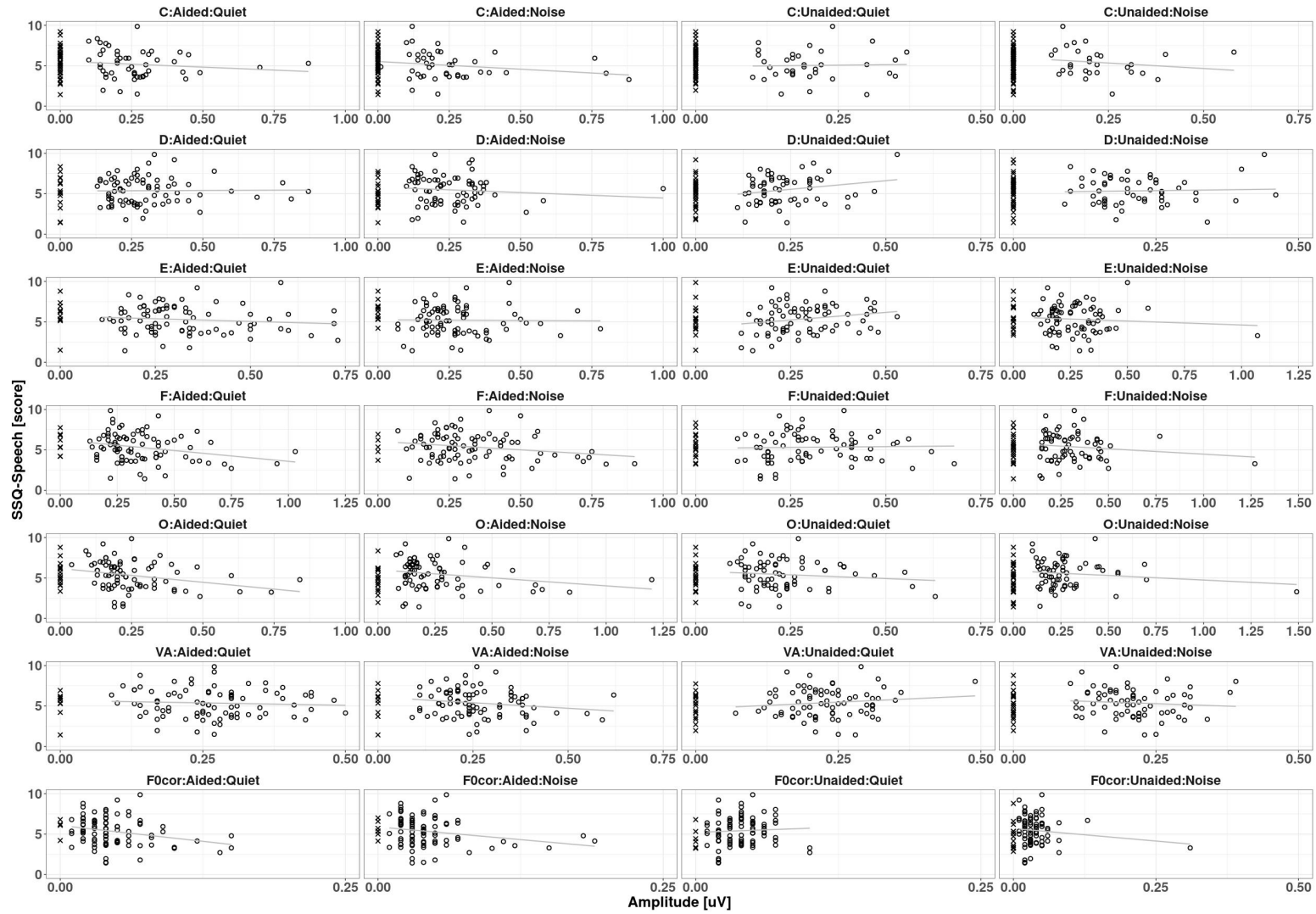
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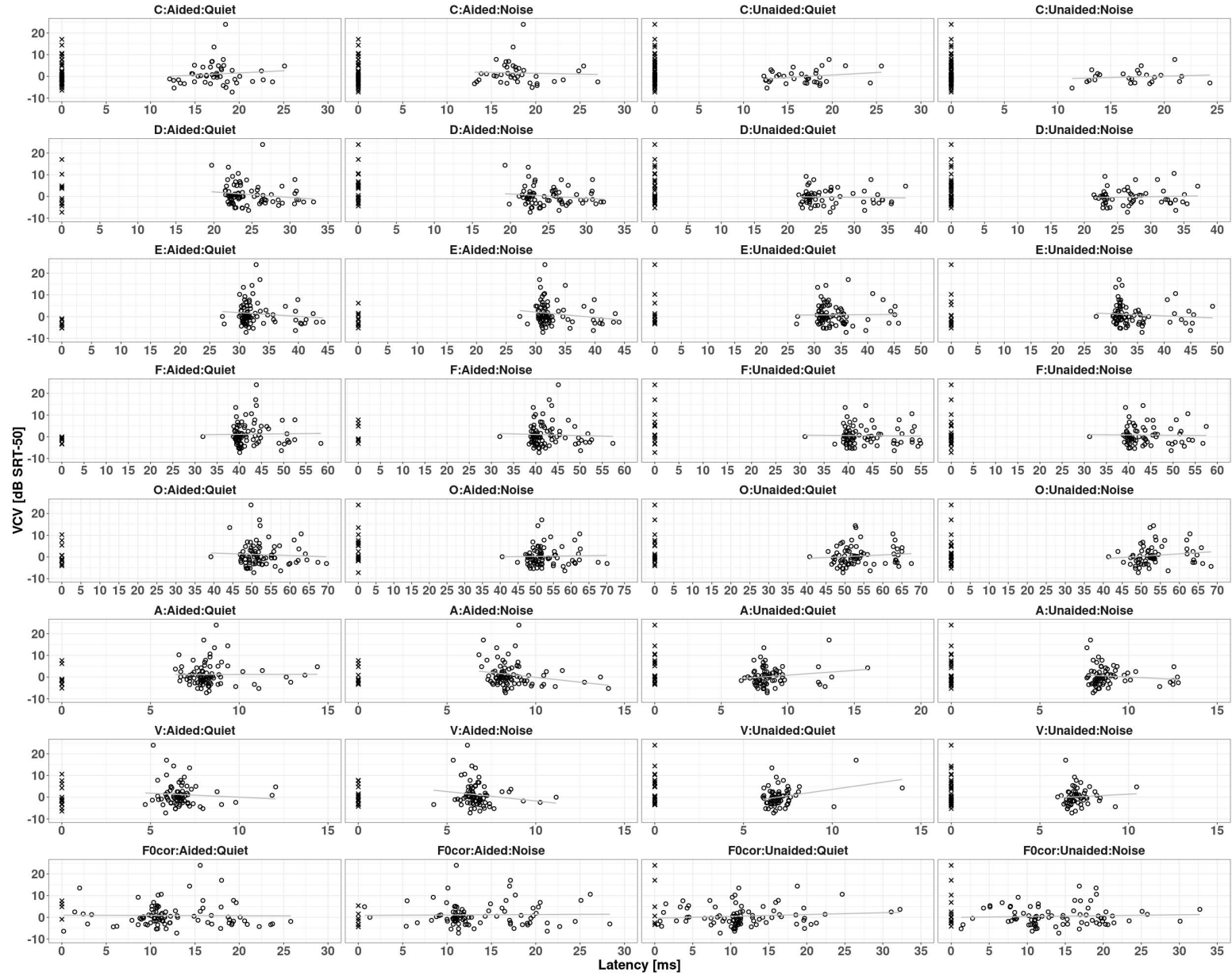
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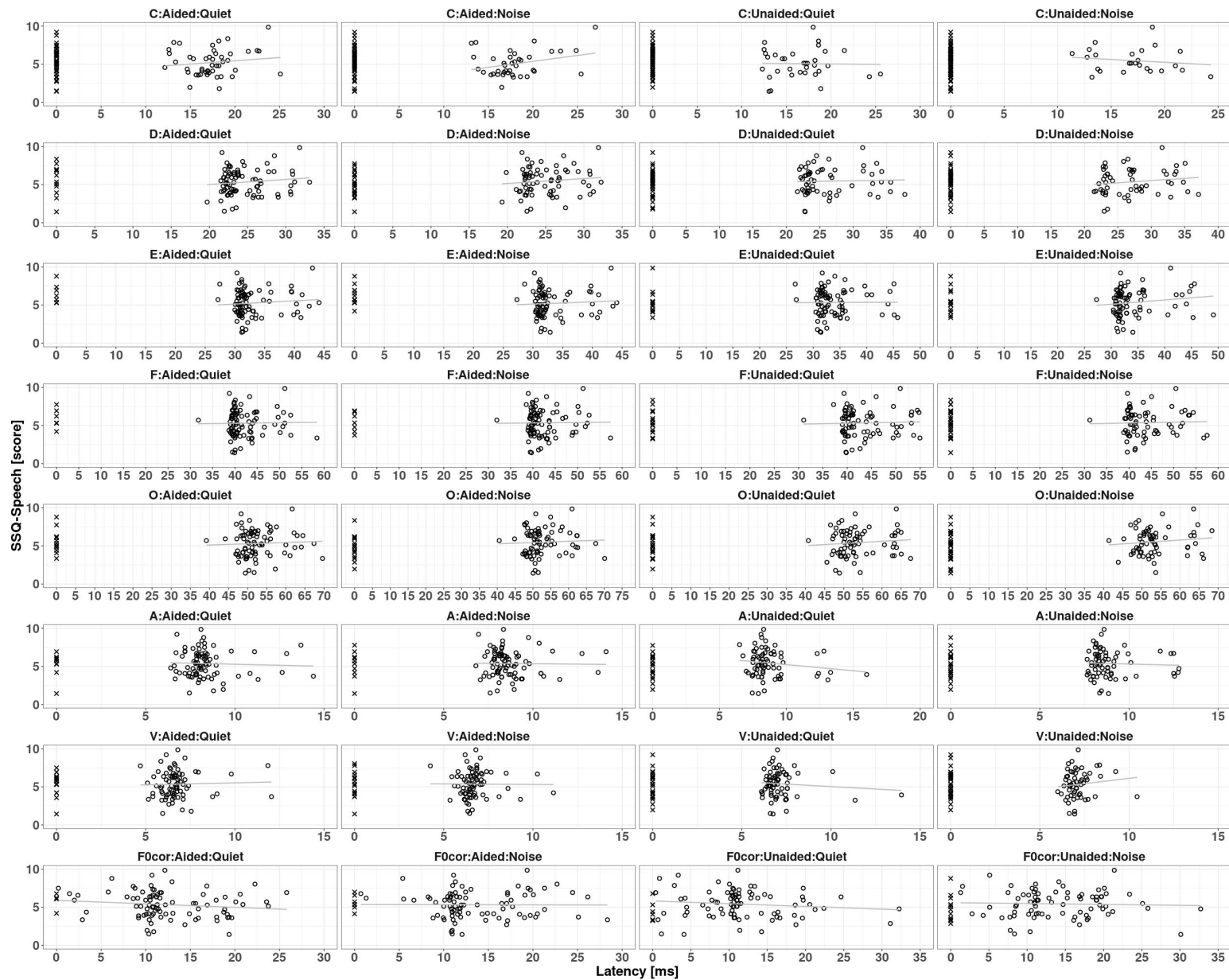
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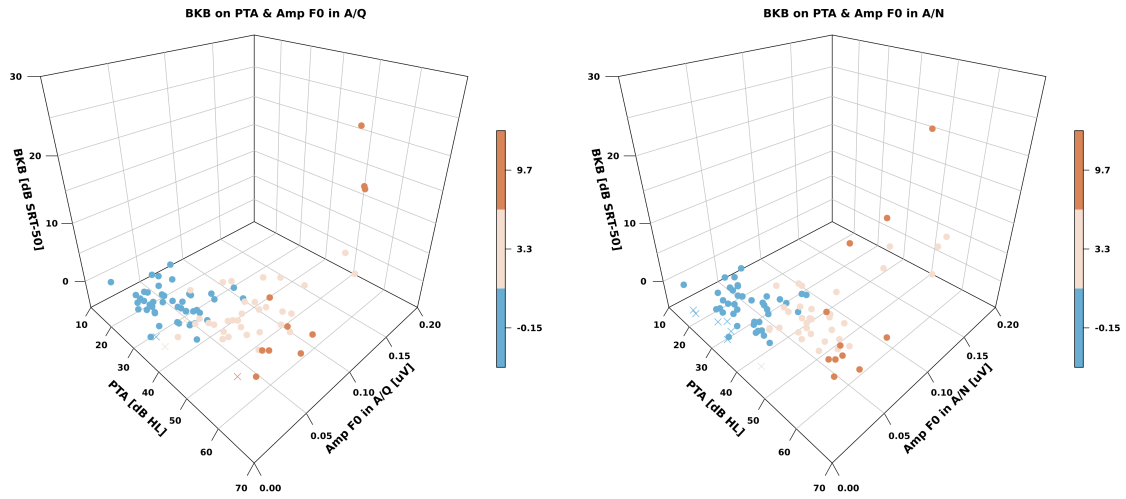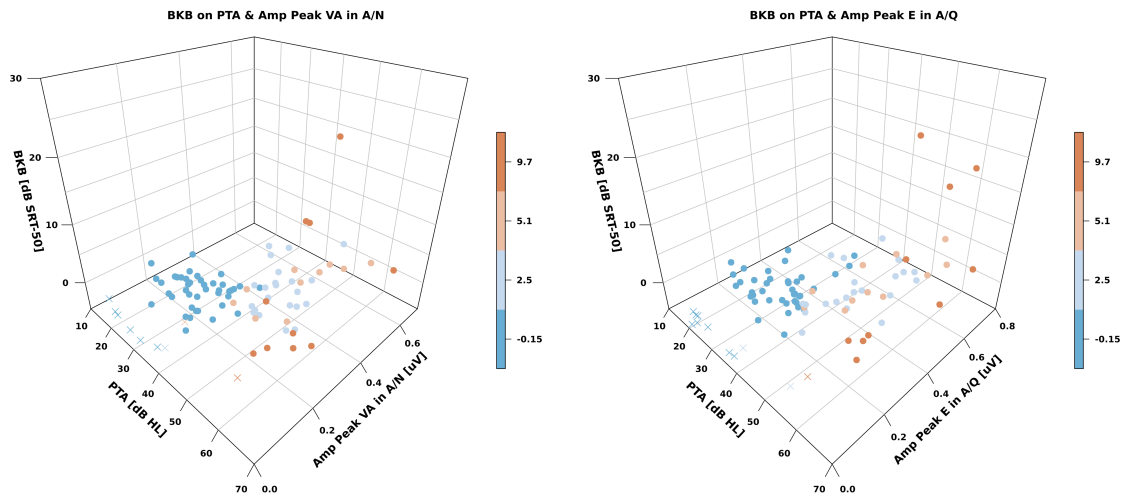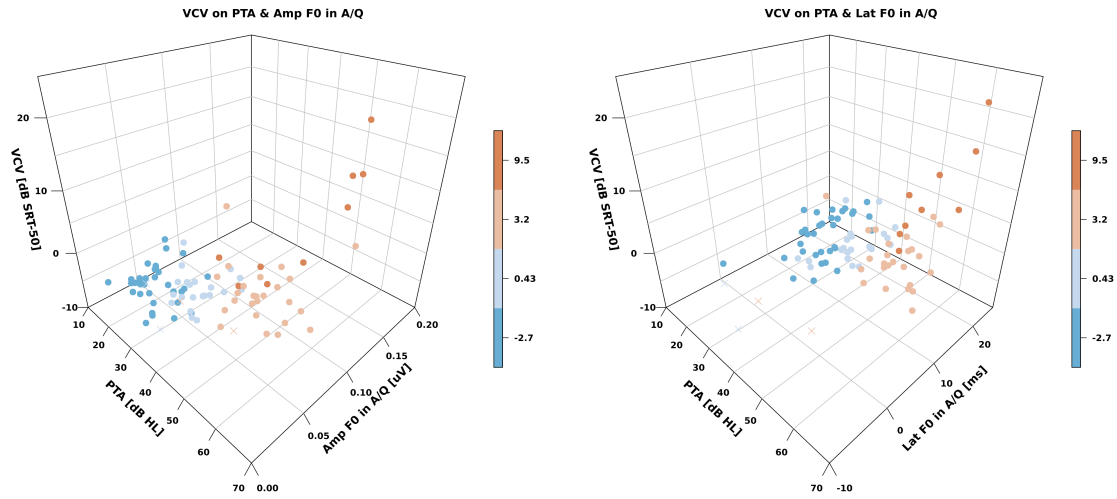
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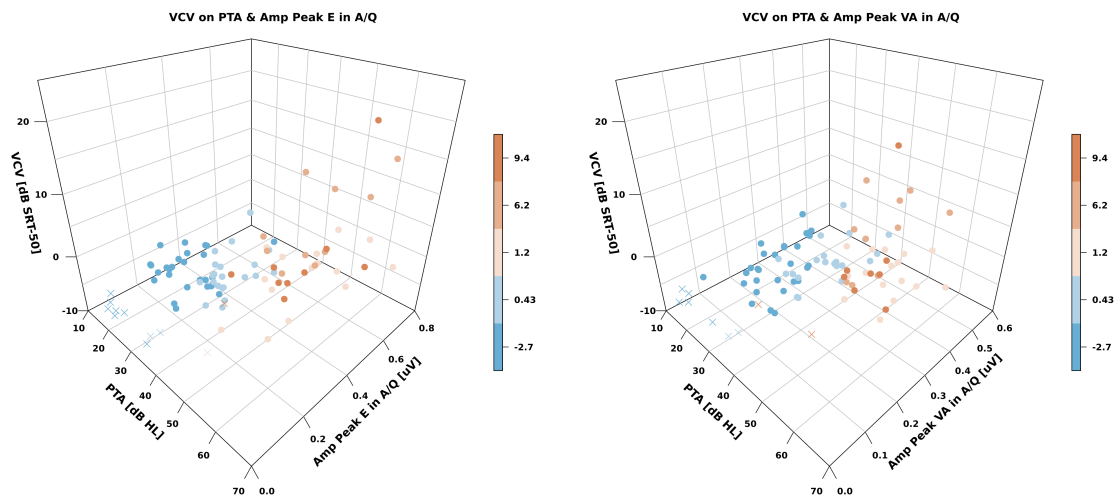
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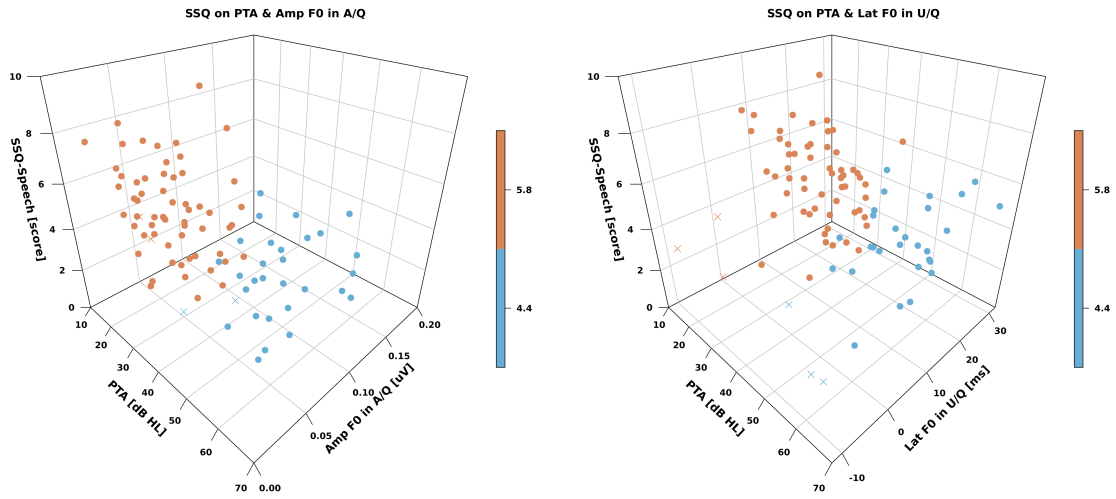
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Figure 14: Speech-ABR peaks tree. SSQ-Speech score on PTA & Amp Peak E in A/Q (left panel); SSQ-Speech score on PTA & Amp Peak F in A/N (right panel). Amp: amplitude; A/Q: aided speech-ABRs in quiet; A/N: aided speech-ABRs in noise. Missing peaks are indicated with crosses at 0 uV for graphical convenience. Note: the y-axis scale is not equal across panels.
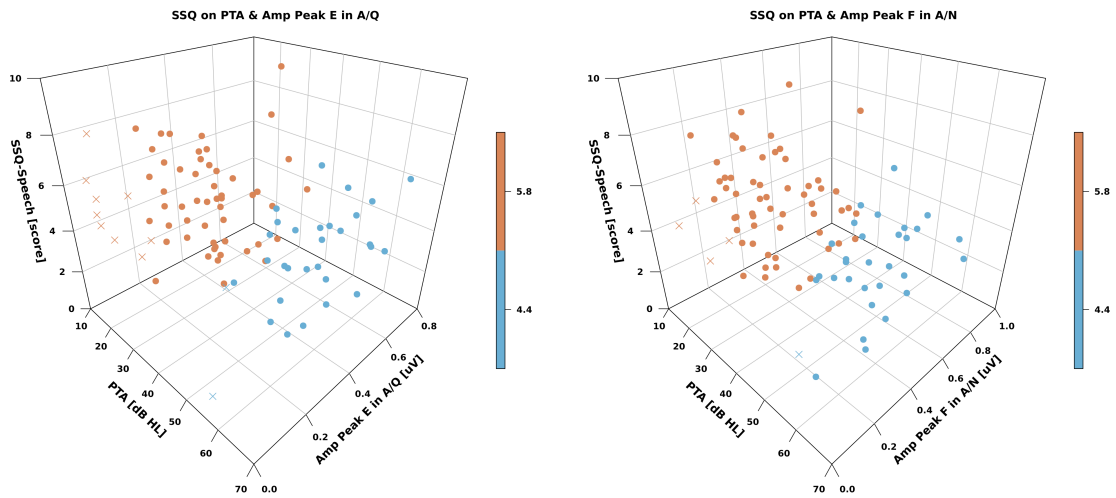
Table 1: Regression trees summary table. DV: dependent variable; CP: complexity parameter; PRESS: predicted residual error sum of squares statistic; F0: tree using F0 encoding measures; ABR: tree using speech-ABR peaks; Lat: latency; Amp: amplitude; A/Q: aided speech-ABRs in quiet.

DV	Tree	CP	Num Split	Var Split	Relative Error $(1-R^2)$	Cross-Validation Error (PRESS)
BKB SRT50	F0	0.319	0		1	1.023
BKB SRT50	F0	0.111	1	PTA	0.681	0.875
BKB SRT50	F0	0.016	2	PTA	0.570	0.774
BKB SRT50	ABR	0.319	0		1	1.023
BKB SRT50	ABR	0.111	1	PTA	0.681	0.875
BKB SRT50	ABR	0.024	2	PTA	0.570	0.800
BKB SRT50	ABR	0.020	3	Lat Peak F in A/Q	0.547	0.780
VCV SRT50	F0	0.333	0		1	1.016
VCV SRT50	F0	0.109	1	PTA	0.667	0.836
VCV SRT50	F0	0.053	2	PTA	0.558	0.768
VCV SRT50	F0	0.048	3	Lat F0 in A/Q	0.506	0.747
VCV SRT50	ABR	0.333	0		1	1.016
VCV SRT50	ABR	0.121	1	PTA	0.667	0.836
VCV SRT50	ABR	0.060	2	PTA	0.546	0.788
VCV SRT50	ABR	0.053	3	Amp Peak VA in A/Q	0.485	0.809
VCV SRT50	ABR	0.027	4	Age	0.433	0.771
SSQ Speech	F0	0.165	0		1	1.024
SSQ Speech	F0	0.069	1	PTA	0.835	0.928
SSQ Speech	ABR	0.165	0		1	1.024
SSQ Speech	ABR	0.071	1	PTA	0.835	0.928

Table 2: The three most important variables for each tree. Values are in % in proportion of all variables. Lat: latency; Amp: amplitude; A/Q: aided speech-ABRs in quiet; A/N: aided speech-ABRs in noise; U/Q: unaided speech-ABRs in quiet.

F0 tree		ABR tree	
BKB SRT50			
PTA	82	PTA	64
Amp F0 in A/Q	8	Amp Peak VA in A/N	6
Amp F0 in A/N	6	Amp Peak E in A/Q	5
VCV SRT50			
PTA	43	PTA	41
Amp F0 in A/Q	20	Amp Peak VA in A/Q	11
Lat F0 in A/Q	13	Amp Peak E in A/Q	9
SSQ Speech			
PTA	63	PTA	84
Amp F0 in A/Q	20	Amp Peak E in A/Q	5
Lat F0 in U/Q	8	Amp Peak F in A/N	5