

## Mixed Model Analysis

### Model Dimension<sup>a</sup>

		Number of Levels	Covariance Structure	Number of Parameters
Fixed Effects	Intercept	1		1
	SNR	3		2
	Program	6		5
	Noise_Type	2		1
	SNR * Program	18		10
	SNR * Noise_Type	6		2
	Program * Noise_Type	12		5
	SNR * Program * Noise_Type	36		10
Random Effects	Audiogram	4	Variance Components	1
Residual				1
Total		88		38

a. Dependent Variable: pMOS.

### Information Criteria<sup>a</sup>

-2 Restricted Log Likelihood	480.01544573
Akaike's Information Criterion (AIC)	484.01544573
Hurvich and Tsai's Criterion (AICC)	484.02622740
Bozdogan's Criterion (CAIC)	496.05045801
Schwarz's Bayesian Criterion (BIC)	494.05045801

The information criteria are displayed in smaller-is-better form.

a. Dependent Variable: pMOS.

### Coefficients of Determination

Pseudo-R Square Measures	Marginal	.583
	Conditional	.587

### Intraclass Correlation Coefficients

Overall ICCs	Adjusted	.010
	Conditional	.004

### Fixed Effects

#### Type III Tests of Fixed Effects<sup>a</sup>

Source	Numerator df	Denominator df	F	Sig.
Intercept	1	3.003	13169.327	<.001
SNR	2	1113.000	519.078	<.001
Program	5	1113.000	92.467	<.001
Noise_Type	1	1113.000	26.640	<.001
SNR * Program	10	1113.000	1.590	.104
SNR * Noise_Type	2	1113.000	21.992	<.001
Program * Noise_Type	5	1113.000	7.149	<.001
SNR * Program * Noise_Type	10	1113.000	.364	.962

a. Dependent Variable: pMOS.

### Covariance Parameters

#### Estimates of Covariance Parameters<sup>a</sup>

Parameter	Estimate	Std. Error
Residual	.080	.003
Audiogram Variance	.001	.001

a. Dependent Variable: pMOS.

### Estimated Marginal Means

#### 1. SNR

#### Estimates<sup>a</sup>

SNR	Mean	Std. Error	df	95% Confidence Interval	
				Lower Bound	Upper Bound
-5	1.586	.020	6.828	1.537	1.634
0	1.870	.020	6.828	1.821	1.918
5	2.242	.020	6.828	2.194	2.291

a. Dependent Variable: pMOS.

### Pairwise Comparisons<sup>a</sup>

(I) SNR	(J) SNR	Mean Difference (I-J)	Std. Error	df	Sig. <sup>c</sup>	95% Confidence Interval for Difference <sup>c</sup>	
						Lower Bound	Upper Bound
-5	0	-.284 <sup>*</sup>	.020	1113.000	<.001	-.333	-.235
	5	-.657 <sup>*</sup>	.020	1113.000	<.001	-.706	-.608
0	-5	.284 <sup>*</sup>	.020	1113.000	<.001	.235	.333
	5	-.373 <sup>*</sup>	.020	1113.000	<.001	-.422	-.324
5	-5	.657 <sup>*</sup>	.020	1113.000	<.001	.608	.706
	0	.373 <sup>*</sup>	.020	1113.000	<.001	.324	.422

Based on estimated marginal means

\*. The mean difference is significant at the .05 level.

a. Dependent Variable: pMOS.

c. Adjustment for multiple comparisons: Bonferroni.

### Univariate Tests<sup>a</sup>

Numerator df	Denominator df	F	Sig.
2	1113.000	519.078	<.001

The F tests the effect of SNR. This test is based on the linearly independent pairwise comparisons among the estimated marginal means.

a. Dependent Variable: pMOS.

## 2. Program

### Estimates<sup>a</sup>

Program	Mean	Std. Error	df	95% Confidence Interval	
				Lower Bound	Upper Bound
No Processing	1.686	.025	15.420	1.633	1.739
Beam	1.806	.025	15.420	1.753	1.859
Beam + NoiseBlock	1.862	.025	15.420	1.809	1.915
DNN	1.979	.025	15.420	1.926	2.032
NoiseBlock	1.811	.025	15.420	1.758	1.864
Beam + DNN	2.251	.025	15.420	2.198	2.304

a. Dependent Variable: pMOS.

### Pairwise Comparisons<sup>a</sup>

(I) Program	(J) Program	Mean Difference (I-J)	Std. Error	df	Sig. <sup>c</sup>
No Processing	Beam	-.119 <sup>*</sup>	.029	1113.000	<.001
	Beam + NoiseBlock	-.176 <sup>*</sup>	.029	1113.000	<.001
	DNN	-.293 <sup>*</sup>	.029	1113.000	<.001
	NoiseBlock	-.125 <sup>*</sup>	.029	1113.000	<.001
	Beam + DNN	-.564 <sup>*</sup>	.029	1113.000	<.001
Beam	No Processing	.119 <sup>*</sup>	.029	1113.000	<.001
	Beam + NoiseBlock	-.056	.029	1113.000	.769
	DNN	-.173 <sup>*</sup>	.029	1113.000	<.001
	NoiseBlock	-.005	.029	1113.000	1.000
	Beam + DNN	-.445 <sup>*</sup>	.029	1113.000	<.001
Beam + NoiseBlock	No Processing	.176 <sup>*</sup>	.029	1113.000	<.001
	Beam	.056	.029	1113.000	.769
	DNN	-.117 <sup>*</sup>	.029	1113.000	<.001
	NoiseBlock	.051	.029	1113.000	1.000
	Beam + DNN	-.389 <sup>*</sup>	.029	1113.000	<.001
DNN	No Processing	.293 <sup>*</sup>	.029	1113.000	<.001
	Beam	.173 <sup>*</sup>	.029	1113.000	<.001
	Beam + NoiseBlock	.117 <sup>*</sup>	.029	1113.000	<.001
	NoiseBlock	.168 <sup>*</sup>	.029	1113.000	<.001
	Beam + DNN	-.272 <sup>*</sup>	.029	1113.000	<.001
NoiseBlock	No Processing	.125 <sup>*</sup>	.029	1113.000	<.001
	Beam	.005	.029	1113.000	1.000
	Beam + NoiseBlock	-.051	.029	1113.000	1.000
	DNN	-.168 <sup>*</sup>	.029	1113.000	<.001
	Beam + DNN	-.440 <sup>*</sup>	.029	1113.000	<.001
Beam + DNN	No Processing	.564 <sup>*</sup>	.029	1113.000	<.001
	Beam	.445 <sup>*</sup>	.029	1113.000	<.001
	Beam + NoiseBlock	.389 <sup>*</sup>	.029	1113.000	<.001
	DNN	.272 <sup>*</sup>	.029	1113.000	<.001
	NoiseBlock	.440 <sup>*</sup>	.029	1113.000	<.001

### Pairwise Comparisons<sup>a</sup>

(I) Program	(J) Program	95% Confidence Interval for Difference <sup>c</sup>	
		Lower Bound	Upper Bound
No Processing	Beam	-.204	-.034
	Beam + NoiseBlock	-.261	-.091
	DNN	-.378	-.208
	NoiseBlock	-.210	-.040
	Beam + DNN	-.649	-.479
Beam	No Processing	.034	.204
	Beam + NoiseBlock	-.141	.029
	DNN	-.258	-.088
	NoiseBlock	-.090	.080
	Beam + DNN	-.530	-.360
Beam + NoiseBlock	No Processing	.091	.261
	Beam	-.029	.141
	DNN	-.202	-.032
	NoiseBlock	-.034	.136
	Beam + DNN	-.474	-.304
DNN	No Processing	.208	.378
	Beam	.088	.258
	Beam + NoiseBlock	.032	.202
	NoiseBlock	.083	.253
	Beam + DNN	-.357	-.187
NoiseBlock	No Processing	.040	.210
	Beam	-.080	.090
	Beam + NoiseBlock	-.136	.034
	DNN	-.253	-.083
	Beam + DNN	-.525	-.355
Beam + DNN	No Processing	.479	.649
	Beam	.360	.530
	Beam + NoiseBlock	.304	.474
	DNN	.187	.357
	NoiseBlock	.355	.525

Based on estimated marginal means

\*. The mean difference is significant at the .05 level.

a. Dependent Variable: pMOS.

c. Adjustment for multiple comparisons: Bonferroni.

### Univariate Tests<sup>a</sup>

Numerator df	Denominator df	F	Sig.
5	1113.000	92.467	<.001

The F tests the effect of Program. This test is based on the linearly independent pairwise comparisons among the estimated marginal means.

a. Dependent Variable: pMOS.

### 3. Noise\_Type

#### Estimates<sup>a</sup>

Noise_Type	Mean	Std. Error	df	95% Confidence Interval	
				Lower Bound	Upper Bound
SSN	1.942	.019	4.723	1.894	1.991
Babble	1.856	.019	4.723	1.808	1.905

a. Dependent Variable: pMOS.

#### Pairwise Comparisons<sup>a</sup>

(I) Noise_Type	(J) Noise_Type	Mean Difference (I-J)	Std. Error	df	Sig. <sup>c</sup>	95% Confidence Interval for <sup>c</sup> ... Lower Bound
SSN	Babble	.086 <sup>*</sup>	.017	1113.000	<.001	.053
Babble	SSN	-.086 <sup>*</sup>	.017	1113.000	<.001	-.119

#### Pairwise Comparisons<sup>a</sup>

(I) Noise_Type	(J) Noise_Type	95% Confidence Interval for <sup>c</sup> ... Upper Bound
SSN	Babble	.119
Babble	SSN	-.053

Based on estimated marginal means

\*. The mean difference is significant at the .05 level.

a. Dependent Variable: pMOS.

c. Adjustment for multiple comparisons: Bonferroni.

### Univariate Tests<sup>a</sup>

Numerator df	Denominator df	F	Sig.
1	1113.000	26.640	<.001

The F tests the effect of Noise\_Type. This test is based on the linearly independent pairwise comparisons among the estimated marginal means.

a. Dependent Variable: pMOS.

### 4. SNR \* Program

#### Estimates<sup>a</sup>

SNR	Program	Mean	Std. Error	df	95% Confidence Interval	
					Lower Bound	Upper Bound
-5	No Processing	1.442	.038	80.948	1.366	1.518
	Beam	1.499	.038	80.948	1.423	1.575
	Beam + NoiseBlock	1.548	.038	80.948	1.472	1.624
	DNN	1.663	.038	80.948	1.587	1.738
	NoiseBlock	1.507	.038	80.948	1.431	1.583
	Beam + DNN	1.856	.038	80.948	1.780	1.931
0	No Processing	1.652	.038	80.948	1.576	1.728
	Beam	1.773	.038	80.948	1.697	1.849
	Beam + NoiseBlock	1.834	.038	80.948	1.758	1.910
	DNN	1.936	.038	80.948	1.860	2.012
	NoiseBlock	1.775	.038	80.948	1.699	1.851
	Beam + DNN	2.249	.038	80.948	2.173	2.325
5	No Processing	1.965	.038	80.948	1.889	2.041
	Beam	2.146	.038	80.948	2.070	2.222
	Beam + NoiseBlock	2.205	.038	80.948	2.129	2.281
	DNN	2.338	.038	80.948	2.262	2.414
	NoiseBlock	2.152	.038	80.948	2.076	2.228
	Beam + DNN	2.648	.038	80.948	2.572	2.724

a. Dependent Variable: pMOS.

### Pairwise Comparisons<sup>a</sup>

SNR	(I) Program	(J) Program	Mean Difference (I-J)	Std. Error	df	Sig. <sup>c</sup>
-5	No Processing	Beam	-.058	.050	1113.000	1.000
		Beam + NoiseBlock	-.107	.050	1113.000	.501
		DNN	-.221 <sup>*</sup>	.050	1113.000	<.001
		NoiseBlock	-.065	.050	1113.000	1.000
		Beam + DNN	-.414 <sup>*</sup>	.050	1113.000	<.001
	Beam	No Processing	.058	.050	1113.000	1.000
		Beam + NoiseBlock	-.049	.050	1113.000	1.000
		DNN	-.163 <sup>*</sup>	.050	1113.000	.017
		NoiseBlock	-.008	.050	1113.000	1.000
		Beam + DNN	-.356 <sup>*</sup>	.050	1113.000	<.001
	Beam + NoiseBlock	No Processing	.107	.050	1113.000	.501
		Beam	.049	.050	1113.000	1.000
		DNN	-.114	.050	1113.000	.343
		NoiseBlock	.041	.050	1113.000	1.000
		Beam + DNN	-.307 <sup>*</sup>	.050	1113.000	<.001
	DNN	No Processing	.221 <sup>*</sup>	.050	1113.000	<.001
		Beam	.163 <sup>*</sup>	.050	1113.000	.017
		Beam + NoiseBlock	.114	.050	1113.000	.343
		NoiseBlock	.155 <sup>*</sup>	.050	1113.000	.029
		Beam + DNN	-.193 <sup>*</sup>	.050	1113.000	.002
	NoiseBlock	No Processing	.065	.050	1113.000	1.000
		Beam	.008	.050	1113.000	1.000
		Beam + NoiseBlock	-.041	.050	1113.000	1.000
		DNN	-.155 <sup>*</sup>	.050	1113.000	.029
		Beam + DNN	-.348 <sup>*</sup>	.050	1113.000	<.001
	Beam + DNN	No Processing	.414 <sup>*</sup>	.050	1113.000	<.001
		Beam	.356 <sup>*</sup>	.050	1113.000	<.001
		Beam + NoiseBlock	.307 <sup>*</sup>	.050	1113.000	<.001
		DNN	.193 <sup>*</sup>	.050	1113.000	.002
		NoiseBlock	.348 <sup>*</sup>	.050	1113.000	<.001
0	No Processing	Beam	-.121	.050	1113.000	.243
		Beam + NoiseBlock	-.182 <sup>*</sup>	.050	1113.000	.004
		DNN	-.284 <sup>*</sup>	.050	1113.000	<.001
		NoiseBlock	-.123	.050	1113.000	.218
		Beam + DNN	-.597 <sup>*</sup>	.050	1113.000	<.001



### Pairwise Comparisons<sup>a</sup>

SNR	(I) Program	(J) Program	95% Confidence Interval for Difference <sup>c</sup>	
			Lower Bound	Upper Bound
-5	No Processing	Beam	-.205	.090
		Beam + NoiseBlock	-.254	.041
		DNN	-.368	-.073
		NoiseBlock	-.213	.082
		Beam + DNN	-.561	-.266
	Beam	No Processing	-.090	.205
		Beam + NoiseBlock	-.196	.098
		DNN	-.310	-.016
		NoiseBlock	-.155	.139
		Beam + DNN	-.503	-.209
	Beam + NoiseBlock	No Processing	-.041	.254
		Beam	-.098	.196
		DNN	-.261	.033
		NoiseBlock	-.106	.189
		Beam + DNN	-.454	-.160
	DNN	No Processing	.073	.368
		Beam	.016	.310
		Beam + NoiseBlock	-.033	.261
		NoiseBlock	.008	.303
		Beam + DNN	-.340	-.046
	NoiseBlock	No Processing	-.082	.213
		Beam	-.139	.155
		Beam + NoiseBlock	-.189	.106
		DNN	-.303	-.008
		Beam + DNN	-.496	-.201
	Beam + DNN	No Processing	.266	.561
		Beam	.209	.503
		Beam + NoiseBlock	.160	.454
		DNN	.046	.340
		NoiseBlock	.201	.496
0	No Processing	Beam	-.268	.027
		Beam + NoiseBlock	-.329	-.034
		DNN	-.431	-.137
		NoiseBlock	-.270	.025
		Beam + DNN	-.744	-.450

### Pairwise Comparisons<sup>a</sup>

SNR	(I) Program	(J) Program	Mean Difference (I-J)	Std. Error	df	Sig. <sup>c</sup>
	Beam	No Processing	.121	.050	1113.000	.243
		Beam + NoiseBlock	-.061	.050	1113.000	1.000
		DNN	-.164 <sup>*</sup>	.050	1113.000	.017
		NoiseBlock	-.002	.050	1113.000	1.000
		Beam + DNN	-.476 <sup>*</sup>	.050	1113.000	<.001
	Beam + NoiseBlock	No Processing	.182 <sup>*</sup>	.050	1113.000	.004
		Beam	.061	.050	1113.000	1.000
		DNN	-.103	.050	1113.000	.611
		NoiseBlock	.059	.050	1113.000	1.000
		Beam + DNN	-.415 <sup>*</sup>	.050	1113.000	<.001
	DNN	No Processing	.284 <sup>*</sup>	.050	1113.000	<.001
		Beam	.164 <sup>*</sup>	.050	1113.000	.017
		Beam + NoiseBlock	.103	.050	1113.000	.611
		NoiseBlock	.162 <sup>*</sup>	.050	1113.000	.019
		Beam + DNN	-.313 <sup>*</sup>	.050	1113.000	<.001
	NoiseBlock	No Processing	.123	.050	1113.000	.218
		Beam	.002	.050	1113.000	1.000
		Beam + NoiseBlock	-.059	.050	1113.000	1.000
		DNN	-.162 <sup>*</sup>	.050	1113.000	.019
		Beam + DNN	-.474 <sup>*</sup>	.050	1113.000	<.001
	Beam + DNN	No Processing	.597 <sup>*</sup>	.050	1113.000	<.001
		Beam	.476 <sup>*</sup>	.050	1113.000	<.001
		Beam + NoiseBlock	.415 <sup>*</sup>	.050	1113.000	<.001
		DNN	.313 <sup>*</sup>	.050	1113.000	<.001
		NoiseBlock	.474 <sup>*</sup>	.050	1113.000	<.001
5	No Processing	Beam	-.180 <sup>*</sup>	.050	1113.000	.005
		Beam + NoiseBlock	-.239 <sup>*</sup>	.050	1113.000	<.001
		DNN	-.373 <sup>*</sup>	.050	1113.000	<.001
		NoiseBlock	-.187 <sup>*</sup>	.050	1113.000	.003
		Beam + DNN	-.683 <sup>*</sup>	.050	1113.000	<.001
	Beam	No Processing	.180 <sup>*</sup>	.050	1113.000	.005
		Beam + NoiseBlock	-.059	.050	1113.000	1.000
		DNN	-.193 <sup>*</sup>	.050	1113.000	.002
		NoiseBlock	-.006	.050	1113.000	1.000
		Beam + DNN	-.502 <sup>*</sup>	.050	1113.000	<.001

### Pairwise Comparisons<sup>a</sup>

SNR	(I) Program	(J) Program	95% Confidence Interval for Difference <sup>c</sup>	
			Lower Bound	Upper Bound
	Beam	No Processing	-.027	.268
		Beam + NoiseBlock	-.208	.086
		DNN	-.311	-.016
		NoiseBlock	-.149	.145
		Beam + DNN	-.624	-.329
	Beam + NoiseBlock	No Processing	.034	.329
		Beam	-.086	.208
		DNN	-.250	.045
		NoiseBlock	-.088	.206
		Beam + DNN	-.562	-.268
	DNN	No Processing	.137	.431
		Beam	.016	.311
		Beam + NoiseBlock	-.045	.250
		NoiseBlock	.014	.309
		Beam + DNN	-.460	-.165
	NoiseBlock	No Processing	-.025	.270
		Beam	-.145	.149
		Beam + NoiseBlock	-.206	.088
		DNN	-.309	-.014
		Beam + DNN	-.622	-.327
	Beam + DNN	No Processing	.450	.744
		Beam	.329	.624
		Beam + NoiseBlock	.268	.562
		DNN	.165	.460
		NoiseBlock	.327	.622
5	No Processing	Beam	-.328	-.033
		Beam + NoiseBlock	-.387	-.092
		DNN	-.520	-.226
		NoiseBlock	-.334	-.039
		Beam + DNN	-.830	-.535
	Beam	No Processing	.033	.328
		Beam + NoiseBlock	-.206	.088
		DNN	-.340	-.045
		NoiseBlock	-.154	.141
		Beam + DNN	-.650	-.355

### Pairwise Comparisons<sup>a</sup>

SNR	(I) Program	(J) Program	Mean Difference (I-J)	Std. Error	df	Sig. <sup>c</sup>
	Beam + NoiseBlock	No Processing	.239 <sup>*</sup>	.050	1113.000	<.001
		Beam	.059	.050	1113.000	1.000
		DNN	-.134	.050	1113.000	.116
		NoiseBlock	.053	.050	1113.000	1.000
		Beam + DNN	-.443 <sup>*</sup>	.050	1113.000	<.001
	DNN	No Processing	.373 <sup>*</sup>	.050	1113.000	<.001
		Beam	.193 <sup>*</sup>	.050	1113.000	.002
		Beam + NoiseBlock	.134	.050	1113.000	.116
		NoiseBlock	.186 <sup>*</sup>	.050	1113.000	.003
		Beam + DNN	-.310 <sup>*</sup>	.050	1113.000	<.001
	NoiseBlock	No Processing	.187 <sup>*</sup>	.050	1113.000	.003
		Beam	.006	.050	1113.000	1.000
		Beam + NoiseBlock	-.053	.050	1113.000	1.000
		DNN	-.186 <sup>*</sup>	.050	1113.000	.003
		Beam + DNN	-.496 <sup>*</sup>	.050	1113.000	<.001
	Beam + DNN	No Processing	.683 <sup>*</sup>	.050	1113.000	<.001
		Beam	.502 <sup>*</sup>	.050	1113.000	<.001
		Beam + NoiseBlock	.443 <sup>*</sup>	.050	1113.000	<.001
		DNN	.310 <sup>*</sup>	.050	1113.000	<.001
		NoiseBlock	.496 <sup>*</sup>	.050	1113.000	<.001

### Pairwise Comparisons<sup>a</sup>

SNR	(I) Program	(J) Program	95% Confidence Interval for Difference <sup>c</sup>	
			Lower Bound	Upper Bound
	Beam + NoiseBlock	No Processing	.092	.387
		Beam	-.088	.206
		DNN	-.281	.014
		NoiseBlock	-.095	.200
		Beam + DNN	-.591	-.296
	DNN	No Processing	.226	.520
		Beam	.045	.340
		Beam + NoiseBlock	-.014	.281
		NoiseBlock	.039	.334
		Beam + DNN	-.457	-.163
	NoiseBlock	No Processing	.039	.334
		Beam	-.141	.154
		Beam + NoiseBlock	-.200	.095
		DNN	-.334	-.039
		Beam + DNN	-.643	-.349
	Beam + DNN	No Processing	.535	.830
		Beam	.355	.650
		Beam + NoiseBlock	.296	.591
		DNN	.163	.457
		NoiseBlock	.349	.643

Based on estimated marginal means

\*. The mean difference is significant at the .05 level.

a. Dependent Variable: pMOS.

c. Adjustment for multiple comparisons: Bonferroni.

### Univariate Tests<sup>a</sup>

SNR	Numerator df	Denominator df	F	Sig.
-5	5	1113.000	18.263	<.001
0	5	1113.000	34.378	<.001
5	5	1113.000	43.006	<.001

Each F tests the simple effects of Program within each level combination of the other effects shown. These tests are based on the linearly independent pairwise comparisons among the estimated marginal means.

a. Dependent Variable: pMOS.

### 5. SNR \* Noise\_Type<sup>a</sup>

SNR	Noise_Type	Mean	Std. Error	df	95% Confidence Interval	
					Lower Bound	Upper Bound
-5	SSN	1.561	.025	15.420	1.508	1.614
	Babble	1.611	.025	15.420	1.558	1.664
0	SSN	1.913	.025	15.420	1.860	1.967
	Babble	1.826	.025	15.420	1.773	1.879
5	SSN	2.353	.025	15.420	2.300	2.406
	Babble	2.132	.025	15.420	2.079	2.185

a. Dependent Variable: pMOS.

### 6. Program \* Noise\_Type

#### Estimates<sup>a</sup>

Program	Noise_Type	Mean	Std. Error	df	95% Confidence Interval	
					Lower Bound	Upper Bound
No Processing	SSN	1.702	.032	42.378	1.637	1.767
	Babble	1.671	.032	42.378	1.606	1.736
Beam	SSN	1.788	.032	42.378	1.723	1.853
	Babble	1.824	.032	42.378	1.758	1.889
Beam + NoiseBlock	SSN	1.859	.032	42.378	1.794	1.924
	Babble	1.865	.032	42.378	1.800	1.931
DNN	SSN	2.083	.032	42.378	2.018	2.148
	Babble	1.875	.032	42.378	1.810	1.940
NoiseBlock	SSN	1.860	.032	42.378	1.795	1.925
	Babble	1.762	.032	42.378	1.697	1.827
Beam + DNN	SSN	2.362	.032	42.378	2.297	2.427
	Babble	2.140	.032	42.378	2.075	2.205

a. Dependent Variable: pMOS.

### Pairwise Comparisons<sup>a</sup>

Noise_Type	(I) Program	(J) Program	Mean Difference (I-J)	Std. Error	df
SSN	No Processing	Beam	-.086	.041	1113.000
		Beam + NoiseBlock	-.157*	.041	1113.000
		DNN	-.381*	.041	1113.000
		NoiseBlock	-.158*	.041	1113.000
		Beam + DNN	-.660*	.041	1113
	Beam	No Processing	.086	.041	1113.000
		Beam + NoiseBlock	-.071	.041	1113.000
		DNN	-.295*	.041	1113.000
		NoiseBlock	-.072	.041	1113.000
		Beam + DNN	-.574*	.041	1113
	Beam + NoiseBlock	No Processing	.157*	.041	1113.000
		Beam	.071	.041	1113.000
		DNN	-.224*	.041	1113.000
		NoiseBlock	-.001	.041	1113.000
		Beam + DNN	-.503*	.041	1113
	DNN	No Processing	.381*	.041	1113.000
		Beam	.295*	.041	1113.000
		Beam + NoiseBlock	.224*	.041	1113.000
		NoiseBlock	.223*	.041	1113.000
		Beam + DNN	-.279*	.041	1113
	NoiseBlock	No Processing	.158*	.041	1113.000
		Beam	.072	.041	1113.000
		Beam + NoiseBlock	.001	.041	1113.000
		DNN	-.223*	.041	1113.000
		Beam + DNN	-.502*	.041	1113
	Beam + DNN	No Processing	.660*	.041	1113
		Beam	.574*	.041	1113
		Beam + NoiseBlock	.503*	.041	1113
		DNN	.279*	.041	1113
		NoiseBlock	.502*	.041	1113
Babble	No Processing	Beam	-.153*	.041	1113.000
		Beam + NoiseBlock	-.194*	.041	1113.000
		DNN	-.204*	.041	1113.000
		NoiseBlock	-.091	.041	1113.000
		Beam + DNN	-.469*	.041	1113.000

### Pairwise Comparisons<sup>a</sup>

Noise_Type	(I) Program	(J) Program	Sig. <sup>c</sup>	95% Confidence Interval for Difference <sup>c</sup>	
				Lower Bound	Upper Bound
SSN	No Processing	Beam	.521	-.207	.034
		Beam + NoiseBlock	.002	-.278	-.037
		DNN	<.001	-.501	-.261
		NoiseBlock	.002	-.279	-.038
		Beam + DNN	<.001	-.780	-.540
	Beam	No Processing	.521	-.034	.207
		Beam + NoiseBlock	1.000	-.191	.049
		DNN	<.001	-.415	-.174
		NoiseBlock	1.000	-.192	.048
		Beam + DNN	<.001	-.694	-.453
	Beam + NoiseBlock	No Processing	.002	.037	.278
		Beam	1.000	-.049	.191
		DNN	<.001	-.344	-.104
		NoiseBlock	1.000	-.121	.119
		Beam + DNN	<.001	-.623	-.383
	DNN	No Processing	<.001	.261	.501
		Beam	<.001	.174	.415
		Beam + NoiseBlock	<.001	.104	.344
		NoiseBlock	<.001	.102	.343
		Beam + DNN	<.001	-.399	-.159
	NoiseBlock	No Processing	.002	.038	.279
		Beam	1.000	-.048	.192
		Beam + NoiseBlock	1.000	-.119	.121
		DNN	<.001	-.343	-.102
		Beam + DNN	<.001	-.622	-.381
	Beam + DNN	No Processing	<.001	.540	.780
		Beam	<.001	.453	.694
		Beam + NoiseBlock	<.001	.383	.623
		DNN	<.001	.159	.399
		NoiseBlock	<.001	.381	.622
Babble	No Processing	Beam	.003	-.273	-.032
		Beam + NoiseBlock	<.001	-.315	-.074
		DNN	<.001	-.324	-.084
		NoiseBlock	.389	-.211	.029
		Beam + DNN	<.001	-.589	-.349



### Pairwise Comparisons<sup>a</sup>

Noise_Type	(I) Program	(J) Program	Mean Difference (I-J)	Std. Error	df
	Beam	No Processing	.153 <sup>*</sup>	.041	1113.000
		Beam + NoiseBlock	-.042	.041	1113.000
		DNN	-.052	.041	1113.000
		NoiseBlock	.061	.041	1113.000
		Beam + DNN	-.316 <sup>*</sup>	.041	1113.000
	Beam + NoiseBlock	No Processing	.194 <sup>*</sup>	.041	1113.000
		Beam	.042	.041	1113.000
		DNN	-.010	.041	1113.000
		NoiseBlock	.103	.041	1113.000
		Beam + DNN	-.274 <sup>*</sup>	.041	1113.000
	DNN	No Processing	.204 <sup>*</sup>	.041	1113.000
		Beam	.052	.041	1113.000
		Beam + NoiseBlock	.010	.041	1113.000
		NoiseBlock	.113	.041	1113.000
		Beam + DNN	-.265 <sup>*</sup>	.041	1113.000
	NoiseBlock	No Processing	.091	.041	1113.000
		Beam	-.061	.041	1113.000
		Beam + NoiseBlock	-.103	.041	1113.000
		DNN	-.113	.041	1113.000
		Beam + DNN	-.378 <sup>*</sup>	.041	1113.000
	Beam + DNN	No Processing	.469 <sup>*</sup>	.041	1113.000
		Beam	.316 <sup>*</sup>	.041	1113.000
		Beam + NoiseBlock	.274 <sup>*</sup>	.041	1113.000
		DNN	.265 <sup>*</sup>	.041	1113.000
		NoiseBlock	.378 <sup>*</sup>	.041	1113.000

### Pairwise Comparisons<sup>a</sup>

Noise_Type	(I) Program	(J) Program	Sig. <sup>c</sup>	95% Confidence Interval for Difference <sup>c</sup>	
				Lower Bound	Upper Bound
	Beam	No Processing	.003	.032	.273
		Beam + NoiseBlock	1.000	-.162	.078
		DNN	1.000	-.172	.069
		NoiseBlock	1.000	-.059	.182
		Beam + DNN	<.001	-.437	-.196
	Beam + NoiseBlock	No Processing	<.001	.074	.315
		Beam	1.000	-.078	.162
		DNN	1.000	-.130	.111
		NoiseBlock	.175	-.017	.224
		Beam + DNN	<.001	-.395	-.154
	DNN	No Processing	<.001	.084	.324
		Beam	1.000	-.069	.172
		Beam + NoiseBlock	1.000	-.111	.130
		NoiseBlock	.087	-.007	.233
		Beam + DNN	<.001	-.385	-.144
	NoiseBlock	No Processing	.389	-.029	.211
		Beam	1.000	-.182	.059
		Beam + NoiseBlock	.175	-.224	.017
		DNN	.087	-.233	.007
		Beam + DNN	<.001	-.498	-.257
	Beam + DNN	No Processing	<.001	.349	.589
		Beam	<.001	.196	.437
		Beam + NoiseBlock	<.001	.154	.395
		DNN	<.001	.144	.385
		NoiseBlock	<.001	.257	.498

Based on estimated marginal means

\*. The mean difference is significant at the .05 level.

a. Dependent Variable: pMOS.

c. Adjustment for multiple comparisons: Bonferroni.

### Univariate Tests<sup>a</sup>

Noise_Type	Numerator df	Denominator df	F	Sig.
SSN	5	1113.000	69.662	<.001
Babble	5	1113.000	29.954	<.001

Each F tests the simple effects of Program within each level combination of the other effects shown. These tests are based on the linearly independent pairwise comparisons among the estimated marginal means.

a. Dependent Variable: pMOS.

### 7. SNR \* Program \* Noise\_Type

#### Estimates<sup>a</sup>

SNR	Program	Noise_Type	Mean	Std. Error	df	95% ... Lower Bound
-5	No Processing	SSN	1.379	.052	242.350	1.277
		Babble	1.504	.052	242.350	1.402
	Beam	SSN	1.439	.052	242.350	1.337
		Babble	1.560	.052	242.350	1.457
	Beam + NoiseBlock	SSN	1.468	.052	242.350	1.365
		Babble	1.629	.052	242.350	1.527
	DNN	SSN	1.681	.052	242.350	1.578
		Babble	1.644	.052	242.350	1.542
	NoiseBlock	SSN	1.472	.052	242.350	1.369
		Babble	1.542	.052	242.350	1.440
	Beam + DNN	SSN	1.926	.052	242.350	1.823
		Babble	1.785	.052	242.350	1.683
0	No Processing	SSN	1.665	.052	242.350	1.563
		Babble	1.639	.052	242.350	1.537
	Beam	SSN	1.763	.052	242.350	1.661
		Babble	1.782	.052	242.350	1.680
	Beam + NoiseBlock	SSN	1.843	.052	242.350	1.741
		Babble	1.824	.052	242.350	1.722
	DNN	SSN	2.042	.052	242.350	1.939
		Babble	1.831	.052	242.350	1.728
	NoiseBlock	SSN	1.826	.052	242.350	1.723
		Babble	1.724	.052	242.350	1.621
	Beam + DNN	SSN	2.342	.052	242.350	2.239
		Babble	2.156	.052	242.350	2.053
5	No Processing	SSN	2.061	.052	242.350	1.959
		Babble	1.870	.052	242.350	1.767

# Estimates<sup>a</sup>

SNR	Program	Noise_Type	95% ... Upper Bound
-5	No Processing	SSN	1.482
		Babble	1.607
	Beam	SSN	1.542
		Babble	1.662
	Beam + NoiseBlock	SSN	1.570
		Babble	1.732
	DNN	SSN	1.783
		Babble	1.747
	NoiseBlock	SSN	1.574
		Babble	1.645
	Beam + DNN	SSN	2.028
		Babble	1.888
0	No Processing	SSN	1.768
		Babble	1.742
	Beam	SSN	1.866
		Babble	1.885
	Beam + NoiseBlock	SSN	1.946
		Babble	1.927
	DNN	SSN	2.144
		Babble	1.933
	NoiseBlock	SSN	1.928
		Babble	1.826
	Beam + DNN	SSN	2.445
		Babble	2.259
5	No Processing	SSN	2.164
		Babble	1.972

### Estimates<sup>a</sup>

SNR	Program	Noise_Type	Mean	Std. Error	df	95% ... Lower Bound
	Beam	SSN	2.162	.052	242.350	2.060
		Babble	2.129	.052	242.350	2.026
	Beam + NoiseBlock	SSN	2.267	.052	242.350	2.164
		Babble	2.143	.052	242.350	2.040
	DNN	SSN	2.526	.052	242.350	2.423
		Babble	2.151	.052	242.350	2.048
	NoiseBlock	SSN	2.283	.052	242.350	2.181
		Babble	2.020	.052	242.350	1.918
	Beam + DNN	SSN	2.818	.052	242.350	2.715
		Babble	2.479	.052	242.350	2.376

### Estimates<sup>a</sup>

SNR	Program	Noise_Type	95% ... Upper Bound
	Beam	SSN	2.265
		Babble	2.231
	Beam + NoiseBlock	SSN	2.369
		Babble	2.245
	DNN	SSN	2.628
		Babble	2.253
	NoiseBlock	SSN	2.386
		Babble	2.123
	Beam + DNN	SSN	2.920
		Babble	2.581

a. Dependent Variable: pMOS.

### Pairwise Comparisons<sup>a</sup>

SNR	Noise_Type	(I) Program	(J) Program	Mean Difference (I-J)	Std. Error	df
-5	SSN	No Processing	Beam	-.060	.071	1113.000
			Beam + NoiseBlock	-.088	.071	1113.000
			DNN	-.302*	.071	1113.000
			NoiseBlock	-.093	.071	1113.000
			Beam + DNN	-.547*	.071	1113.000
		Beam	No Processing	.060	.071	1113.000
			Beam + NoiseBlock	-.028	.071	1113.000
			DNN	-.242*	.071	1113.000
			NoiseBlock	-.033	.071	1113.000
			Beam + DNN	-.487*	.071	1113.000
		Beam + NoiseBlock	No Processing	.088	.071	1113.000
			Beam	.028	.071	1113.000
			DNN	-.213*	.071	1113.000
			NoiseBlock	-.004	.071	1113.000
			Beam + DNN	-.458*	.071	1113.000
		DNN	No Processing	.302*	.071	1113.000
			Beam	.242*	.071	1113.000
			Beam + NoiseBlock	.213*	.071	1113.000
			NoiseBlock	.209*	.071	1113.000
			Beam + DNN	-.245*	.071	1113.000
		NoiseBlock	No Processing	.093	.071	1113.000
			Beam	.033	.071	1113.000
			Beam + NoiseBlock	.004	.071	1113.000
			DNN	-.209*	.071	1113.000
			Beam + DNN	-.454*	.071	1113.000
		Beam + DNN	No Processing	.547*	.071	1113.000
			Beam	.487*	.071	1113.000
			Beam + NoiseBlock	.458*	.071	1113.000
			DNN	.245*	.071	1113.000
			NoiseBlock	.454*	.071	1113.000
	Babble	No Processing	Beam	-.055	.071	1113.000
			Beam + NoiseBlock	-.125	.071	1113.000
			DNN	-.140	.071	1113.000
			NoiseBlock	-.038	.071	1113.000
			Beam + DNN	-.281*	.071	1113.000

### Pairwise Comparisons<sup>a</sup>

SNR	Noise_Type	(I) Program	(J) Program	Sig. <sup>c</sup>	95% Confidence Interval for $\bar{C}_{ij}$
					Lower Bound
-5	SSN	No Processing	Beam	1.000	-.268
			Beam + NoiseBlock	1.000	-.297
			DNN	<.001	-.510
			NoiseBlock	1.000	-.301
			Beam + DNN	<.001	-.755
		Beam	No Processing	1.000	-.148
			Beam + NoiseBlock	1.000	-.237
			DNN	.010	-.450
			NoiseBlock	1.000	-.241
			Beam + DNN	<.001	-.695
		Beam + NoiseBlock	No Processing	1.000	-.120
			Beam	1.000	-.180
			DNN	.040	-.421
			NoiseBlock	1.000	-.212
			Beam + DNN	<.001	-.667
		DNN	No Processing	<.001	.093
			Beam	.010	.033
			Beam + NoiseBlock	.040	.005
			NoiseBlock	.048	.001
			Beam + DNN	.008	-.453
		NoiseBlock	No Processing	1.000	-.116
			Beam	1.000	-.176
			Beam + NoiseBlock	1.000	-.204
			DNN	.048	-.417
			Beam + DNN	<.001	-.662
		Beam + DNN	No Processing	<.001	.338
			Beam	<.001	.279
			Beam + NoiseBlock	<.001	.250
			DNN	.008	.037
			NoiseBlock	<.001	.246
	Babble	No Processing	Beam	1.000	-.263
			Beam + NoiseBlock	1.000	-.333
			DNN	.727	-.348
			NoiseBlock	1.000	-.246
			Beam + DNN	.001	-.489

## Pairwise Comparisons<sup>a</sup>

SNR	Noise_Type	(I) Program	(J) Program	95% Confidence Interval for $\bar{c}_{ij}$
				Upper Bound
-5	SSN	No Processing	Beam	.148
			Beam + NoiseBlock	.120
			DNN	-.093
			NoiseBlock	.116
			Beam + DNN	-.338
		Beam	No Processing	.268
			Beam + NoiseBlock	.180
			DNN	-.033
			NoiseBlock	.176
			Beam + DNN	-.279
		Beam + NoiseBlock	No Processing	.297
			Beam	.237
			DNN	-.005
			NoiseBlock	.204
			Beam + DNN	-.250
		DNN	No Processing	.510
			Beam	.450
			Beam + NoiseBlock	.421
			NoiseBlock	.417
			Beam + DNN	-.037
		NoiseBlock	No Processing	.301
			Beam	.241
			Beam + NoiseBlock	.212
			DNN	-.001
			Beam + DNN	-.246
		Beam + DNN	No Processing	.755
			Beam	.695
			Beam + NoiseBlock	.667
			DNN	.453
			NoiseBlock	.662
	Babble	No Processing	Beam	.153
			Beam + NoiseBlock	.083
			DNN	.068
			NoiseBlock	.170
			Beam + DNN	-.072



### Pairwise Comparisons<sup>a</sup>

SNR	Noise_Type	(I) Program	(J) Program	Mean Difference (I-J)	Std. Error	df
		Beam	No Processing	.055	.071	1113.000
			Beam + NoiseBlock	-.070	.071	1113.000
			DNN	-.085	.071	1113.000
			NoiseBlock	.017	.071	1113.000
			Beam + DNN	-.226 <sup>*</sup>	.071	1113.000
		Beam + NoiseBlock	No Processing	.125	.071	1113.000
			Beam	.070	.071	1113.000
			DNN	-.015	.071	1113.000
			NoiseBlock	.087	.071	1113.000
			Beam + DNN	-.156	.071	1113.000
		DNN	No Processing	.140	.071	1113.000
			Beam	.085	.071	1113.000
			Beam + NoiseBlock	.015	.071	1113.000
			NoiseBlock	.102	.071	1113.000
			Beam + DNN	-.141	.071	1113.000
		NoiseBlock	No Processing	.038	.071	1113.000
			Beam	-.017	.071	1113.000
			Beam + NoiseBlock	-.087	.071	1113.000
			DNN	-.102	.071	1113.000
			Beam + DNN	-.243 <sup>*</sup>	.071	1113.000
		Beam + DNN	No Processing	.281 <sup>*</sup>	.071	1113.000
			Beam	.226 <sup>*</sup>	.071	1113.000
			Beam + NoiseBlock	.156	.071	1113.000
			DNN	.141	.071	1113.000
			NoiseBlock	.243 <sup>*</sup>	.071	1113.000
0	SSN	No Processing	Beam	-.098	.071	1113.000
			Beam + NoiseBlock	-.178	.071	1113.000
			DNN	-.377 <sup>*</sup>	.071	1113.000
			NoiseBlock	-.160	.071	1113.000
			Beam + DNN	-.677 <sup>*</sup>	.071	1113.000
		Beam	No Processing	.098	.071	1113.000
			Beam + NoiseBlock	-.080	.071	1113.000
			DNN	-.279 <sup>*</sup>	.071	1113.000
			NoiseBlock	-.062	.071	1113.000
			Beam + DNN	-.579 <sup>*</sup>	.071	1113.000

# Pairwise Comparisons<sup>a</sup>

SNR	Noise_Type	(I) Program	(J) Program	Sig. <sup>c</sup>	95% Confidence Interval for <sup>c</sup> ...
					Lower Bound
		Beam	No Processing	1.000	-.153
			Beam + NoiseBlock	1.000	-.278
			DNN	1.000	-.293
			NoiseBlock	1.000	-.191
			Beam + DNN	.022	-.434
		Beam + NoiseBlock	No Processing	1.000	-.083
			Beam	1.000	-.139
			DNN	1.000	-.223
			NoiseBlock	1.000	-.121
			Beam + DNN	.418	-.364
		DNN	No Processing	.727	-.068
			Beam	1.000	-.124
			Beam + NoiseBlock	1.000	-.193
			NoiseBlock	1.000	-.106
			Beam + DNN	.703	-.349
		NoiseBlock	No Processing	1.000	-.170
			Beam	1.000	-.225
			Beam + NoiseBlock	1.000	-.295
			DNN	1.000	-.310
			Beam + DNN	.009	-.451
		Beam + DNN	No Processing	.001	.072
			Beam	.022	.017
			Beam + NoiseBlock	.418	-.052
			DNN	.703	-.067
			NoiseBlock	.009	.034
0	SSN	No Processing	Beam	1.000	-.306
			Beam + NoiseBlock	.181	-.386
			DNN	<.001	-.585
			NoiseBlock	.355	-.369
			Beam + DNN	<.001	-.885
		Beam	No Processing	1.000	-.110
			Beam + NoiseBlock	1.000	-.288
			DNN	.001	-.487
			NoiseBlock	1.000	-.271
			Beam + DNN	<.001	-.787

## Pairwise Comparisons<sup>a</sup>

				95% Confidence Interval for $\bar{c}_{ij}$
SNR	Noise_Type	(I) Program	(J) Program	Upper Bound
		Beam	No Processing	.263
			Beam + NoiseBlock	.139
			DNN	.124
			NoiseBlock	.225
			Beam + DNN	-.017
		Beam + NoiseBlock	No Processing	.333
			Beam	.278
			DNN	.193
			NoiseBlock	.295
			Beam + DNN	.052
		DNN	No Processing	.348
			Beam	.293
			Beam + NoiseBlock	.223
			NoiseBlock	.310
			Beam + DNN	.067
		NoiseBlock	No Processing	.246
			Beam	.191
			Beam + NoiseBlock	.121
			DNN	.106
			Beam + DNN	-.034
		Beam + DNN	No Processing	.489
			Beam	.434
			Beam + NoiseBlock	.364
			DNN	.349
			NoiseBlock	.451
0	SSN	No Processing	Beam	.110
			Beam + NoiseBlock	.030
			DNN	-.169
			NoiseBlock	.048
			Beam + DNN	-.469
		Beam	No Processing	.306
			Beam + NoiseBlock	.128
			DNN	-.071
			NoiseBlock	.146
			Beam + DNN	-.371

# Pairwise Comparisons<sup>a</sup>

SNR	Noise_Type	(I) Program	(J) Program	Mean Difference (I-J)	Std. Error	df
		Beam + NoiseBlock	No Processing	.178	.071	1113.000
			Beam	.080	.071	1113.000
			DNN	-.199	.071	1113.000
			NoiseBlock	.018	.071	1113.000
			Beam + DNN	-.499*	.071	1113.000
		DNN	No Processing	.377*	.071	1113.000
			Beam	.279*	.071	1113.000
			Beam + NoiseBlock	.199	.071	1113.000
			NoiseBlock	.216*	.071	1113.000
			Beam + DNN	-.300*	.071	1113.000
		NoiseBlock	No Processing	.160	.071	1113.000
			Beam	.062	.071	1113.000
			Beam + NoiseBlock	-.018	.071	1113.000
			DNN	-.216*	.071	1113.000
			Beam + DNN	-.516*	.071	1113.000
		Beam + DNN	No Processing	.677*	.071	1113.000
			Beam	.579*	.071	1113.000
			Beam + NoiseBlock	.499*	.071	1113.000
			DNN	.300*	.071	1113.000
			NoiseBlock	.516*	.071	1113.000
Babble		No Processing	Beam	-.143	.071	1113.000
			Beam + NoiseBlock	-.185	.071	1113.000
			DNN	-.192	.071	1113.000
			NoiseBlock	-.085	.071	1113.000
			Beam + DNN	-.517*	.071	1113.000
		Beam	No Processing	.143	.071	1113.000
			Beam + NoiseBlock	-.042	.071	1113.000
			DNN	-.049	.071	1113.000
			NoiseBlock	.058	.071	1113.000
			Beam + DNN	-.374*	.071	1113.000
		Beam + NoiseBlock	No Processing	.185	.071	1113.000
			Beam	.042	.071	1113.000
			DNN	-.006	.071	1113.000
			NoiseBlock	.101	.071	1113.000
			Beam + DNN	-.332*	.071	1113.000

### Pairwise Comparisons<sup>a</sup>

SNR	Noise_Type	(I) Program	(J) Program	Sig. <sup>c</sup>	95% Confidence Interval for <sup>c</sup> ...
					Lower Bound
		Beam + NoiseBlock	No Processing	.181	-.030
			Beam	1.000	-.128
			DNN	.076	-.407
			NoiseBlock	1.000	-.191
			Beam + DNN	<.001	-.707
		DNN	No Processing	<.001	.169
			Beam	.001	.071
			Beam + NoiseBlock	.076	-.009
			NoiseBlock	.034	.008
			Beam + DNN	<.001	-.508
		NoiseBlock	No Processing	.355	-.048
			Beam	1.000	-.146
			Beam + NoiseBlock	1.000	-.226
			DNN	.034	-.425
			Beam + DNN	<.001	-.725
		Beam + DNN	No Processing	<.001	.469
			Beam	<.001	.371
			Beam + NoiseBlock	<.001	.291
			DNN	<.001	.092
			NoiseBlock	<.001	.308
	Babble	No Processing	Beam	.653	-.351
			Beam + NoiseBlock	.135	-.394
			DNN	.103	-.400
			NoiseBlock	1.000	-.293
			Beam + DNN	<.001	-.725
		Beam	No Processing	.653	-.065
			Beam + NoiseBlock	1.000	-.251
			DNN	1.000	-.257
			NoiseBlock	1.000	-.150
			Beam + DNN	<.001	-.582
		Beam + NoiseBlock	No Processing	.135	-.023
			Beam	1.000	-.166
			DNN	1.000	-.215
			NoiseBlock	1.000	-.108
			Beam + DNN	<.001	-.540

## Pairwise Comparisons<sup>a</sup>

				95% Confidence Interval for <sup>c</sup> ...
SNR	Noise_Type	(I) Program	(J) Program	Upper Bound
		Beam + NoiseBlock	No Processing	.386
			Beam	.288
			DNN	.009
			NoiseBlock	.226
			Beam + DNN	-.291
		DNN	No Processing	.585
			Beam	.487
			Beam + NoiseBlock	.407
			NoiseBlock	.425
			Beam + DNN	-.092
		NoiseBlock	No Processing	.369
			Beam	.271
			Beam + NoiseBlock	.191
			DNN	-.008
			Beam + DNN	-.308
		Beam + DNN	No Processing	.885
			Beam	.787
			Beam + NoiseBlock	.707
			DNN	.508
			NoiseBlock	.725
Babble		No Processing	Beam	.065
			Beam + NoiseBlock	.023
			DNN	.017
			NoiseBlock	.124
			Beam + DNN	-.309
		Beam	No Processing	.351
			Beam + NoiseBlock	.166
			DNN	.160
			NoiseBlock	.267
			Beam + DNN	-.166
		Beam + NoiseBlock	No Processing	.394
			Beam	.251
			DNN	.202
			NoiseBlock	.309
			Beam + DNN	-.123

### Pairwise Comparisons<sup>a</sup>

SNR	Noise_Type	(I) Program	(J) Program	Mean Difference (I-J)	Std. Error	df
		DNN	No Processing	.192	.071	1113.000
			Beam	.049	.071	1113.000
			Beam + NoiseBlock	.006	.071	1113.000
			NoiseBlock	.107	.071	1113.000
			Beam + DNN	-.325*	.071	1113.000
		NoiseBlock	No Processing	.085	.071	1113.000
			Beam	-.058	.071	1113.000
			Beam + NoiseBlock	-.101	.071	1113.000
			DNN	-.107	.071	1113.000
			Beam + DNN	-.432*	.071	1113.000
		Beam + DNN	No Processing	.517*	.071	1113.000
			Beam	.374*	.071	1113.000
			Beam + NoiseBlock	.332*	.071	1113.000
			DNN	.325*	.071	1113.000
			NoiseBlock	.432*	.071	1113.000
5	SSN	No Processing	Beam	-.101	.071	1113.000
			Beam + NoiseBlock	-.205	.071	1113.000
			DNN	-.465*	.071	1113.000
			NoiseBlock	-.222*	.071	1113.000
			Beam + DNN	-.757*	.071	1113
		Beam	No Processing	.101	.071	1113.000
			Beam + NoiseBlock	-.104	.071	1113.000
			DNN	-.363*	.071	1113.000
			NoiseBlock	-.121	.071	1113.000
			Beam + DNN	-.655*	.071	1113
		Beam + NoiseBlock	No Processing	.205	.071	1113.000
			Beam	.104	.071	1113.000
			DNN	-.259*	.071	1113.000
			NoiseBlock	-.017	.071	1113.000
			Beam + DNN	-.551*	.071	1113
		DNN	No Processing	.465*	.071	1113.000
			Beam	.363*	.071	1113.000
			Beam + NoiseBlock	.259*	.071	1113.000
			NoiseBlock	.242*	.071	1113.000
			Beam + DNN	-.292*	.071	1113

### Pairwise Comparisons<sup>a</sup>

SNR	Noise_Type	(I) Program	(J) Program	Sig. <sup>c</sup>	95% Confidence Interval for $\bar{C}_{ij}$
					Lower Bound
		DNN	No Processing	.103	-.017
			Beam	1.000	-.160
			Beam + NoiseBlock	1.000	-.202
			NoiseBlock	1.000	-.101
			Beam + DNN	<.001	-.534
		NoiseBlock	No Processing	1.000	-.124
			Beam	1.000	-.267
			Beam + NoiseBlock	1.000	-.309
			DNN	1.000	-.315
			Beam + DNN	<.001	-.641
		Beam + DNN	No Processing	<.001	.309
			Beam	<.001	.166
			Beam + NoiseBlock	<.001	.123
			DNN	<.001	.117
			NoiseBlock	<.001	.224
5	SSN	No Processing	Beam	1.000	-.310
			Beam + NoiseBlock	.057	-.414
			DNN	<.001	-.673
			NoiseBlock	.026	-.431
			Beam + DNN	<.001	-.965
		Beam	No Processing	1.000	-.107
			Beam + NoiseBlock	1.000	-.312
			DNN	<.001	-.572
			NoiseBlock	1.000	-.329
			Beam + DNN	<.001	-.863
		Beam + NoiseBlock	No Processing	.057	-.003
			Beam	1.000	-.104
			DNN	.004	-.467
			NoiseBlock	1.000	-.225
			Beam + DNN	<.001	-.759
		DNN	No Processing	<.001	.256
			Beam	<.001	.155
			Beam + NoiseBlock	.004	.051
			NoiseBlock	.010	.034
			Beam + DNN	<.001	-.500



## Pairwise Comparisons<sup>a</sup>

				95% Confidence Interval for $\bar{c}_{ij}$
SNR	Noise_Type	(I) Program	(J) Program	Upper Bound
		DNN	No Processing	.400
			Beam	.257
			Beam + NoiseBlock	.215
			NoiseBlock	.315
			Beam + DNN	-.117
		NoiseBlock	No Processing	.293
			Beam	.150
			Beam + NoiseBlock	.108
			DNN	.101
			Beam + DNN	-.224
		Beam + DNN	No Processing	.725
			Beam	.582
			Beam + NoiseBlock	.540
			DNN	.534
			NoiseBlock	.641
5	SSN	No Processing	Beam	.107
			Beam + NoiseBlock	.003
			DNN	-.256
			NoiseBlock	-.014
			Beam + DNN	-.548
		Beam	No Processing	.310
			Beam + NoiseBlock	.104
			DNN	-.155
			NoiseBlock	.087
			Beam + DNN	-.447
		Beam + NoiseBlock	No Processing	.414
			Beam	.312
			DNN	-.051
			NoiseBlock	.191
			Beam + DNN	-.343
		DNN	No Processing	.673
			Beam	.572
			Beam + NoiseBlock	.467
			NoiseBlock	.451
			Beam + DNN	-.084

### Pairwise Comparisons<sup>a</sup>

SNR	Noise_Type	(I) Program	(J) Program	Mean Difference (I-J)	Std. Error	df
	NoiseBlock	NoiseBlock	No Processing	.222 <sup>*</sup>	.071	1113.000
			Beam	.121	.071	1113.000
			Beam + NoiseBlock	.017	.071	1113.000
			DNN	-.242 <sup>*</sup>	.071	1113.000
			Beam + DNN	-.534 <sup>*</sup>	.071	1113
		Beam + DNN	No Processing	.757 <sup>*</sup>	.071	1113
			Beam	.655 <sup>*</sup>	.071	1113
			Beam + NoiseBlock	.551 <sup>*</sup>	.071	1113
			DNN	.292 <sup>*</sup>	.071	1113
			NoiseBlock	.534 <sup>*</sup>	.071	1113
	Babble	No Processing	Beam	-.259 <sup>*</sup>	.071	1113
			Beam + NoiseBlock	-.273 <sup>*</sup>	.071	1113
			DNN	-.281 <sup>*</sup>	.071	1113
			NoiseBlock	-.151	.071	1113
			Beam + DNN	-.609 <sup>*</sup>	.071	1113.000
		Beam	No Processing	.259 <sup>*</sup>	.071	1113
			Beam + NoiseBlock	-.014	.071	1113
			DNN	-.022	.071	1113
			NoiseBlock	.108	.071	1113
			Beam + DNN	-.350 <sup>*</sup>	.071	1113.000
		Beam + NoiseBlock	No Processing	.273 <sup>*</sup>	.071	1113
			Beam	.014	.071	1113
			DNN	-.008	.071	1113
			NoiseBlock	.122	.071	1113
			Beam + DNN	-.336 <sup>*</sup>	.071	1113.000
		DNN	No Processing	.281 <sup>*</sup>	.071	1113
			Beam	.022	.071	1113
			Beam + NoiseBlock	.008	.071	1113
			NoiseBlock	.130	.071	1113
			Beam + DNN	-.328 <sup>*</sup>	.071	1113.000
		NoiseBlock	No Processing	.151	.071	1113
			Beam	-.108	.071	1113
			Beam + NoiseBlock	-.122	.071	1113
			DNN	-.130	.071	1113
			Beam + DNN	-.458 <sup>*</sup>	.071	1113.000

### Pairwise Comparisons<sup>a</sup>

SNR	Noise_Type	(I) Program	(J) Program	Sig. <sup>c</sup>	95% Confidence Interval for <sup>c</sup> .. Lower Bound
	NoiseBlock	NoiseBlock	No Processing	.026	.014
			Beam	1.000	-.087
			Beam + NoiseBlock	1.000	-.191
			DNN	.010	-.451
			Beam + DNN	<.001	-.742
		Beam + DNN	No Processing	<.001	.548
			Beam	<.001	.447
			Beam + NoiseBlock	<.001	.343
			DNN	<.001	.084
			NoiseBlock	<.001	.326
	Babble	No Processing	Beam	.004	-.467
			Beam + NoiseBlock	.002	-.481
			DNN	.001	-.489
			NoiseBlock	.501	-.359
			Beam + DNN	<.001	-.817
		Beam	No Processing	.004	.051
			Beam + NoiseBlock	1.000	-.222
			DNN	1.000	-.230
			NoiseBlock	1.000	-.100
			Beam + DNN	<.001	-.558
		Beam + NoiseBlock	No Processing	.002	.065
			Beam	1.000	-.194
			DNN	1.000	-.216
			NoiseBlock	1.000	-.086
			Beam + DNN	<.001	-.544
		DNN	No Processing	.001	.073
			Beam	1.000	-.187
			Beam + NoiseBlock	1.000	-.200
			NoiseBlock	.994	-.078
			Beam + DNN	<.001	-.536
		NoiseBlock	No Processing	.501	-.057
			Beam	1.000	-.317
			Beam + NoiseBlock	1.000	-.331
			DNN	.994	-.338
			Beam + DNN	<.001	-.666

## Pairwise Comparisons<sup>a</sup>

				95% Confidence Interval for $\bar{c}_{ij}$
SNR	Noise_Type	(I) Program	(J) Program	Upper Bound
		NoiseBlock	No Processing	.431
			Beam	.329
			Beam + NoiseBlock	.225
			DNN	-.034
			Beam + DNN	-.326
		Beam + DNN	No Processing	.965
			Beam	.863
			Beam + NoiseBlock	.759
			DNN	.500
			NoiseBlock	.742
	Babble	No Processing	Beam	-.051
			Beam + NoiseBlock	-.065
			DNN	-.073
			NoiseBlock	.057
			Beam + DNN	-.401
		Beam	No Processing	.467
			Beam + NoiseBlock	.194
			DNN	.187
			NoiseBlock	.317
			Beam + DNN	-.141
		Beam + NoiseBlock	No Processing	.481
			Beam	.222
			DNN	.200
			NoiseBlock	.331
			Beam + DNN	-.128
		DNN	No Processing	.489
			Beam	.230
			Beam + NoiseBlock	.216
			NoiseBlock	.338
			Beam + DNN	-.120
		NoiseBlock	No Processing	.359
			Beam	.100
			Beam + NoiseBlock	.086
			DNN	.078
			Beam + DNN	-.250

### Pairwise Comparisons<sup>a</sup>

SNR	Noise_Type	(I) Program	(J) Program	Mean Difference (I-J)	Std. Error	df
		Beam + DNN	No Processing	.609 <sup>*</sup>	.071	1113.000
			Beam	.350 <sup>*</sup>	.071	1113.000
			Beam + NoiseBlock	.336 <sup>*</sup>	.071	1113.000
			DNN	.328 <sup>*</sup>	.071	1113.000
			NoiseBlock	.458 <sup>*</sup>	.071	1113.000

### Pairwise Comparisons<sup>a</sup>

SNR	Noise_Type	(I) Program	(J) Program	Sig. <sup>c</sup>	95% Confidence Interval for <sup>c</sup> ... Lower Bound
		Beam + DNN	No Processing	<.001	.401
			Beam	<.001	.141
			Beam + NoiseBlock	<.001	.128
			DNN	<.001	.120
			NoiseBlock	<.001	.250

### Pairwise Comparisons<sup>a</sup>

SNR	Noise_Type	(I) Program	(J) Program	95% Confidence Interval for <sup>c</sup> ... Upper Bound
		Beam + DNN	No Processing	.817
			Beam	.558
			Beam + NoiseBlock	.544
			DNN	.536
			NoiseBlock	.666

Based on estimated marginal means

\*. The mean difference is significant at the .05 level.

a. Dependent Variable: pMOS.

c. Adjustment for multiple comparisons: Bonferroni.

### Univariate Tests<sup>a</sup>

SNR	Noise_Type	Numerator df	Denominator df	F	Sig.
-5	SSN	5	1113.000	16.926	<.001
	Babble	5	1113.000	4.027	.001
0	SSN	5	1113.000	23.705	<.001
	Babble	5	1113.000	12.471	<.001
5	SSN	5	1113.000	30.290	<.001
	Babble	5	1113.000	16.106	<.001

Each F tests the simple effects of Program within each level combination of the other effects shown. These tests are based on the linearly independent pairwise comparisons among the estimated marginal means.

a. Dependent Variable: pMOS.