

# Electronic supplementary material

Table S1 : Anova table of all models computed. The function ‘Anova’ from the ‘car’ R package was used to generate p value on full models. Interpretable significant p-values are bolded. When significant interaction were found, post hoc tests were performed (see table S2).

| Fixed effects  | Chisq   | Df | Pr..Chisq.       |
|--|---------|----|------------------|
| <b>Model #1 : behavioural response Reunion of the Isolation/Reunion test</b>                     |         |    |                  |
| <b>ReuPC1</b>  |         |    |                  |
| Treatment  | 19.077  | 1  | <0.001           |
| Conditioning time  | 139.035 | 1  | <0.001           |
| Batch  | 42.566  | 1  | <0.001           |
| HumanID  | 0.137   | 1  | 0.711            |
| Treatment:Conditioning time  | 27.910  | 1  | <b>&lt;0.001</b> |
| Treatment:Batch  | 0.507   | 1  | 0.476            |
| Treatment:HumanID  | 6.009   | 1  | <b>0.014</b>     |
| Conditioning time:Batch  | 20.240  | 1  | <b>&lt;0.001</b> |
| Conditioning time:HumanID  | 0.646   | 1  | 0.422            |
| <b>ReuPC2 (sqrt+4)</b>   |         |    |                  |
| Treatment  | 0.995   | 1  | 0.319            |
| Conditioning time  | 3.782   | 1  | 0.052            |
| Batch  | 5.118   | 1  | 0.024            |
| HumanID  | 1.978   | 1  | 0.160            |
| Treatment:Conditioning time  | 0.000   | 1  | 0.989            |
| Treatment:Batch  | 0.333   | 1  | 0.564            |
| Treatment:HumanID  | 1.752   | 1  | 0.186            |
| Conditioning time:Batch  | 14.193  | 1  | <b>&lt;0.001</b> |
| Conditioning time:HumanID  | 0.189   | 1  | 0.663            |
| <b>-ReuPC3 (sqrt +3)</b>   |         |    |                  |
| Treatment  | 6.884   | 1  | 0.009            |
| Conditioning time  | 31.456  | 1  | <0.001           |
| Batch  | 0.000   | 1  | 0.984            |
| HumanID  | 0.385   | 1  | 0.535            |
| Treatment:Conditioning time  | 3.658   | 1  | 0.056            |
| Treatment:Batch  | 6.966   | 1  | <b>0.008</b>     |
| Treatment:HumanID  | 2.010   | 1  | 0.156            |
| Conditioning time:Batch  | 5.445   | 1  | <b>0.020</b>     |
| Conditioning time:HumanID  | 0.247   | 1  | 0.619            |
| <b>Model #2 : Vocal response Isolation/Reunion tests : Treatment * Phase * Conditioning time</b> |         |    |                  |
| <b>Call duration (s) (log)</b>   |         |    |                  |
| Treatment  | 5.503   | 1  | <b>0.019</b>     |
| Phase  | 60.842  | 1  | <b>&lt;0.001</b> |
| Conditioning time  | 62.883  | 1  | <0.001           |
| HumanID  | 0.535   | 1  | 0.465            |

|                                   |        |   |              |
|-----------------------------------|--------|---|--------------|
| Batch                             | 8.053  | 1 | 0.005        |
| Treatment:Phase                   | 0.872  | 1 | 0.350        |
| Treatment:Conditioning time       | 3.479  | 1 | 0.062        |
| Phase:Conditioning time           | 1.894  | 1 | 0.169        |
| Treatment:HumanID                 | 0.048  | 1 | 0.826        |
| Conditioning time:HumanID         | 2.347  | 1 | 0.126        |
| Treatment:Batch                   | 2.398  | 1 | 0.121        |
| Conditioning time:Batch           | 10.844 | 1 | <b>0.001</b> |
| Treatment:Phase:Conditioning time | 0.699  | 1 | 0.403        |

**-VocPC1**

|                                   |        |   |                  |
|-----------------------------------|--------|---|------------------|
| Treatment                         | 0.886  | 1 | 0.346            |
| Phase                             | 8.501  | 1 | <b>0.004</b>     |
| Conditioning time                 | 0.359  | 1 | 0.549            |
| HumanID                           | 2.519  | 1 | 0.112            |
| Batch                             | 60.781 | 1 | <b>&lt;0.001</b> |
| Treatment:Phase                   | 0.735  | 1 | 0.391            |
| Treatment:Conditioning time       | 0.592  | 1 | 0.442            |
| Phase:Conditioning time           | 0.616  | 1 | 0.433            |
| Treatment:HumanID                 | 0.095  | 1 | 0.758            |
| Conditioning time:HumanID         | 0.786  | 1 | 0.375            |
| Treatment:Batch                   | 0.129  | 1 | 0.720            |
| Conditioning time:Batch           | 1.875  | 1 | 0.171            |
| Treatment:Phase:Conditioning time | 0.000  | 1 | 0.995            |

**VocPC2**

|                                   |         |   |                  |
|-----------------------------------|---------|---|------------------|
| Treatment                         | 0.011   | 1 | 0.918            |
| Phase                             | 19.116  | 1 | <b>&lt;0.001</b> |
| Conditioning time                 | 245.911 | 1 | <b>&lt;0.001</b> |
| HumanID                           | 6.152   | 1 | <b>0.013</b>     |
| Batch                             | 2.378   | 1 | 0.123            |
| Treatment:Phase                   | 3.525   | 1 | 0.060            |
| Treatment:Conditioning time       | 0.695   | 1 | 0.405            |
| Phase:Conditioning time           | 2.105   | 1 | 0.147            |
| Treatment:HumanID                 | 0.280   | 1 | 0.597            |
| Conditioning time:HumanID         | 0.032   | 1 | 0.858            |
| Treatment:Batch                   | 0.355   | 1 | 0.552            |
| Conditioning time:Batch           | 34.561  | 1 | <b>&lt;0.001</b> |
| Treatment:Phase:Conditioning time | 0.314   | 1 | 0.576            |

**-VocPC3**

|                             |        |   |                  |
|-----------------------------|--------|---|------------------|
| Treatment                   | 4.782  | 1 | <b>0.029</b>     |
| Phase                       | 6.567  | 1 | <b>0.010</b>     |
| Conditioning time           | 2.945  | 1 | 0.086            |
| HumanID                     | 0.870  | 1 | 0.351            |
| Batch                       | 50.730 | 1 | <b>&lt;0.001</b> |
| Treatment:Phase             | 0.721  | 1 | 0.396            |
| Treatment:Conditioning time | 0.102  | 1 | 0.750            |
| Phase:Conditioning time     | 2.026  | 1 | 0.155            |
| Treatment:HumanID           | 0.087  | 1 | 0.767            |
| Conditioning time:HumanID   | 2.002  | 1 | 0.157            |
| Treatment:Batch             | 1.905  | 1 | 0.168            |

|                                   |       |   |              |
|-----------------------------------|-------|---|--------------|
| Conditioning time:Batch           | 8.468 | 1 | <b>0.004</b> |
| Treatment:Phase:Conditioning time | 0.624 | 1 | 0.429        |

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**Model #3 : Vocal response Reunion of the Isolation/Reunion tests : conditioning time \* Treatment \* In prox. area**

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**Call duration (s) (log)**

|   |        |   |                  |
|---|--------|---|------------------|
| Conditioning time                         | 37.742 | 1 | <0.001           |
| Treatment                                 | 0.943  | 1 | 0.331            |
| In prox. area                             | 48.590 | 1 | <0.001           |
| HumanID                                   | 2.208  | 1 | 0.137            |
| Batch                                     | 4.987  | 1 | 0.026            |
| Conditioning time:Treatment               | 1.892  | 1 | 0.169            |
| Conditioning time:In prox. area           | 4.913  | 1 | 0.027            |
| Treatment:In prox. area                   | 16.021 | 1 | <0.001           |
| Conditioning time:HumanID                 | 0.526  | 1 | 0.468            |
| Conditioning time:Batch                   | 29.430 | 1 | <b>&lt;0.001</b> |
| Treatment:Batch                           | 0.172  | 1 | 0.678            |
| Treatment:HumanID                         | 0.004  | 1 | 0.947            |
| In prox. area:HumanID                     | 2.058  | 1 | 0.151            |
| In prox. area:Batch                       | 0.010  | 1 | 0.919            |
| Conditioning time:Treatment:In prox. area | 6.541  | 1 | <b>0.011</b>     |

**-VocPC1**

|   |        |   |                  |
|---|--------|---|------------------|
| Conditioning time                         | 0.391  | 1 | 0.532            |
| Treatment                                 | 0.026  | 1 | 0.873            |
| In prox. area                             | 0.973  | 1 | 0.324            |
| HumanID                                   | 3.006  | 1 | 0.083            |
| Batch                                     | 36.673 | 1 | <b>&lt;0.001</b> |
| Conditioning time:Treatment               | 0.802  | 1 | 0.371            |
| Conditioning time:In prox. area           | 0.600  | 1 | 0.439            |
| Treatment:In prox. area                   | 14.375 | 1 | <0.001           |
| Conditioning time:HumanID                 | 0.261  | 1 | 0.609            |
| Conditioning time:Batch                   | 3.911  | 1 | 0.048            |
| Treatment:Batch                           | 1.671  | 1 | 0.196            |
| Treatment:HumanID                         | 0.272  | 1 | 0.602            |
| In prox. area:HumanID                     | 2.024  | 1 | 0.155            |
| In prox. area:Batch                       | 2.939  | 1 | 0.086            |
| Conditioning time:Treatment:In prox. area | 4.987  | 1 | <b>0.026</b>     |

**VocPC2**

|                                 |         |   |                  |
|---------------------------------|---------|---|------------------|
| Conditioning time               | 110.726 | 1 | <0.001           |
| Treatment                       | 0.351   | 1 | 0.554            |
| In prox. area                   | 26.883  | 1 | <0.001           |
| HumanID                         | 4.938   | 1 | <b>0.026</b>     |
| Batch                           | 2.275   | 1 | 0.131            |
| Conditioning time:Treatment     | 0.016   | 1 | 0.900            |
| Conditioning time:In prox. area | 10.339  | 1 | <b>0.001</b>     |
| Treatment:In prox. area         | 4.225   | 1 | <b>0.040</b>     |
| Conditioning time:HumanID       | 0.037   | 1 | 0.848            |
| Conditioning time:Batch         | 37.624  | 1 | <b>&lt;0.001</b> |
| Treatment:Batch                 | 0.342   | 1 | 0.559            |

|   |       |   |              |
|---|-------|---|--------------|
| Treatment:HumanID                         | 0.403 | 1 | 0.525        |
| In prox. area:HumanID                     | 0.020 | 1 | 0.887        |
| In prox. area:Batch                       | 8.818 | 1 | <b>0.003</b> |
| Conditioning time:Treatment:In prox. area | 3.353 | 1 | 0.067        |

#### **-VocPC3**

|   |        |   |              |
|---|--------|---|--------------|
| Conditioning time                         | 6.221  | 1 | 0.013        |
| Treatment                                 | 3.158  | 1 | 0.076        |
| In prox. area                             | 8.537  | 1 | 0.003        |
| HumanID                                   | 1.180  | 1 | 0.277        |
| Batch                                     | 40.179 | 1 | <0.001       |
| Conditioning time:Treatment               | 0.371  | 1 | 0.542        |
| Conditioning time:In prox. area           | 3.245  | 1 | 0.072        |
| Treatment:In prox. area                   | 1.308  | 1 | 0.253        |
| Conditioning time:HumanID                 | 0.154  | 1 | 0.695        |
| Conditioning time:Batch                   | 8.632  | 1 | <b>0.003</b> |
| Treatment:Batch                           | 2.241  | 1 | 0.134        |
| Treatment:HumanID                         | 0.046  | 1 | 0.830        |
| In prox. area:HumanID                     | 2.982  | 1 | 0.084        |
| In prox. area:Batch                       | 10.363 | 1 | <b>0.001</b> |
| Conditioning time:Treatment:In prox. area | 4.893  | 1 | <b>0.027</b> |

#### **Model #4 : Behavioural response during sessions of conditioning**

##### **CondPC1**

|                        |        |   |                |
|------------------------|--------|---|----------------|
| Trial number           | 59.317 | 1 | < <b>0.001</b> |
| Treatment              | 0.128  | 1 | 0.721          |
| HumanID                | 1.320  | 1 | 0.251          |
| Batch                  | 14.497 | 1 | < <b>0.001</b> |
| Trial number:Treatment | 2.545  | 1 | 0.111          |
| Trial number:HumanID   | 0.023  | 1 | 0.880          |
| Trial number:Batch     | 0.626  | 1 | 0.429          |
| Treatment:Batch        | 1.663  | 1 | 0.197          |
| Treatment:HumanID      | 0.437  | 1 | 0.508          |

##### **CondPC2**

|                        |        |   |                |
|------------------------|--------|---|----------------|
| Trial number           | 48.618 | 1 | < <b>0.001</b> |
| Treatment              | 12.806 | 1 | < <b>0.001</b> |
| HumanID                | 0.226  | 1 | 0.635          |
| Batch                  | 10.056 | 1 | <b>0.002</b>   |
| Trial number:Treatment | 0.041  | 1 | 0.839          |
| Trial number:HumanID   | 0.000  | 1 | 0.999          |
| Trial number:Batch     | 0.085  | 1 | 0.771          |
| Treatment:Batch        | 2.007  | 1 | 0.157          |
| Treatment:HumanID      | 0.907  | 1 | 0.341          |

##### **CondPC3**

|                        |       |   |              |
|------------------------|-------|---|--------------|
| Trial number           | 0.006 | 1 | 0.939        |
| Treatment              | 6.969 | 1 | <b>0.008</b> |
| HumanID                | 0.375 | 1 | 0.541        |
| Batch                  | 0.015 | 1 | 0.903        |
| Trial number:Treatment | 0.616 | 1 | 0.432        |
| Trial number:HumanID   | 0.109 | 1 | 0.741        |

|                    |       |   |       |
|--------------------|-------|---|-------|
| Trial number:Batch | 0.166 | 1 | 0.684 |
| Treatment:Batch    | 0.078 | 1 | 0.780 |
| Treatment:HumanID  | 0.143 | 1 | 0.705 |

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**Missed contact attempts by Human ID (binomial)**

|                        |        |   |              |
|------------------------|--------|---|--------------|
| Trial number           | 23.159 | 1 | <0.001       |
| Treatment              | 9.563  | 1 | <b>0.002</b> |
| HumanID                | 0.463  | 1 | 0.496        |
| Batch                  | 12.833 | 1 | <0.001       |
| Trial number:Treatment | 0.218  | 1 | 0.640        |
| Trial number:HumanID   | 0.058  | 1 | 0.809        |
| Trial number:Batch     | 4.485  | 1 | <b>0.034</b> |
| Treatment:Batch        | 1.274  | 1 | 0.259        |
| Treatment:HumanID      | 1.073  | 1 | 0.300        |

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**Model #5 : Vocal response during session of conditioning : Trial number \* Treatment \* In prox. area**

**Call duration (s) (log)**

|                                      |         |   |                  |
|--------------------------------------|---------|---|------------------|
| Trial number                         | 48.880  | 1 | <0.001           |
| Treatment                            | 5.192   | 1 | 0.023            |
| In prox. area                        | 160.565 | 1 | <0.001           |
| HumanID                              | 0.090   | 1 | 0.765            |
| Batch                                | 11.814  | 1 | 0.001            |
| Trial number:Treatment               | 0.384   | 1 | 0.536            |
| Trial number:In prox. area           | 0.584   | 1 | 0.445            |
| Treatment:In prox. area              | 15.779  | 1 | <b>&lt;0.001</b> |
| Trial number:HumanID                 | 1.252   | 1 | 0.263            |
| Trial number:Batch                   | 5.374   | 1 | <b>0.020</b>     |
| Treatment:Batch                      | 6.716   | 1 | <b>0.010</b>     |
| Treatment:HumanID                    | 0.712   | 1 | 0.399            |
| In prox. area:HumanID                | 0.004   | 1 | 0.951            |
| In prox. area:Batch                  | 0.105   | 1 | 0.746            |
| Trial number:Treatment:In prox. area | 0.019   | 1 | 0.889            |

**-VocPC1**

|                                      |        |   |              |
|--------------------------------------|--------|---|--------------|
| Trial number                         | 12.233 | 1 | <0.001       |
| Treatment                            | 0.043  | 1 | 0.835        |
| In prox. area                        | 2.225  | 1 | 0.136        |
| HumanID                              | 4.696  | 1 | <b>0.030</b> |
| Batch                                | 62.339 | 1 | <0.001       |
| Trial number:Treatment               | 1.091  | 1 | 0.296        |
| Trial number:In prox. area           | 3.968  | 1 | <b>0.046</b> |
| Treatment:In prox. area              | 1.089  | 1 | 0.297        |
| Trial number:HumanID                 | 0.155  | 1 | 0.694        |
| Trial number:Batch                   | 0.099  | 1 | 0.753        |
| Treatment:Batch                      | 6.990  | 1 | <b>0.008</b> |
| Treatment:HumanID                    | 0.606  | 1 | 0.436        |
| In prox. area:HumanID                | 2.204  | 1 | 0.138        |
| In prox. area:Batch                  | 5.703  | 1 | <b>0.017</b> |
| Trial number:Treatment:In prox. area | 0.275  | 1 | 0.600        |

**VocPC2**

|              |        |   |        |
|--------------|--------|---|--------|
| Trial number | 85.956 | 1 | <0.001 |
|--------------|--------|---|--------|

|                                      |        |   |              |
|--------------------------------------|--------|---|--------------|
| Treatment                            | 0.217  | 1 | 0.642        |
| In prox. area                        | 13.440 | 1 | <0.001       |
| HumanID                              | 2.932  | 1 | 0.087        |
| Batch                                | 6.712  | 1 | 0.010        |
| Trial number:Treatment               | 0.507  | 1 | 0.477        |
| Trial number:In prox. area           | 6.107  | 1 | <b>0.013</b> |
| Treatment:In prox. area              | 7.622  | 1 | <b>0.006</b> |
| Trial number:HumanID                 | 0.016  | 1 | 0.899        |
| Trial number:Batch                   | 8.261  | 1 | <b>0.004</b> |
| Treatment:Batch                      | 1.482  | 1 | 0.223        |
| Treatment:HumanID                    | 2.318  | 1 | 0.128        |
| In prox. area:HumanID                | 11.895 | 1 | <b>0.001</b> |
| In prox. area:Batch                  | 1.792  | 1 | 0.181        |
| Trial number:Treatment:In prox. area | 0.049  | 1 | 0.824        |

### VocPC3

|                                      |        |   |                |
|--------------------------------------|--------|---|----------------|
| Trial number                         | 14.564 | 1 | <0.001         |
| Treatment                            | 2.710  | 1 | 0.100          |
| In prox. area                        | 4.578  | 1 | 0.032          |
| HumanID                              | 0.652  | 1 | 0.419          |
| Batch                                | 44.701 | 1 | < <b>0.001</b> |
| Trial number:Treatment               | 2.485  | 1 | 0.115          |
| Trial number:In prox. area           | 0.315  | 1 | 0.575          |
| Treatment:In prox. area              | 2.502  | 1 | 0.114          |
| Trial number:HumanID                 | 7.978  | 1 | <b>0.005</b>   |
| Trial number:Batch                   | 0.456  | 1 | 0.499          |
| Treatment:Batch                      | 0.029  | 1 | 0.865          |
| Treatment:HumanID                    | 0.000  | 1 | 0.984          |
| In prox. area:HumanID                | 1.696  | 1 | 0.193          |
| In prox. area:Batch                  | 0.001  | 1 | 0.970          |
| Trial number:Treatment:In prox. area | 0.183  | 1 | 0.669          |

Table S2 : Table of contrasts from posthoc tests following significant interaction using the Anova on the model, pairwise comparison with Tukey correction. P-values were generated using the ‘emmeans’ (categorical fixed effect) and ‘lrends’ (continuous fixed effect) functions of the ‘Emmeans’ R package. Estimates indicated are either between groups or slope comparisons, depending on the categorial or continuous variable (trial number). When fixed effect interacting with the batch, the batch number was fixed to compare the fixed effect within each batch. When three way interaction were significant, one factor was fixed to compare the interacting effect of the two other (conditioning time was fixed).

| contrast  | fixed comparison factor if any | estimate | SE    | ratio  | p.value |
|---|--------------------------------|----------|-------|--------|---------|
| <b>Model #1 : behavioural response of the Reunion of Isolation/Reunion test</b> |                                |          |       |        |         |
| <b>ReuPC1</b>   |                                |          |       |        |         |
| Treatment * Conditioning time   |                                |          |       |        |         |
| H after - H+ after  | -                              | 0.022    | 0.311 | 0.072  | 1.000   |
| H after - H before  | -                              | 3.430    | 0.284 | 12.073 | <0.001  |
| H after - H+ before   | -                              | 1.330    | 0.311 | 4.271  | <0.001  |
| H+ after - H before   | -                              | 3.407    | 0.311 | 10.945 | <0.001  |

|                                  |   |        |       |        |        |
|----------------------------------|---|--------|-------|--------|--------|
| H+ after - H+ before             |   | 1.307  | 0.284 | 4.602  |        |
| H before - H+ before             | - | -2.100 | 0.311 | -6.746 | <0.001 |
| <b>Conditioning time   Batch</b> |   |        |       |        |        |
| after - before                   | 1 | 1.446  | 0.287 | 5.039  | <0.001 |
| after - before                   | 2 | 3.291  | 0.287 | 11.466 | <0.001 |
| <b>Treatment * HumanID</b>       |   |        |       |        |        |
| H AH - H+ AH                     |   | -1.634 | 0.340 | -4.808 | <0.001 |
| H AH - H AV                      |   | -0.685 | 0.343 | -1.995 | 0.202  |
| H AH - H+ AV                     |   | -1.129 | 0.340 | -3.321 | 0.009  |
| H+ AH - H AV                     |   | 0.949  | 0.340 | 2.792  | 0.035  |
| H+ AH - H+ AV                    |   | 0.505  | 0.343 | 1.471  | 0.462  |
| H AV - H+ AV                     |   | -0.444 | 0.340 | -1.306 | 0.563  |

### ReuPC2 (sqrt+4)

|                                  |   |        |       |        |        |
|----------------------------------|---|--------|-------|--------|--------|
| <b>Conditioning time   Batch</b> |   |        |       |        |        |
| after - before                   | 1 | 0.137  | 0.103 | 1.330  | 0.189  |
| after - before                   | 2 | -0.416 | 0.103 | -4.052 | <0.001 |

### -ReuPC3 (sqrt +3)

|                                      |   |        |       |        |        |
|--------------------------------------|---|--------|-------|--------|--------|
| <b>Treatment * Conditioning time</b> |   |        |       |        |        |
| H after - H+ after                   | - | -0.252 | 0.078 | -3.237 | 0.009  |
| H after - H before                   | - | 0.187  | 0.072 | 2.613  | 0.054  |
| H after - H+ before                  | - | 0.129  | 0.078 | 1.657  | 0.352  |
| H+ after - H before                  | - | 0.439  | 0.078 | 5.642  | <0.001 |
| H+ after - H+ before                 | - | 0.381  | 0.072 | 5.318  | <0.001 |
| H before - H+ before                 | - | -0.058 | 0.078 | -0.748 | 0.877  |
| <b>Treatment   Batch</b>             |   |        |       |        |        |
| H - H+                               | 1 | -0.314 | 0.084 | -3.721 | <0.001 |
| H - H+                               | 2 | 0.004  | 0.084 | 0.049  | 0.961  |
| <b>Conditioning time   Batch</b>     |   |        |       |        |        |
| after - before                       | 1 | 0.404  | 0.072 | 5.592  | <0.001 |
| after - before                       | 2 | 0.163  | 0.072 | 2.258  | 0.028  |

### Model #2 : Vocal response Isolation/Reunion tests : Treatment \* Phase \* Conditioning time

|                                  |   |       |       |       |        |
|----------------------------------|---|-------|-------|-------|--------|
| <b>Call duration (s) (log)</b>   |   |       |       |       |        |
| <b>Conditioning time   Batch</b> |   |       |       |       |        |
| after - before                   | 1 | 0.171 | 0.045 | 3.760 | <0.001 |
| after - before                   | 2 | 0.398 | 0.052 | 7.680 | <0.001 |

### VocPC2

|                                  |   |        |       |         |        |
|----------------------------------|---|--------|-------|---------|--------|
| <b>Conditioning time   Batch</b> |   |        |       |         |        |
| after - before                   | 1 | -0.832 | 0.101 | -8.232  | <0.001 |
| after - before                   | 2 | -1.755 | 0.120 | -14.595 | <0.001 |

### -VocPC3

|                                  |   |        |       |        |       |
|----------------------------------|---|--------|-------|--------|-------|
| <b>Conditioning time   Batch</b> |   |        |       |        |       |
| after - before                   | 1 | 0.308  | 0.100 | 3.085  | 0.002 |
| after - before                   | 2 | -0.136 | 0.115 | -1.181 | 0.238 |

### Model #3 : Vocal response during the Reunion of Isolation/Reunion tests : conditioning time \* Treatment \* In prox. area

**Call duration (s) (log)**Treatment \* In prox. area |  
conditioning time

|                           |        |        |       |        |        |
|---------------------------|--------|--------|-------|--------|--------|
| H 0 - H+ 0                | after  | 0.040  | 0.071 | 0.564  | 0.943  |
| H 0 - H 1                 | after  | 0.123  | 0.030 | 4.097  | <0.001 |
| H 0 - H+ 1                | after  | 0.090  | 0.073 | 1.224  | 0.612  |
| H+ 0 - H 1                | after  | 0.083  | 0.074 | 1.115  | 0.680  |
| H+ 0 - H+ 1               | after  | 0.050  | 0.025 | 1.989  | 0.192  |
| H 1 - H+ 1                | after  | -0.033 | 0.076 | -0.433 | 0.973  |
| H 0 - H+ 0                | before | 0.187  | 0.079 | 2.384  | 0.080  |
| H 0 - H 1                 | before | 0.312  | 0.049 | 6.329  | <0.001 |
| H 0 - H+ 1                | before | 0.254  | 0.080 | 3.185  | 0.008  |
| H+ 0 - H 1                | before | 0.124  | 0.088 | 1.418  | 0.488  |
| H+ 0 - H+ 1               | before | 0.066  | 0.030 | 2.186  | 0.127  |
| H 1 - H+ 1                | before | -0.058 | 0.087 | -0.664 | 0.911  |
| Conditioning time   Batch |        |        |       |        |        |
| after - before            | 1      | 0.084  | 0.049 | 1.734  | 0.083  |
| after - before            | 2      | 0.492  | 0.059 | 8.334  | <0.001 |

**-VocPC1**Treatment \* In prox. area |  
conditioning time

|                           |        |        |       |        |       |
|---------------------------|--------|--------|-------|--------|-------|
| H 0 - H+ 0                | after  | -0.345 | 0.416 | -0.829 | 0.841 |
| H 0 - H 1                 | after  | -0.227 | 0.184 | -1.232 | 0.607 |
| H 0 - H+ 1                | after  | -0.124 | 0.431 | -0.288 | 0.992 |
| H+ 0 - H 1                | after  | 0.118  | 0.436 | 0.271  | 0.993 |
| H+ 0 - H+ 1               | after  | 0.221  | 0.153 | 1.443  | 0.473 |
| H 1 - H+ 1                | after  | 0.103  | 0.450 | 0.228  | 0.996 |
| H 0 - H+ 0                | before | -0.052 | 0.473 | -0.109 | 1.000 |
| H 0 - H 1                 | before | -1.014 | 0.304 | -3.340 | 0.005 |
| H 0 - H+ 1                | before | 0.311  | 0.480 | 0.647  | 0.917 |
| H+ 0 - H 1                | before | -0.962 | 0.531 | -1.811 | 0.268 |
| H+ 0 - H+ 1               | before | 0.362  | 0.187 | 1.939  | 0.212 |
| H 1 - H+ 1                | before | 1.324  | 0.530 | 2.500  | 0.060 |
| Conditioning time   Batch |        |        |       |        |       |
| after - before            | 1      | 0.552  | 0.395 | 1.397  | 0.162 |
| after - before            | 2      | -0.635 | 0.458 | -1.387 | 0.166 |

**VocPC2\***

\*Note : due to a three way interaction close to significance level, contrasts were generated with the three way interaction and with the two ways interactions of interests

Treatment \* In prox. area |  
conditioning time

|             |        |        |       |        |        |
|-------------|--------|--------|-------|--------|--------|
| H 0 - H+ 0  | after  | 0.112  | 0.215 | 0.519  | 0.955  |
| H 0 - H 1   | after  | -0.216 | 0.093 | -2.326 | 0.092  |
| H 0 - H+ 1  | after  | -0.022 | 0.223 | -0.100 | 1.000  |
| H+ 0 - H 1  | after  | -0.328 | 0.225 | -1.454 | 0.466  |
| H+ 0 - H+ 1 | after  | -0.134 | 0.077 | -1.733 | 0.306  |
| H 1 - H+ 1  | after  | 0.193  | 0.232 | 0.834  | 0.838  |
| H 0 - H+ 0  | before | -0.016 | 0.238 | -0.067 | 1.000  |
| H 0 - H 1   | before | -0.798 | 0.152 | -5.239 | <0.001 |
| H 0 - H+ 1  | before | -0.351 | 0.241 | -1.454 | 0.466  |



|                                   |        |        |       |         |        |
|-----------------------------------|--------|--------|-------|---------|--------|
| H+ 0 - H 1                        | before | -0.783 | 0.267 | -2.933  | 0.018  |
| H+ 0 - H+ 1                       | before | -0.335 | 0.094 | -3.561  | 0.002  |
| H 1 - H+ 1                        | before | 0.448  | 0.266 | 1.685   | 0.332  |
| In prox. area   Conditioning time |        |        |       |         |        |
| 0 - 1                             | after  | -0.175 | 0.061 | -2.876  | 0.004  |
| 0 - 1                             | before | -0.567 | 0.093 | -6.124  | <0.001 |
| Treatment * In prox. area         |        |        |       |         |        |
| H 0 - H+ 0                        |        | 0.048  | 0.198 | 0.242   | 0.995  |
| H 0 - H 1                         |        | -0.507 | 0.092 | -5.539  | <0.001 |
| H 0 - H+ 1                        |        | -0.187 | 0.202 | -0.926  | 0.791  |
| H+ 0 - H 1                        |        | -0.555 | 0.211 | -2.634  | 0.042  |
| H+ 0 - H+ 1                       |        | -0.235 | 0.061 | -3.827  | 0.001  |
| H 1 - H+ 1                        |        | 0.320  | 0.212 | 1.513   | 0.429  |
| In prox. area   Batch             |        |        |       |         |        |
| 0 - 1                             | 1      | -0.223 | 0.064 | -3.480  | 0.001  |
| 0 - 1                             | 2      | -0.519 | 0.086 | -6.051  | <0.001 |
| Conditioning time   Batch         |        |        |       |         |        |
| after - before                    | 1      | -0.680 | 0.140 | -4.864  | <0.001 |
| after - before                    | 2      | -2.009 | 0.172 | -11.710 | <0.001 |

### -VocPC3

|                           |        |        |       |        |       |
|---------------------------|--------|--------|-------|--------|-------|
| Treatment * In prox. area |        |        |       |        |       |
| H 0 - H+ 0                | after  | 0.227  | 0.132 | 1.726  | 0.310 |
| H 0 - H 1                 | after  | 0.125  | 0.073 | 1.703  | 0.322 |
| H 0 - H+ 1                | after  | 0.324  | 0.139 | 2.332  | 0.091 |
| H+ 0 - H 1                | after  | -0.102 | 0.142 | -0.722 | 0.888 |
| H+ 0 - H+ 1               | after  | 0.097  | 0.061 | 1.580  | 0.390 |
| H 1 - H+ 1                | after  | 0.199  | 0.148 | 1.345  | 0.534 |
| H 0 - H+ 0                | before | 0.033  | 0.153 | 0.218  | 0.996 |
| H 0 - H 1                 | before | -0.266 | 0.120 | -2.207 | 0.121 |
| H 0 - H+ 1                | before | 0.105  | 0.156 | 0.674  | 0.907 |
| H+ 0 - H 1                | before | -0.299 | 0.179 | -1.665 | 0.342 |
| H+ 0 - H+ 1               | before | 0.072  | 0.074 | 0.961  | 0.772 |
| H 1 - H+ 1                | before | 0.370  | 0.178 | 2.077  | 0.161 |
| Conditioning time   Batch |        |        |       |        |       |
| after - before            | 1      | 0.334  | 0.103 | 3.237  | 0.001 |
| after - before            | 2      | -0.136 | 0.127 | -1.071 | 0.284 |

### Model #4 : Behavioural response during session of the conditioning

#### Occurrence of missed contact from human

|                      |  |        |         |        |       |
|----------------------|--|--------|---------|--------|-------|
| Treatment            |  |        |         |        |       |
| H - H+               |  | 0.812  | 0.271 - | 3.003  | 0.003 |
| Trial number   Batch |  |        |         |        |       |
| 1 - 2                |  | -0.177 | 0.083 - | -2.118 | 0.034 |

### Model #5 : Vocal response during session of the conditioning Trial number \* Treatment \* In prox. area

#### Call duration (s) (log)

|                              |   |        |       |        |        |
|------------------------------|---|--------|-------|--------|--------|
| Treatment * In prox. area    |   |        |       |        |        |
| H 0 - H+ 0                   | - | 0.121  | 0.053 | 2.293  | 0.100  |
| H 0 - H 1                    | - | 0.357  | 0.035 | 10.168 | <0.001 |
| H 0 - H+ 1                   | - | 0.304  | 0.058 | 5.220  | <0.001 |
| H+ 0 - H 1                   | - | 0.236  | 0.062 | 3.797  | <0.001 |
| H+ 0 - H+ 1                  | - | 0.182  | 0.027 | 6.862  | <0.001 |
| H 1 - H+ 1                   | - | -0.053 | 0.067 | -0.801 | 0.854  |
| Trial number   Batch         |   |        |       |        |        |
| 1 - 2                        | - | -0.028 | 0.012 | -2.318 | 0.020  |
| Treatment   Batch            |   |        |       |        |        |
| H - H+                       | 1 | -0.097 | 0.074 | -1.307 | 0.191  |
| H - H+                       | 2 | 0.165  | 0.077 | 2.155  | 0.031  |
| <b>-VocPC1</b>               |   |        |       |        |        |
| Trial number * In prox. area |   |        |       |        |        |
| 0 - 1                        | - | -0.050 | 0.028 | -1.804 | 0.071  |
| Treatment   Batch            |   |        |       |        |        |
| H - H+                       | 1 | 0.617  | 0.312 | 1.977  | 0.048  |
| H - H+                       | 2 | -0.537 | 0.321 | -1.675 | 0.094  |
| In prox. area   Batch        |   |        |       |        |        |
| 0 - 1                        | 1 | -0.291 | 0.113 | -2.568 | 0.010  |
| 0 - 1                        | 2 | 0.184  | 0.154 | 1.191  | 0.234  |
| <b>VocPC2</b>                |   |        |       |        |        |
| Treatment * In prox. area    |   |        |       |        |        |
| H 0 - H+ 0                   | - | -0.097 | 0.149 | -0.649 | 0.916  |
| H 0 - H 1                    | - | -0.401 | 0.081 | -4.930 | <0.001 |
| H 0 - H+ 1                   | - | -0.216 | 0.159 | -1.356 | 0.527  |
| H+ 0 - H 1                   | - | -0.304 | 0.167 | -1.821 | 0.263  |
| H+ 0 - H+ 1                  | - | -0.119 | 0.062 | -1.936 | 0.213  |
| H 1 - H+ 1                   | - | 0.185  | 0.176 | 1.049  | 0.720  |
| Trial number * In prox. area |   |        |       |        |        |
| 0 - 1                        | - | -0.036 | 0.016 | -2.343 | 0.019  |
| Trial number   Batch         |   |        |       |        |        |
| 1 - 2                        | - | 0.056  | 0.019 | 2.874  | 0.004  |
| In prox. area * HumanID      |   |        |       |        |        |
| 0 AH - 1 AH                  | - | -0.085 | 0.068 | -1.245 | 0.598  |
| 0 AH - 0 AV                  | - | 0.290  | 0.151 | 1.919  | 0.220  |
| 0 AH - 1 AV                  | - | -0.145 | 0.167 | -0.870 | 0.820  |
| 1 AH - 0 AV                  | - | 0.375  | 0.164 | 2.293  | 0.100  |
| 1 AH - 1 AV                  | - | -0.060 | 0.178 | -0.336 | 0.987  |
| 0 AV - 1 AV                  | - | -0.435 | 0.075 | -5.769 | <0.001 |
| <b>VocPC3</b>                |   |        |       |        |        |
| Trial number * HumanID       |   |        |       |        |        |
| AH - AV                      | - | -0.040 | 0.014 | -2.824 | 0.005  |

Table S3 : Table of estimates (standard error SE and 95% confidence intervals) from from models, computed using the ‘emmeans’ (categorical fixed effect) and ‘lstrends’ (continuous fixed effect) functions of the ‘Emmeans’ R package. Estimates indicated are either for groups or slopes, depending on the categorical or continuous variable (trial number). Estimates for all interpretable fixed effect, interacting or not and significant or nor are indicated.

| <b>factor</b> | <b>first<br/>interaction (if<br/>any)</b> | <b>second<br/>interaction (if<br/>any)</b> | <b>estimate</b> | <b>SE</b> | <b>Lower<br/>95%confidence<br/>int.</b> | <b>Upper<br/>95%confidence<br/>int.</b> |
|---------------|---|--|-----------------|-----------|---|---|
|---------------|---|--|-----------------|-----------|---|---|

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**Model #1 : behavioural response during the Reunion of Isolation/Reunion test**

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**ReuPC1**

|                           |        |        |       |        |        |
|---------------------------|--------|--------|-------|--------|--------|
| Treatment *               |        |        |       |        |        |
| Conditioning time         |        |        |       |        |        |
| H                         | after  | 1.195  | 0.220 | 0.759  | 1.632  |
| H+                        | after  | 1.173  | 0.220 | 0.737  | 1.610  |
| H                         | before | -2.234 | 0.220 | -2.671 | -1.798 |
| H+                        | before | -0.134 | 0.220 | -0.571 | 0.302  |
| Conditioning time   Batch |        |        |       |        |        |
| after                     | 1      | 1.515  | 0.222 | 1.074  | 1.956  |
| before                    | 1      | 0.069  | 0.222 | -0.372 | 0.510  |
| after                     | 2      | 0.854  | 0.222 | 0.413  | 1.295  |
| before                    | 2      | -2.437 | 0.222 | -2.878 | -1.996 |
| Treatment *               |        |        |       |        |        |
| HumanID                   |        |        |       |        |        |
| H                         | AH     | -0.862 | 0.240 | -1.344 | -0.380 |
| H+                        | AH     | 0.772  | 0.240 | 0.290  | 1.254  |
| H                         | AV     | -0.177 | 0.240 | -0.659 | 0.305  |
| H+                        | AV     | 0.267  | 0.240 | -0.215 | 0.749  |

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**ReuPC2****(sqrt+4)**

|                           |   |       |       |       |       |
|---------------------------|---|-------|-------|-------|-------|
| Conditioning time   Batch |   |       |       |       |       |
| after                     | 1 | 2.106 | 0.073 | 1.962 | 2.250 |
| before                    | 1 | 1.970 | 0.073 | 1.826 | 2.114 |
| after                     | 2 | 1.664 | 0.073 | 1.520 | 1.808 |
| before                    | 2 | 2.080 | 0.073 | 1.936 | 2.224 |
| Treatment                 |   |       |       |       |       |
| H                         |   | 1.991 | 0.051 | 1.889 | 2.093 |
| H+                        |   | 1.919 | 0.051 | 1.817 | 2.021 |
| HumanID                   |   |       |       |       |       |
| AH                        |   | 1.903 | 0.051 | 1.800 | 2.006 |
| AV                        |   | 2.007 | 0.051 | 1.904 | 2.110 |

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**-ReuPC3****(sqrt +3)**

|                   |        |       |       |       |       |
|-------------------|--------|-------|-------|-------|-------|
| Treatment *       |        |       |       |       |       |
| Conditioning time |        |       |       |       |       |
| H                 | after  | 1.712 | 0.055 | 1.603 | 1.821 |
| H+                | after  | 1.964 | 0.055 | 1.855 | 2.073 |
| H                 | before | 1.525 | 0.055 | 1.416 | 1.634 |
| H+                | before | 1.583 | 0.055 | 1.474 | 1.692 |
| Treatment   Batch |        |       |       |       |       |
| H                 | 1      | 1.539 | 0.060 | 1.419 | 1.658 |
| H+                | 1      | 1.853 | 0.060 | 1.733 | 1.972 |
| H                 | 2      | 1.699 | 0.060 | 1.579 | 1.819 |
| H+                | 2      | 1.695 | 0.060 | 1.575 | 1.814 |

|                           |   |       |       |       |       |
|---------------------------|---|-------|-------|-------|-------|
| Conditioning time   Batch |   |       |       |       |       |
| after                     | 1 | 1.898 | 0.056 | 1.788 | 2.008 |
| before                    | 1 | 1.494 | 0.056 | 1.383 | 1.604 |
| after                     | 2 | 1.779 | 0.056 | 1.668 | 1.889 |
| before                    | 2 | 1.615 | 0.056 | 1.505 | 1.725 |
| HumanID                   |   |       |       |       |       |
| AH                        |   | 1.678 | 0.042 | 1.593 | 1.762 |
| AV                        |   | 1.715 | 0.042 | 1.630 | 1.800 |

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**Model #2 : Vocal response Isolation/Reunion tests : Treatment \* Phase \* Conditioning time**

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**Call duration**

**(s) (log)**

|                           |   |        |       |        |        |
|---------------------------|---|--------|-------|--------|--------|
| Conditioning time   Batch |   |        |       |        |        |
| after                     | 1 | -1.166 | 0.039 | -1.243 | -1.090 |
| before                    | 1 | -1.337 | 0.041 | -1.418 | -1.257 |
| after                     | 2 | -0.928 | 0.041 | -1.008 | -0.848 |
| before                    | 2 | -1.326 | 0.048 | -1.420 | -1.233 |
| Treatment                 |   |        |       |        |        |
| H                         |   | -1.125 | 0.035 | -1.194 | -1.056 |
| H+                        |   | -1.254 | 0.033 | -1.320 | -1.189 |
| Phase                     |   |        |       |        |        |
| isolation                 |   | -1.063 | 0.030 | -1.122 | -1.003 |
| reunion H                 |   | -1.316 | 0.029 | -1.373 | -1.260 |
| HumanID                   |   |        |       |        |        |
| AH                        |   | -1.204 | 0.034 | -1.271 | -1.137 |
| AV                        |   | -1.175 | 0.035 | -1.243 | -1.107 |

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**-VocPC1**

|                   |  |        |       |        |        |
|-------------------|--|--------|-------|--------|--------|
| Treatment         |  |        |       |        |        |
| H                 |  | 0.436  | 0.197 | 0.050  | 0.821  |
| H+                |  | 0.687  | 0.186 | 0.323  | 1.051  |
| Phase             |  |        |       |        |        |
| isolation         |  | 0.341  | 0.161 | 0.025  | 0.656  |
| reunion H         |  | 0.782  | 0.154 | 0.480  | 1.083  |
| HumanID           |  |        |       |        |        |
| AH                |  | 0.763  | 0.190 | 0.391  | 1.136  |
| AV                |  | 0.359  | 0.193 | -0.020 | 0.738  |
| Batch             |  |        |       |        |        |
| 1                 |  | 1.605  | 0.183 | 1.247  | 1.963  |
| 2                 |  | -0.482 | 0.202 | -0.877 | -0.087 |
| Conditioning time |  |        |       |        |        |
| after             |  | 0.594  | 0.167 | 0.268  | 0.921  |
| before            |  | 0.528  | 0.185 | 0.166  | 0.890  |

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**VocPC2**

|                           |   |        |       |        |        |
|---------------------------|---|--------|-------|--------|--------|
| Conditioning time   Batch |   |        |       |        |        |
| after                     | 1 | -0.645 | 0.129 | -0.898 | -0.392 |
| before                    | 1 | 0.187  | 0.133 | -0.073 | 0.448  |

|           |   |  |        |       |        |        |
|-----------|---|--|--------|-------|--------|--------|
| after     | 2 |  | -1.290 | 0.137 | -1.558 | -1.022 |
| before    | 2 |  | 0.465  | 0.150 | 0.172  | 0.759  |
| Treatment |   |  |        |       |        |        |
| H         |   |  | -0.340 | 0.128 | -0.591 | -0.089 |
| H+        |   |  | -0.301 | 0.121 | -0.539 | -0.064 |
| Phase     |   |  |        |       |        |        |
| isolation |   |  | -0.464 | 0.096 | -0.653 | -0.276 |
| reunion H |   |  | -0.177 | 0.094 | -0.361 | 0.007  |
| HumanID   |   |  |        |       |        |        |
| AH        |   |  | -0.097 | 0.125 | -0.342 | 0.147  |
| AV        |   |  | -0.544 | 0.126 | -0.790 | -0.297 |

**-VocPC3**

|              |   |  |        |       |        |        |
|--------------|---|--|--------|-------|--------|--------|
| Conditioning |   |  |        |       |        |        |
| time   Batch |   |  |        |       |        |        |
| after        | 1 |  | -0.415 | 0.086 | -0.583 | -0.248 |
| before       | 1 |  | -0.724 | 0.089 | -0.898 | -0.549 |
| after        | 2 |  | 0.142  | 0.091 | -0.036 | 0.319  |
| before       | 2 |  | 0.277  | 0.104 | 0.074  | 0.481  |
| Treatment    |   |  |        |       |        |        |
| H            |   |  | -0.068 | 0.077 | -0.219 | 0.083  |
| H+           |   |  | -0.292 | 0.073 | -0.434 | -0.149 |
| Phase        |   |  |        |       |        |        |
| isolation    |   |  | -0.107 | 0.060 | -0.225 | 0.010  |
| reunion H    |   |  | -0.253 | 0.058 | -0.366 | -0.140 |
| HumanID      |   |  |        |       |        |        |
| AH           |   |  | -0.136 | 0.074 | -0.282 | 0.010  |
| AV           |   |  | -0.224 | 0.076 | -0.372 | -0.076 |

**Model #3 : Vocal response during the Reunion of Isolation/Reunion tests : conditioning time \* Treatment \*  
In prox. area**

|                      |   |        |        |       |        |        |
|----------------------|---|--------|--------|-------|--------|--------|
| <b>Call duration</b> |   |        |        |       |        |        |
| <b>(s) (log)</b>     |   |        |        |       |        |        |
| Treatment * In       |   |        |        |       |        |        |
| prox. area           |   |        |        |       |        |        |
| H                    | 0 | after  | -1.154 | 0.052 | -1.256 | -1.053 |
| H+                   | 0 | after  | -1.194 | 0.049 | -1.289 | -1.099 |
| H                    | 1 | after  | -1.277 | 0.056 | -1.386 | -1.167 |
| H+                   | 1 | after  | -1.244 | 0.052 | -1.345 | -1.142 |
| H                    | 0 | before | -1.317 | 0.059 | -1.434 | -1.201 |
| H+                   | 0 | before | -1.505 | 0.052 | -1.607 | -1.402 |
| H                    | 1 | before | -1.629 | 0.071 | -1.768 | -1.490 |
| H+                   | 1 | before | -1.571 | 0.054 | -1.677 | -1.465 |
| Conditioning         |   |        |        |       |        |        |
| time   Batch         |   |        |        |       |        |        |
| after                | 1 |        | -1.373 | 0.050 | -1.471 | -1.276 |
| before               | 1 |        | -1.458 | 0.050 | -1.556 | -1.360 |
| after                | 2 |        | -1.061 | 0.051 | -1.162 | -0.961 |
| before               | 2 |        | -1.553 | 0.062 | -1.674 | -1.433 |
| HumanID              |   |        |        |       |        |        |
| AH                   |   |        | -1.412 | 0.045 | -1.501 | -1.324 |

|  |   |        |        |       |        |        |
|--|---|--------|--------|-------|--------|--------|
| AV   |   |        | -1.311 | 0.046 | -1.402 | -1.220 |
| <b>-VocPC1</b>   |   |        |        |       |        |        |
| Treatment * In<br>prox. area  <br>conditioning<br>time |   |        |        |       |        |        |
| H  | 0 | after  | 0.718  | 0.303 | 0.124  | 1.312  |
| H+   | 0 | after  | 1.063  | 0.285 | 0.505  | 1.622  |
| H  | 1 | after  | 0.945  | 0.330 | 0.298  | 1.592  |
| H+   | 1 | after  | 0.842  | 0.306 | 0.242  | 1.442  |
| H  | 0 | before | 0.745  | 0.360 | 0.039  | 1.450  |
| H+   | 0 | before | 0.796  | 0.312 | 0.185  | 1.408  |
| H  | 1 | before | 1.758  | 0.433 | 0.911  | 2.606  |
| H+   | 1 | before | 0.434  | 0.322 | -0.198 | 1.066  |
| Conditioning<br>time   Batch                           |   |        |        |       |        |        |
| after  | 1 |        | 2.072  | 0.293 | 1.498  | 2.646  |
| before   | 1 |        | 1.520  | 0.294 | 0.944  | 2.096  |
| after  | 2 |        | -0.288 | 0.300 | -0.875 | 0.299  |
| before   | 2 |        | 0.347  | 0.375 | -0.389 | 1.082  |
| HumanID  |   |        |        |       |        |        |
| AH   |   |        | 1.145  | 0.228 | 0.699  | 1.592  |
| AV   |   |        | 0.680  | 0.237 | 0.216  | 1.144  |

**VocPC2\***

\*Note : due to a three way interaction close to significance level, contrasts were generating with the three way interaction or with the two ways interactions of interests

|  |        |        |        |       |        |        |
|--|--------|--------|--------|-------|--------|--------|
| Treatment * In<br>prox. area  <br>conditioning<br>time |        |        |        |       |        |        |
| H  | 0      | after  | -0.773 | 0.157 | -1.081 | -0.465 |
| H+   | 0      | after  | -0.884 | 0.147 | -1.173 | -0.596 |
| H  | 1      | after  | -0.557 | 0.170 | -0.891 | -0.223 |
| H+   | 1      | after  | -0.750 | 0.158 | -1.059 | -0.441 |
| H  | 0      | before | 0.312  | 0.180 | -0.040 | 0.664  |
| H+   | 0      | before | 0.328  | 0.159 | 0.016  | 0.640  |
| H  | 1      | before | 1.110  | 0.216 | 0.687  | 1.534  |
| H+   | 1      | before | 0.663  | 0.164 | 0.342  | 0.984  |
| In prox. area  <br>Conditioning<br>time                |        |        |        |       |        |        |
| 0  | after  |        | 0.891  | 0.208 | 0.483  | 1.298  |
| 1  | after  |        | 0.893  | 0.225 | 0.452  | 1.335  |
| 0  | before |        | 0.771  | 0.240 | 0.300  | 1.241  |
| 1  | before |        | 1.096  | 0.274 | 0.558  | 1.634  |
| Treatment * In<br>prox. area                           |        |        |        |       |        |        |
| H  |        | 0      | -0.230 | 0.147 | -0.518 | 0.057  |
| H+   |        | 0      | -0.278 | 0.134 | -0.542 | -0.015 |
| H  |        | 1      | 0.277  | 0.162 | -0.042 | 0.595  |
| H+   |        | 1      | -0.044 | 0.139 | -0.316 | 0.229  |

|               |   |  |        |       |        |        |
|---------------|---|--|--------|-------|--------|--------|
| In prox. area |   |  |        |       |        |        |
| Batch         |   |  |        |       |        |        |
| 0             | 1 |  | -0.136 | 0.135 | -0.400 | 0.128  |
| 1             | 1 |  | 0.087  | 0.141 | -0.189 | 0.363  |
| 0             | 2 |  | -0.372 | 0.149 | -0.664 | -0.081 |
| 1             | 2 |  | 0.146  | 0.162 | -0.171 | 0.463  |
| Conditioning  |   |  |        |       |        |        |
| time   Batch  |   |  |        |       |        |        |
| after         | 1 |  | -0.365 | 0.151 | -0.660 | -0.069 |
| before        | 1 |  | 0.315  | 0.152 | 0.018  | 0.613  |
| after         | 2 |  | -1.117 | 0.156 | -1.424 | -0.811 |
| before        | 2 |  | 0.891  | 0.187 | 0.526  | 1.257  |
| HumanID       |   |  |        |       |        |        |
| AH            |   |  | 0.154  | 0.139 | -0.119 | 0.427  |
| AV            |   |  | -0.292 | 0.143 | -0.571 | -0.012 |

### -VocPC3

|                |   |        |        |       |        |        |
|----------------|---|--------|--------|-------|--------|--------|
| Treatment * In |   |        |        |       |        |        |
| prox. area     |   |        |        |       |        |        |
| H              | 0 | after  | -0.022 | 0.096 | -0.211 | 0.166  |
| H+             | 0 | after  | -0.249 | 0.090 | -0.426 | -0.073 |
| H              | 1 | after  | -0.147 | 0.109 | -0.361 | 0.067  |
| H+             | 1 | after  | -0.347 | 0.100 | -0.543 | -0.150 |
| H              | 0 | before | -0.322 | 0.116 | -0.551 | -0.094 |
| H+             | 0 | before | -0.356 | 0.101 | -0.554 | -0.157 |
| H              | 1 | before | -0.057 | 0.150 | -0.350 | 0.236  |
| H+             | 1 | before | -0.427 | 0.105 | -0.634 | -0.221 |
| Conditioning   |   |        |        |       |        |        |
| time   Batch   |   |        |        |       |        |        |
| after          | 1 |        | -0.483 | 0.092 | -0.664 | -0.303 |
| before         | 1 |        | -0.818 | 0.094 | -1.001 | -0.634 |
| after          | 2 |        | 0.100  | 0.095 | -0.086 | 0.287  |
| before         | 2 |        | 0.236  | 0.122 | -0.002 | 0.475  |
| HumanID        |   |        |        |       |        |        |
| AH             |   |        | -0.190 | 0.081 | -0.349 | -0.032 |
| AV             |   |        | -0.292 | 0.084 | -0.456 | -0.127 |

### Model #4 : Behavioural response during sessions of the conditioning

|                |  |  |        |       |        |        |
|----------------|--|--|--------|-------|--------|--------|
| <b>CondPC1</b> |  |  |        |       |        |        |
| Trial number   |  |  |        |       |        |        |
| -              |  |  | 0.2    | 0.03  | 0.15   | 0.25   |
| Treatment      |  |  |        |       |        |        |
| H              |  |  | -0.080 | 0.240 | -0.562 | 0.402  |
| H+             |  |  | 0.064  | 0.242 | -0.422 | 0.550  |
| HumanID        |  |  |        |       |        |        |
| AH             |  |  | -0.206 | 0.243 | -0.693 | 0.281  |
| AV             |  |  | 0.190  | 0.245 | -0.300 | 0.681  |
| Batch          |  |  |        |       |        |        |
| 1              |  |  | 0.658  | 0.243 | 0.171  | 1.145  |
| 2              |  |  | -0.674 | 0.245 | -1.165 | -0.183 |

### CondPC2



|              |  |        |       |        |        |
|--------------|--|--------|-------|--------|--------|
| Trial number |  |        |       |        |        |
| -            |  | -0.17  | 0.02  | -0.22  | -0.12  |
| Treatment    |  |        |       |        |        |
| H            |  | 0.385  | 0.152 | 0.080  | 0.690  |
| H+           |  | -0.363 | 0.154 | -0.672 | -0.054 |
| HumanID      |  |        |       |        |        |
| AH           |  | 0.061  | 0.153 | -0.246 | 0.368  |
| AV           |  | -0.039 | 0.156 | -0.352 | 0.273  |
| Batch        |  |        |       |        |        |
| 1            |  | -0.312 | 0.153 | -0.619 | -0.004 |
| 2            |  | 0.333  | 0.156 | 0.021  | 0.646  |

**CondPC3**

|              |  |        |       |        |       |
|--------------|--|--------|-------|--------|-------|
| Trial number |  |        |       |        |       |
| -            |  | -0.001 | 0.017 | -0.035 | 0.032 |
| Treatment    |  |        |       |        |       |
| H            |  | -0.176 | 0.103 | -0.383 | 0.031 |
| H+           |  | 0.188  | 0.105 | -0.022 | 0.398 |
| HumanID      |  |        |       |        |       |
| AH           |  | -0.043 | 0.104 | -0.252 | 0.165 |
| AV           |  | 0.055  | 0.106 | -0.157 | 0.267 |
| Batch        |  |        |       |        |       |
| 1            |  | 0.010  | 0.104 | -0.198 | 0.219 |
| 2            |  | 0.002  | 0.106 | -0.210 | 0.214 |

**Occurrence of missed contact from human**

|               |         |        |       |        |        |
|---------------|---------|--------|-------|--------|--------|
| Treatment     |         |        |       |        |        |
| H             | -       | -0.110 | 0.188 | -0.479 | 0.259  |
| H+            | -       | -0.922 | 0.206 | -1.325 | -0.519 |
| Trial   Batch |         |        |       |        |        |
| 1             | 2 to 11 | -0.303 | 0.062 | -0.425 | -0.182 |
| 2             | 2 to 11 | -0.127 | 0.059 | -0.243 | -0.010 |

**Model #5 : Vocal response during session of the conditioning Trial number \* Treatment \* In prox. area**

**Call duration**

**(s) (log)**

Treatment \* In prox. area

|                      |   |        |       |        |        |
|----------------------|---|--------|-------|--------|--------|
| H                    | 0 | -1.263 | 0.038 | -1.338 | -1.189 |
| H+                   | 0 | -1.385 | 0.037 | -1.457 | -1.313 |
| H                    | 1 | -1.621 | 0.050 | -1.719 | -1.522 |
| H+                   | 1 | -1.567 | 0.044 | -1.654 | -1.481 |
| Trial number   Batch |   |        |       |        |        |
| 1                    |   | -0.053 | 0.009 | -0.070 | -0.036 |
| 2                    |   | -0.025 | 0.009 | -0.042 | -0.008 |
| Treatment   Batch    |   |        |       |        |        |
| H                    | 1 | -1.621 | 0.053 | -1.724 | -1.517 |
| H+                   | 1 | -1.523 | 0.055 | -1.631 | -1.416 |
| H                    | 2 | -1.264 | 0.060 | -1.381 | -1.146 |
| H+                   | 2 | -1.429 | 0.052 | -1.532 | -1.326 |

|         |  |        |       |        |        |
|---------|--|--------|-------|--------|--------|
| HumanID |  |        |       |        |        |
| AH      |  | -0.046 | 0.009 | -0.063 | -0.029 |
| AV      |  | -0.032 | 0.009 | -0.050 | -0.015 |

**-VocPC1**

|                |   |        |       |        |        |
|----------------|---|--------|-------|--------|--------|
| Trial number * |   |        |       |        |        |
| In prox. area  |   |        |       |        |        |
| 0              |   | 0.058  | 0.018 | 0.023  | 0.094  |
| 1              |   | 0.109  | 0.031 | 0.048  | 0.169  |
| Treatment      |   |        |       |        |        |
| Batch          |   |        |       |        |        |
| H              | 1 | -0.053 | 0.219 | -0.481 | 0.375  |
| H+             | 1 | -0.670 | 0.227 | -1.115 | -0.225 |
| H              | 2 | -2.570 | 0.248 | -3.056 | -2.084 |
| H+             | 2 | -2.033 | 0.218 | -2.460 | -1.606 |
| In prox. area  |   |        |       |        |        |
| Batch          |   |        |       |        |        |
| 0              | 1 | -0.507 | 0.153 | -0.807 | -0.207 |
| 1              | 1 | -0.216 | 0.183 | -0.575 | 0.144  |
| 0              | 2 | -2.210 | 0.155 | -2.513 | -1.906 |
| 1              | 2 | -2.393 | 0.213 | -2.811 | -1.975 |
| HumanID        |   |        |       |        |        |
| AH             |   | 0.091  | 0.027 | 0.037  | 0.144  |
| AV             |   | 0.076  | 0.028 | 0.021  | 0.132  |

**VocPC2**

|                 |    |        |       |        |        |
|-----------------|----|--------|-------|--------|--------|
| Treatment * In  |    |        |       |        |        |
| prox. area      |    |        |       |        |        |
| H+              | 1  | -1.372 | 0.181 | -1.727 | -1.018 |
| H               | 0  | 0.124  | 0.107 | -0.085 | 0.333  |
| H+              | 0  | 0.220  | 0.104 | 0.016  | 0.425  |
| H               | 1  | 0.525  | 0.130 | 0.269  | 0.780  |
| H+              | 1  | 0.340  | 0.119 | 0.108  | 0.572  |
| Trial number *  |    |        |       |        |        |
| In prox. area   |    |        |       |        |        |
| 0               |    | -0.091 | 0.010 | -0.110 | -0.072 |
| 1               |    | -0.054 | 0.017 | -0.088 | -0.021 |
| Trial number    |    |        |       |        |        |
| Batch           |    |        |       |        |        |
| 1               |    | -0.045 | 0.015 | -0.074 | -0.015 |
| 2               |    | -0.100 | 0.015 | -0.130 | -0.071 |
| In prox. area * |    |        |       |        |        |
| HumanID         |    |        |       |        |        |
| 0               | AH | 0.317  | 0.106 | 0.110  | 0.524  |
| 1               | AH | 0.402  | 0.123 | 0.161  | 0.643  |
| 0               | AV | 0.027  | 0.107 | -0.182 | 0.236  |
| 1               | AV | 0.462  | 0.128 | 0.212  | 0.712  |

**VocPC3**

|                |  |        |       |        |        |
|----------------|--|--------|-------|--------|--------|
| Trial number * |  |        |       |        |        |
| HumanID        |  |        |       |        |        |
| AH             |  | -0.048 | 0.011 | -0.070 | -0.026 |
| AV             |  | -0.007 | 0.012 | -0.031 | 0.016  |
| Treatment      |  |        |       |        |        |

|               |        |       |        |        |
|---------------|--------|-------|--------|--------|
| H             | 0.193  | 0.082 | 0.033  | 0.353  |
| H+            | 0.121  | 0.076 | -0.029 | 0.270  |
| In prox. area |        |       |        |        |
| 0             | 0.205  | 0.052 | 0.103  | 0.308  |
| 1             | 0.108  | 0.069 | -0.026 | 0.243  |
| Batch         |        |       |        |        |
| 1             | -0.181 | 0.077 | -0.333 | -0.030 |
| 2             | 0.495  | 0.083 | 0.332  | 0.659  |

Table S4 : Table of raw values of acoustic parameters in each comparison group of interest.

| Comparison of Isolation Reunion<br>(Isolation/Reunion test : static and silent human) |           |       | Effect of proximity during reunion<br>(Isolation/Reunion test, static and silent human) |                   |           | Effect of proximity sessions of additional positive contacts (conditioning, interacting human) |                          |                      |           |               |                          |                        |       |       |
|---|-----------|-------|---|-------------------|-----------|--|--------------------------|----------------------|-----------|---------------|--------------------------|------------------------|-------|-------|
| Conditioning time   | Treatment | Phase | Ncalls  | Conditioning time | Treatment | In prox. area  | Ncalls                   | Time in conditioning | Treatment | In prox. area | Ncalls                   |                        |       |       |
| <b>Number of calls per group</b>  |           |       |   |                   |           |  |                          |                      |           |               |                          |                        |       |       |
| after   | H         | iso   | 1204  | after             | H         | 0  | 1482                     | early                | H         | 0             | 1240                     |                        |       |       |
|   |           | reuH  | 1976  |                   |           | 1  | 484                      |                      |           | 1             | 164                      |                        |       |       |
|   | H+        | iso   | 1015  |                   | H+        | 0  | 1531                     |                      | H+        | 0             | 1692                     |                        |       |       |
|   |           | reuH  | 2163  |                   |           | 1  | 568                      |                      |           | 1             | 222                      |                        |       |       |
| before  | H         | iso   | 842   | before            | H         | 0  | 432                      | late                 | H         | 0             | 779                      |                        |       |       |
|   |           | reuH  | 662   |                   |           | 1  | 226                      |                      |           | 1             | 77                       |                        |       |       |
|   | H+        | iso   | 630   |                   | H+        | 0  | 609                      |                      | H+        | 0             | 865                      |                        |       |       |
|   |           | reuH  | 1251  |                   |           | 1  | 706                      |                      |           | 1             | 129                      |                        |       |       |
|   |           |       | <b>Mean of parameter</b>  |                   |           |  | <b>Mean of parameter</b> |                      |           |               | <b>Mean of parameter</b> | <b>Sd of parameter</b> |       |       |
|   |           |       | <b>Sd of parameter</b>  |                   |           |  | <b>Sd of parameter</b>   |                      |           |               | <b>Sd of parameter</b>   | <b>Sd of parameter</b> |       |       |
| <b>Mean Dominant Frequency (kHz)</b>  |           |       |   |                   |           |  |                          |                      |           |               |                          |                        |       |       |
| after   | H         | iso   | 0.304   | after             | H         | 0  | 0.320                    | early                | H         | 0             | 0.314                    | 0.039                  |       |       |
|   |           | reuH  | 0.324   |                   |           | 0.071  | 1                        |                      |           | 0.337         | 0.105                    | 1                      | 0.327 | 0.036 |
|   | H+        | iso   | 0.302   |                   | H+        | 0  | 0.314                    |                      | H+        | 0             | 0.322                    | 0.041                  |       |       |
|   |           | reuH  | 0.320   |                   |           | 0.064  | 1                        |                      |           | 0.335         | 0.103                    | 1                      | 0.329 | 0.040 |
| before  | H         | iso   | 0.322   | before            | H         | 0  | 0.334                    | late                 | H         | 0             | 0.303                    | 0.037                  |       |       |
|   |           | reuH  | 0.350   |                   |           | 0.065  | 1                        |                      |           | 0.381         | 0.120                    | 1                      | 0.324 | 0.039 |
|   | H+        | iso   | 0.342   |                   | H+        | 0  | 0.337                    |                      | H+        | 0             | 0.299                    | 0.035                  |       |       |
|   |           | reuH  | 0.343   |                   |           | 0.073  | 1                        |                      |           | 0.348         | 0.060                    | 1                      | 0.331 | 0.057 |
| <b>Min F peak (kHz)</b>   |           |       |   |                   |           |  |                          |                      |           |               |                          |                        |       |       |
| after   | H         | iso   | 0.286   | after             | H         | 0  | 0.296                    | early                | H         | 0             | 0.309                    | 0.052                  |       |       |
|   |           | reuH  | 0.299   |                   |           | 0.049  | 1                        |                      |           | 0.308         | 0.061                    | 1                      | 0.325 | 0.050 |
|   | H+        | iso   | 0.288   |                   | H+        | 0  | 0.288                    |                      | H+        | 0             | 0.322                    | 0.052                  |       |       |
|   |           | reuH  | 0.293   |                   |           | 0.053  | 1                        |                      |           | 0.306         | 0.058                    | 1                      | 0.324 | 0.050 |
| before  | H         | iso   | 0.315   | before            | H         | 0  | 0.327                    | late                 | H         | 0             | 0.296                    | 0.045                  |       |       |
|   |           | reuH  | 0.333   |                   |           | 0.051  | 1                        |                      |           | 0.345         | 0.059                    | 1                      | 0.316 | 0.040 |
|   | H+        | iso   | 0.334   |                   | H+        | 0  | 0.330                    |                      | H+        | 0             | 0.296                    | 0.045                  |       |       |
|   |           | reuH  | 0.336   |                   |           | 0.052  | 1                        |                      |           | 0.342         | 0.043                    | 1                      | 0.318 | 0.047 |

| <b>Mac F peak (kHz)</b> |    |      |       |       |        |    |   |       |       |       |    |   |       |       |
|-------------------------|----|------|-------|-------|--------|----|---|-------|-------|-------|----|---|-------|-------|
| after                   | H  | iso  | 0.931 | 1.071 | after  | H  | 0 | 1.151 | 1.342 | early | H  | 0 | 0.731 | 0.892 |
|                         |    | reuH | 1.177 | 1.383 |        |    | 1 | 1.261 | 1.499 |       |    | 1 | 0.979 | 1.070 |
|                         | H+ | iso  | 0.821 | 1.068 |        | H+ | 0 | 1.045 | 1.284 |       | H+ | 0 | 0.677 | 0.750 |
|                         |    | reuH | 1.058 | 1.282 |        |    | 1 | 1.054 | 1.282 |       |    | 1 | 0.827 | 0.916 |
| before                  | H  | iso  | 0.969 | 1.233 | before | H  | 0 | 0.911 | 1.161 | late  | H  | 0 | 0.804 | 0.975 |
|                         |    | reuH | 1.080 | 1.346 |        |    | 1 | 1.419 | 1.600 |       |    | 1 | 1.013 | 1.121 |
|                         | H+ | iso  | 0.794 | 1.005 |        | H+ | 0 | 0.874 | 1.163 |       | H+ | 0 | 0.788 | 0.886 |
|                         |    | reuH | 0.844 | 1.136 |        |    | 1 | 0.786 | 1.060 |       |    | 1 | 1.040 | 1.070 |

| <b>Mode (Hz)</b> |    |      |         |        |        |    |   |         |         |       |    |   |         |        |
|------------------|----|------|---------|--------|--------|----|---|---------|---------|-------|----|---|---------|--------|
| after            | H  | iso  | 291.278 | 59.014 | after  | H  | 0 | 302.674 | 51.629  | early | H  | 0 | 322.410 | 49.159 |
|                  |    | reuH | 305.321 | 52.397 |        |    | 1 | 313.777 | 54.076  |       |    | 1 | 340.177 | 42.013 |
|                  | H+ | iso  | 292.890 | 45.872 |        | H+ | 0 | 295.295 | 59.358  |       | H+ | 0 | 332.720 | 49.270 |
|                  |    | reuH | 301.645 | 67.420 |        |    | 1 | 317.938 | 84.665  |       |    | 1 | 336.006 | 50.457 |
| before           | H  | iso  | 321.339 | 50.148 | before | H  | 0 | 335.165 | 72.839  | late  | H  | 0 | 303.054 | 45.965 |
|                  |    | reuH | 346.629 | 92.602 |        |    | 1 | 368.842 | 119.373 |       |    | 1 | 322.763 | 40.934 |
|                  | H+ | iso  | 340.806 | 53.094 |        | H+ | 0 | 335.019 | 47.114  |       | H+ | 0 | 303.363 | 45.433 |
|                  |    | reuH | 342.822 | 49.077 |        |    | 1 | 350.652 | 47.117  |       |    | 1 | 326.297 | 45.992 |

| <b>Mean (Hz)</b> |    |      |          |         |        |    |   |         |   |       |    |         |          |         |
|------------------|----|------|----------|---------|--------|----|---|---------|---|-------|----|---------|----------|---------|
| after            | H  | iso  | 1817.653 | 385.617 | after  | H  | 0 | 1885.08 |   | early | H  | 0       | 1494.859 | 294.318 |
|                  |    | reuH | 1879.520 | 423.215 |        |    | 1 | 1868.69 | 3 |       |    | 426.846 | 410.882  | 1       |
|                  | H+ | iso  | 1842.219 | 428.577 |        | H+ | 0 | 1887.65 |   |       | H+ | 0       | 1443.195 | 263.108 |
|                  |    | reuH | 1878.859 | 453.032 |        |    | 1 | 1837.23 | 6 |       |    | 457.439 | 442.185  | 1       |
| before           | H  | iso  | 1769.750 | 442.237 | before | H  | 0 | 1811.10 |   | late  | H  | 0       | 1524.356 | 294.879 |
|                  |    | reuH | 1822.634 | 433.496 |        |    | 1 | 1851.11 | 2 |       |    | 443.617 | 414.251  | 1       |
|                  | H+ | iso  | 1687.113 | 390.208 |        | H+ | 0 | 1812.03 |   |       | H+ | 0       | 1507.883 | 269.191 |
|                  |    | reuH | 1786.125 | 457.160 |        |    | 1 | 1736.17 | 7 |       |    | 445.991 | 462.373  | 1       |

| <b>Q50 (Hz)</b> |    |      |         |         |        |    |   |         |         |       |    |   |         |         |
|-----------------|----|------|---------|---------|--------|----|---|---------|---------|-------|----|---|---------|---------|
| after           | H  | iso  | 750.232 | 484.174 | after  | H  | 0 | 847.308 | 569.306 | early | H  | 0 | 493.711 | 212.211 |
|                 |    | reuH | 842.007 | 554.088 |        |    | 1 | 831.133 | 505.754 |       |    | 1 | 567.891 | 232.048 |
|                 | H+ | iso  | 778.814 | 545.853 |        | H+ | 0 | 865.811 | 614.602 |       | H+ | 0 | 473.187 | 152.404 |
|                 |    | reuH | 858.754 | 600.966 |        |    | 1 | 813.264 | 558.239 |       |    | 1 | 494.802 | 159.335 |
| before          | H  | iso  | 751.721 | 524.095 | before | H  | 0 | 766.585 | 539.701 | late  | H  | 0 | 500.546 | 223.284 |
|                 |    | reuH | 803.559 | 544.105 |        |    | 1 | 881.844 | 547.431 |       |    | 1 | 581.590 | 319.693 |
|                 | H+ | iso  | 665.355 | 454.203 |        | H+ | 0 | 755.510 | 511.427 |       | H+ | 0 | 496.292 | 213.039 |
|                 |    | reuH | 742.369 | 506.089 |        |    | 1 | 709.311 | 487.096 |       |    | 1 | 555.141 | 238.753 |

| <b>Q25 (Hz)</b> |    |      |         |         |        |    |   |         |         |       |    |   |         |        |
|-----------------|----|------|---------|---------|--------|----|---|---------|---------|-------|----|---|---------|--------|
| after           | H  | iso  | 302.742 | 69.646  | after  | H  | 0 | 330.530 | 103.016 | early | H  | 0 | 287.444 | 46.594 |
|                 |    | reuH | 330.573 | 101.286 |        |    | 1 | 331.723 | 96.435  |       |    | 1 | 309.890 | 50.641 |
|                 | H+ | iso  | 304.540 | 75.870  |        | H+ | 0 | 324.614 | 99.783  |       | H+ | 0 | 290.177 | 45.347 |
|                 |    | reuH | 328.360 | 100.583 |        |    | 1 | 333.044 | 95.537  |       |    | 1 | 301.554 | 51.488 |
| before          | H  | iso  | 317.037 | 82.577  | before | H  | 0 | 328.490 | 95.369  | late  | H  | 0 | 283.892 | 41.855 |
|                 |    | reuH | 345.858 | 104.483 |        |    | 1 | 380.512 | 112.884 |       |    | 1 | 320.480 | 64.909 |
|                 | H+ | iso  | 324.410 | 81.132  |        | H+ | 0 | 333.849 | 77.673  |       | H+ | 0 | 281.491 | 39.744 |

|  |      |         |        |  |   |         |        |  |   |         |        |
|--|------|---------|--------|--|---|---------|--------|--|---|---------|--------|
|  | reuH | 335.275 | 74.787 |  | 1 | 333.792 | 70.761 |  | 1 | 307.556 | 57.016 |
|--|------|---------|--------|--|---|---------|--------|--|---|---------|--------|

**Q75 (Hz)**

|        |    |      |          |          |        |    |   |              |          |       |    |   |          |         |
|--------|----|------|----------|----------|--------|----|---|--------------|----------|-------|----|---|----------|---------|
| after  | H  | iso  | 2724.508 | 901.531  | after  | H  | 0 | 2855.25<br>1 | 962.026  | early | H  | 0 | 1907.359 | 821.008 |
|        |    | reuH | 2838.172 | 964.096  |        |    | 1 | 2800.45<br>4 | 966.843  |       |    | 1 | 2271.884 | 873.368 |
|        | H+ | iso  | 2797.501 | 989.550  |        | H+ | 0 | 2871.37<br>8 | 1036.874 |       | H+ | 0 | 1795.251 | 756.385 |
|        |    | reuH | 2841.678 | 1032.082 |        |    | 1 | 2731.68<br>2 | 1032.696 |       |    | 1 | 1886.704 | 797.162 |
| before | H  | iso  | 2667.213 | 1043.411 | before | H  | 0 | 2718.41<br>7 | 1054.461 | late  | H  | 0 | 2005.637 | 806.336 |
|        |    | reuH | 2716.523 | 1026.942 |        |    | 1 | 2724.73<br>0 | 979.535  |       |    | 1 | 2132.724 | 873.945 |
|        | H+ | iso  | 2483.126 | 934.606  |        | H+ | 0 | 2770.86<br>2 | 1082.494 |       | H+ | 0 | 2019.569 | 718.732 |
|        |    | reuH | 2669.632 | 1139.513 |        |    | 1 | 2509.77<br>8 | 1182.463 |       |    | 1 | 2167.271 | 749.616 |

**Centroid (Hz)**

|        |    |      |          |         |        |    |   |              |         |       |    |   |          |         |
|--------|----|------|----------|---------|--------|----|---|--------------|---------|-------|----|---|----------|---------|
| after  | H  | iso  | 1817.653 | 385.617 | after  | H  | 0 | 1885.08<br>7 | 426.846 | early | H  | 0 | 1494.859 | 294.318 |
|        |    | reuH | 1879.520 | 423.215 |        |    | 1 | 1868.69<br>3 | 410.882 |       |    | 1 | 1628.225 | 304.585 |
|        | H+ | iso  | 1842.219 | 428.577 |        | H+ | 0 | 1887.65<br>6 | 457.439 |       | H+ | 0 | 1443.195 | 263.108 |
|        |    | reuH | 1878.859 | 453.032 |        |    | 1 | 1837.23<br>2 | 442.185 |       |    | 1 | 1472.662 | 285.439 |
| before | H  | iso  | 1769.750 | 442.237 | before | H  | 0 | 1811.10<br>2 | 443.617 | late  | H  | 0 | 1524.356 | 294.879 |
|        |    | reuH | 1822.634 | 433.496 |        |    | 1 | 1851.11<br>7 | 414.251 |       |    | 1 | 1581.281 | 341.346 |
|        | H+ | iso  | 1687.113 | 390.208 |        | H+ | 0 | 1812.03<br>1 | 445.991 |       | H+ | 0 | 1507.883 | 269.191 |
|        |    | reuH | 1786.125 | 457.160 |        |    | 1 | 1736.17<br>6 | 462.373 |       |    | 1 | 1563.601 | 289.547 |

**Sd (Hz)**

|        |    |      |          |         |        |    |   |              |         |       |    |   |          |         |
|--------|----|------|----------|---------|--------|----|---|--------------|---------|-------|----|---|----------|---------|
| after  | H  | iso  | 2134.495 | 176.184 | after  | H  | 0 | 2145.79<br>5 | 174.256 | early | H  | 0 | 1990.877 | 174.232 |
|        |    | reuH | 2144.085 | 175.255 |        |    | 1 | 2141.37<br>2 | 177.553 |       |    | 1 | 2047.922 | 175.263 |
|        | H+ | iso  | 2153.259 | 199.831 |        | H+ | 0 | 2147.76<br>1 | 186.968 |       | H+ | 0 | 1942.072 | 169.828 |
|        |    | reuH | 2140.791 | 187.566 |        |    | 1 | 2120.01<br>9 | 192.350 |       |    | 1 | 1940.150 | 184.449 |
| before | H  | iso  | 2069.712 | 201.094 | before | H  | 0 | 2111.66<br>0 | 193.862 | late  | H  | 0 | 2007.860 | 175.699 |
|        |    | reuH | 2096.807 | 194.727 |        |    | 1 | 2070.05<br>4 | 195.140 |       |    | 1 | 1992.677 | 170.148 |
|        | H+ | iso  | 2022.945 | 173.442 |        | H+ | 0 | 2106.11<br>4 | 205.720 |       | H+ | 0 | 1974.469 | 164.606 |
|        |    | reuH | 2095.007 | 211.699 |        |    | 1 | 2071.60<br>1 | 217.408 |       |    | 1 | 1964.886 | 163.211 |

**IQR (Hz)**

|       |    |      |          |         |       |    |   |              |         |       |    |   |          |         |
|-------|----|------|----------|---------|-------|----|---|--------------|---------|-------|----|---|----------|---------|
| after | H  | iso  | 2421.766 | 863.329 | after | H  | 0 | 2524.72<br>0 | 902.648 | early | H  | 0 | 1619.915 | 797.974 |
|       |    | reuH | 2507.599 | 906.090 |       |    | 1 | 2468.73<br>1 | 912.873 |       |    | 1 | 1961.994 | 849.624 |
|       | H+ | iso  | 2492.962 | 947.609 |       | H+ | 0 | 2546.76<br>3 | 981.693 |       | H+ | 0 | 1505.074 | 739.851 |

|        |    |      |          |          |        |    |   |         |      |    |   |          |         |
|--------|----|------|----------|----------|--------|----|---|---------|------|----|---|----------|---------|
|        |    | reuH | 2513.318 | 978.741  |        |    | 1 | 2398.63 |      |    |   |          |         |
| before | H  | iso  | 2350.176 | 993.024  | before | H  | 0 | 2389.92 | late | H  | 0 | 1721.745 | 785.012 |
|        |    | reuH | 2370.665 | 976.677  |        |    | 1 | 2344.21 |      |    | 1 | 1812.245 | 828.439 |
|        | H+ | iso  | 2158.716 | 893.869  |        | H+ | 0 | 2437.01 |      | H+ | 0 | 1738.078 | 702.471 |
|        |    | reuH | 2334.358 | 1094.079 |        |    | 1 | 2175.98 |      |    | 1 | 1859.715 | 720.425 |

### Sfm

|        |    |      |       |       |        |    |   |       |       |       |    |   |       |       |
|--------|----|------|-------|-------|--------|----|---|-------|-------|-------|----|---|-------|-------|
| after  | H  | iso  | 0.545 | 0.112 | after  | H  | 0 | 0.565 | 0.121 | early | H  | 0 | 0.447 | 0.091 |
|        |    | reuH | 0.563 | 0.120 |        |    | 1 | 0.560 | 0.117 |       |    | 1 | 0.485 | 0.095 |
|        | H+ | iso  | 0.551 | 0.121 |        | H+ | 0 | 0.564 | 0.129 |       | H+ | 0 | 0.432 | 0.083 |
|        |    | reuH | 0.562 | 0.129 |        |    | 1 | 0.549 | 0.127 |       |    | 1 | 0.437 | 0.089 |
| before | H  | iso  | 0.531 | 0.129 | before | H  | 0 | 0.541 | 0.131 | late  | H  | 0 | 0.454 | 0.088 |
|        |    | reuH | 0.544 | 0.128 |        |    | 1 | 0.552 | 0.123 |       |    | 1 | 0.468 | 0.104 |
|        | H+ | iso  | 0.506 | 0.115 |        | H+ | 0 | 0.538 | 0.130 |       | H+ | 0 | 0.454 | 0.085 |
|        |    | reuH | 0.530 | 0.134 |        |    | 1 | 0.515 | 0.136 |       |    | 1 | 0.467 | 0.090 |

### Sh

|        |    |      |       |       |        |    |   |       |       |       |    |   |       |       |
|--------|----|------|-------|-------|--------|----|---|-------|-------|-------|----|---|-------|-------|
| after  | H  | iso  | 0.810 | 0.064 | after  | H  | 0 | 0.820 | 0.068 | early | H  | 0 | 0.757 | 0.058 |
|        |    | reuH | 0.820 | 0.067 |        |    | 1 | 0.821 | 0.065 |       |    | 1 | 0.781 | 0.056 |
|        | H+ | iso  | 0.810 | 0.068 |        | H+ | 0 | 0.817 | 0.072 |       | H+ | 0 | 0.751 | 0.052 |
|        |    | reuH | 0.816 | 0.072 |        |    | 1 | 0.811 | 0.070 |       |    | 1 | 0.756 | 0.054 |
| before | H  | iso  | 0.802 | 0.071 | before | H  | 0 | 0.804 | 0.073 | late  | H  | 0 | 0.761 | 0.056 |
|        |    | reuH | 0.810 | 0.071 |        |    | 1 | 0.824 | 0.064 |       |    | 1 | 0.775 | 0.062 |
|        | H+ | iso  | 0.788 | 0.064 |        | H+ | 0 | 0.803 | 0.071 |       | H+ | 0 | 0.762 | 0.055 |
|        |    | reuH | 0.797 | 0.074 |        |    | 1 | 0.789 | 0.075 |       |    | 1 | 0.775 | 0.056 |

### Entropy H

|        |    |      |       |       |        |    |   |       |       |       |    |   |       |       |
|--------|----|------|-------|-------|--------|----|---|-------|-------|-------|----|---|-------|-------|
| after  | H  | iso  | 0.626 | 0.049 | after  | H  | 0 | 0.625 | 0.049 | early | H  | 0 | 0.595 | 0.044 |
|        |    | reuH | 0.624 | 0.049 |        |    | 1 | 0.624 | 0.049 |       |    | 1 | 0.607 | 0.044 |
|        | H+ | iso  | 0.624 | 0.051 |        | H+ | 0 | 0.622 | 0.054 |       | H+ | 0 | 0.589 | 0.040 |
|        |    | reuH | 0.621 | 0.054 |        |    | 1 | 0.614 | 0.053 |       |    | 1 | 0.592 | 0.042 |
| before | H  | iso  | 0.613 | 0.050 | before | H  | 0 | 0.613 | 0.053 | late  | H  | 0 | 0.595 | 0.042 |
|        |    | reuH | 0.614 | 0.051 |        |    | 1 | 0.618 | 0.047 |       |    | 1 | 0.604 | 0.046 |
|        | H+ | iso  | 0.602 | 0.047 |        | H+ | 0 | 0.603 | 0.053 |       | H+ | 0 | 0.595 | 0.042 |
|        |    | reuH | 0.597 | 0.056 |        |    | 1 | 0.589 | 0.057 |       |    | 1 | 0.602 | 0.044 |

### Skewness

|        |    |      |       |       |        |    |   |       |       |       |    |   |       |       |
|--------|----|------|-------|-------|--------|----|---|-------|-------|-------|----|---|-------|-------|
| after  | H  | iso  | 4.525 | 0.678 | after  | H  | 0 | 4.485 | 0.663 | early | H  | 0 | 4.439 | 0.560 |
|        |    | reuH | 4.442 | 0.690 |        |    | 1 | 4.302 | 0.754 |       |    | 1 | 4.405 | 0.562 |
|        | H+ | iso  | 4.637 | 0.598 |        | H+ | 0 | 4.592 | 0.669 |       | H+ | 0 | 4.467 | 0.535 |
|        |    | reuH | 4.557 | 0.689 |        |    | 1 | 4.516 | 0.721 |       |    | 1 | 4.417 | 0.578 |
| before | H  | iso  | 4.408 | 0.556 | before | H  | 0 | 4.473 | 0.578 | late  | H  | 0 | 4.587 | 0.501 |
|        |    | reuH | 4.320 | 0.743 |        |    | 1 | 4.017 | 0.915 |       |    | 1 | 4.443 | 0.638 |
|        | H+ | iso  | 4.527 | 0.528 |        | H+ | 0 | 4.510 | 0.533 |       | H+ | 0 | 4.630 | 0.504 |
|        |    | reuH | 4.549 | 0.545 |        |    | 1 | 4.579 | 0.543 |       |    | 1 | 4.488 | 0.594 |

### Kurtosis

|       |    |      |        |       |       |    |   |        |       |       |    |   |        |       |
|-------|----|------|--------|-------|-------|----|---|--------|-------|-------|----|---|--------|-------|
| after | H  | iso  | 24.851 | 6.106 | after | H  | 0 | 24.571 | 5.721 | early | H  | 0 | 23.585 | 5.285 |
|       |    | reuH | 24.187 | 5.944 |       |    | 1 | 22.948 | 6.454 |       |    | 1 | 23.511 | 5.443 |
|       | H+ | iso  | 25.901 | 5.610 |       | H+ | 0 | 25.663 | 5.917 |       | H+ | 0 | 23.892 | 5.198 |
|       |    | reuH | 25.329 | 6.093 |       |    | 1 | 24.865 | 6.429 |       |    | 1 | 23.557 | 5.393 |

|                          |    |      |        |       |        |    |   |        |       |       |    |   |        |       |
|--------------------------|----|------|--------|-------|--------|----|---|--------|-------|-------|----|---|--------|-------|
| before                   | H  | iso  | 23.361 | 5.093 | before | H  | 0 | 24.071 | 5.215 | late  | H  | 0 | 25.056 | 4.700 |
|                          |    | reuH | 22.971 | 6.224 |        |    | 1 | 20.784 | 7.356 |       |    | 1 | 24.180 | 5.847 |
|                          | H+ | iso  | 24.464 | 5.004 |        | H+ | 0 | 24.275 | 4.880 |       | H+ | 0 | 25.495 | 4.883 |
|                          |    | reuH | 24.699 | 5.008 |        |    | 1 | 25.036 | 5.006 |       |    | 1 | 24.380 | 5.485 |
| <b>Call duration (s)</b> |    |      |        |       |        |    |   |        |       |       |    |   |        |       |
| after                    | H  | iso  | 0.497  | 0.252 | after  | H  | 0 | 0.366  | 0.193 | early | H  | 0 | 0.358  | 0.178 |
|                          |    | reuH | 0.366  | 0.205 |        |    | 1 | 0.364  | 0.236 |       |    | 1 | 0.243  | 0.166 |
|                          | H+ | iso  | 0.435  | 0.164 |        | H+ | 0 | 0.349  | 0.163 |       | H+ | 0 | 0.330  | 0.174 |
|                          |    | reuH | 0.339  | 0.161 |        |    | 1 | 0.316  | 0.156 |       |    | 1 | 0.265  | 0.151 |
| before                   | H  | iso  | 0.387  | 0.195 | before | H  | 0 | 0.326  | 0.177 | late  | H  | 0 | 0.301  | 0.185 |
|                          |    | reuH | 0.308  | 0.180 |        |    | 1 | 0.272  | 0.181 |       |    | 1 | 0.236  | 0.177 |
|                          | H+ | iso  | 0.329  | 0.134 |        | H+ | 0 | 0.262  | 0.122 |       | H+ | 0 | 0.255  | 0.134 |
|                          |    | reuH | 0.248  | 0.123 |        |    | 1 | 0.231  | 0.120 |       |    | 1 | 0.203  | 0.111 |

Table S5: Number of calls of each call type recorded during the session and the number of pigs involved in the count. Taking into account the different statistical variable that needed to be add in the models, and thus the number of calls and pigs needed to have reliable statistical analysis, it was thus decided to use only grunts in this study.

| Call type | Treatment | Before conditioning<br>(Isolation/Reunion test –<br>Reunion with H) |        | During conditioning<br>(all trials pooled) |        | After conditioning<br>(Isolation/Reunion test –<br>Reunion with H) |        |    |
|-----------|-----------|---|--------|--|--------|--|--------|----|
|           |           | N calls   | N pigs | N calls                                    | N pigs | N calls  | N pigs |    |
| bark      | H         |   | 14     | 5  | 13     | 7  | 6      | 3  |
| grunt     | H         |   | 670    | 21   | 3979   | 29   | 1981   | 25 |
| mixed     | H         |   | 8      | 1  | 172    | 12   | 157    | 9  |
| scream    | H         |   | 0      | 0  | 14     | 4  | 39     | 2  |
| squeal    | H         |   | 11     | 2  | 94     | 10   | 66     | 11 |
| bark      | H+        |   | 4      | 2  | 18     | 6  | 1      | 1  |
| grunt     | H+        |   | 1244   | 27   | 5006   | 29   | 2072   | 27 |
| mixed     | H+        |   | 0      | 0  | 142    | 12   | 21     | 3  |
| scream    | H+        |   | 0      | 0  | 7      | 2  | 0      | 0  |
| squeal    | H+        |   | 8      | 2  | 50     | 8  | 25     | 6  |