

## 1 ***Supplementary Material***

### 2 ***Pre-scan training session questionnaire***

#### 3 ***Methods***

4 After each of the four experimental condition of the pre-scan training session we  
5 asked the participants to rate the strangeness of the sensation (Q1), the feeling of  
6 widening of the finger (Q2), the feeling of numbness (Q3), the feeling that the two  
7 index fingers merged into one big finger (Q4), and the feeling of owning the other  
8 person's finger (Q5). Rating was performed on a scale from 1 (no effect) to 5 (strong  
9 effect).

10 For each participant independently, we first computed the individual mean and  
11 standard deviation of the responses across all the experimental conditions and  
12 questions. Then, data were ipsatized to neutralize the effect in responses set and to  
13 transform the questionnaire scores in Z-distributed values, allowing the use of  
14 parametric statistical tests (Cattell, 1944; Broughton and Wasel, 1990). Ipsatization  
15 was computed by subtracting the mean value and dividing the demeaned scores by  
16 the standard deviation. One subject was excluded from this analysis because he  
17 equally rated all conditions and questions, and such lack of variance made  
18 impossible to ipsatize the values.

19 For each question, the ipsatized ratings were analyzed by means of a 2-way  
20 repeated measures analysis of variance (ANOVA) with Agent (self, other) and  
21 Synchrony (synchronous and asynchronous) as within-subject factors. Post-hoc

1 analyses were conducted using the Tukey Honestly Significant Difference (HSD) test  
2 thresholded at  $p < 0.05$ .

### 3 **Results**

4 The average ratings for the five questions in the four experimental conditions are  
5 displayed in Supplementary Fig. 4.

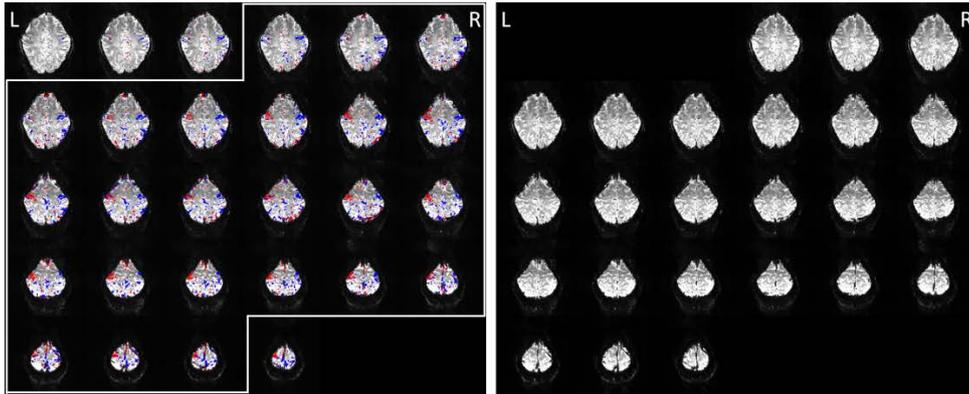
6 The ANOVA on Q1 (strangeness of the sensation) showed a main effect of the  
7 Agent ( $F_{1,10}=17.7$ ,  $p < 0.002$ ), with the self stroking leading to a stranger sensation.  
8 The analysis of Q2 (feeling of widening of the finger) showed a main effect of the  
9 agent ( $F_{1,10}=7.6$ ,  $p < 0.020$ ), with the self stroking leading to a feeling of a having a  
10 wider finger, and of synchrony ( $F_{1,10}=21.8$ ,  $p < 0.001$ ) with the synchronous stroking  
11 leading to a feeling of a having a wider finger. More importantly, the  
12 Agent $\times$ Synchrony interaction was also significant ( $F_{1,10}=10.6$ ,  $p < 0.009$ ). Post-hoc  
13 analysis showed that the self-synchronous stroking induced higher rating compared  
14 to all the other conditions (all  $p < 0.001$ ), and no difference was observed between the  
15 ratings of the other three experimental conditions (all  $p > 0.09$ ). The analysis of Q3  
16 (feeling of numbness) showed only a main effect of synchrony ( $F_{1,10}=6.6$ ,  $p < 0.028$ )  
17 with the synchronous stroking leading to a stronger numbness sensation. The  
18 analysis of Q4 (feeling that the two index fingers merged into one big finger) did not  
19 show any significant effect. Finally, the analysis of Q5 (feeling of owning the other  
20 person's finger) showed a significant Agent $\times$ Synchrony interaction ( $F_{1,10}=11.2$ ,  
21  $p < 0.008$ ), with a significantly different rating between the self- and other-synchronous  
22 condition ( $p < 0.03$ ) but not between the self- and other-asynchronous condition  
23 ( $p = 0.064$ ).

1 **References**

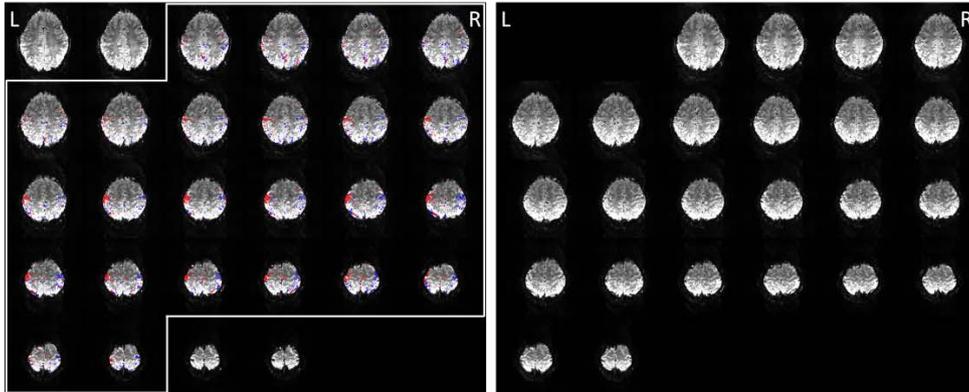
- 2 Broughton, R. & Wasel, N. (1990) 'A Text-Stimuli Presentation Manager for the Ibm  
3 Pc with Ipsatization Correction for Response Sets and Reaction-Times', *Behavior*  
4 *Research Methods Instruments & Computers*, **22**(4), pp. 421-423.  
5 Cattell, R. B. (1944) 'Psychological measurement: normative, ipsative, interactive',  
6 *Psychological Review*, **51**(5), pp. 292-303.

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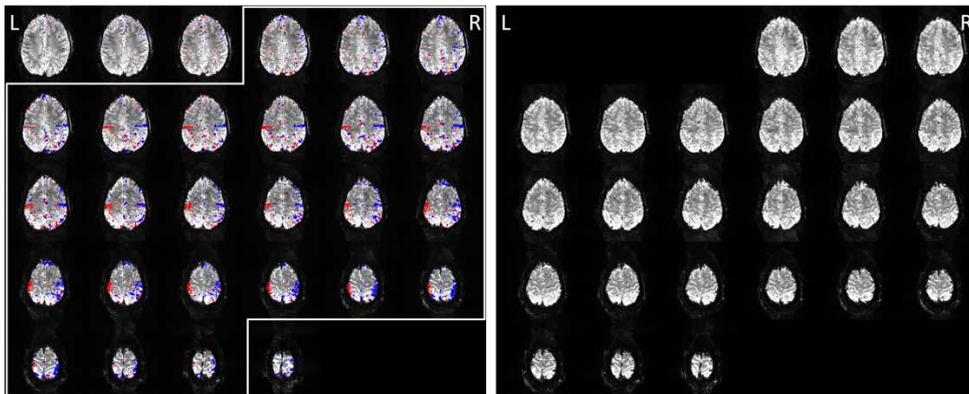
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S05



S12

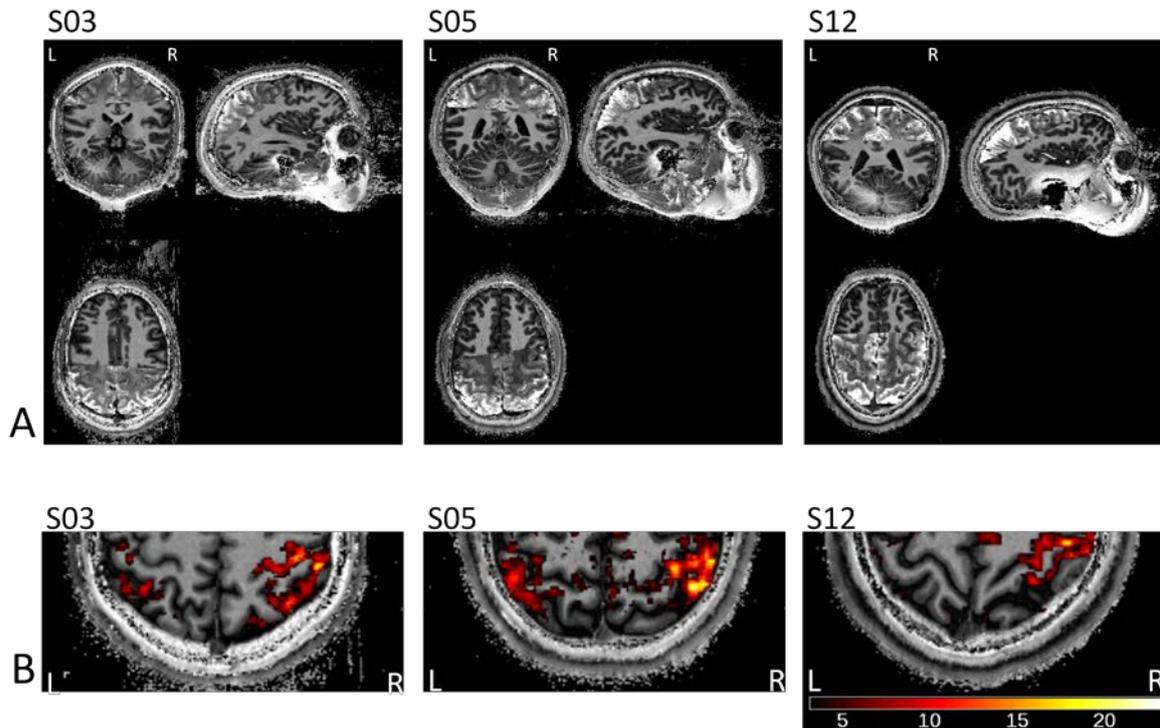


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2 **Supplementary Figure 1:** Slice selection for the finger mapping (left panels) and for the  
3 illusion (right panels) runs in three representative subjects. The thresholded F-contrast  
4 ( $p < 0.001$ ) for the right (in red) and left (in blue) finger mapping have been overlaid on the  
5 slices of the finger mapping runs. The white box in the left panels highlights the slices  
6 selected for the illusion runs.

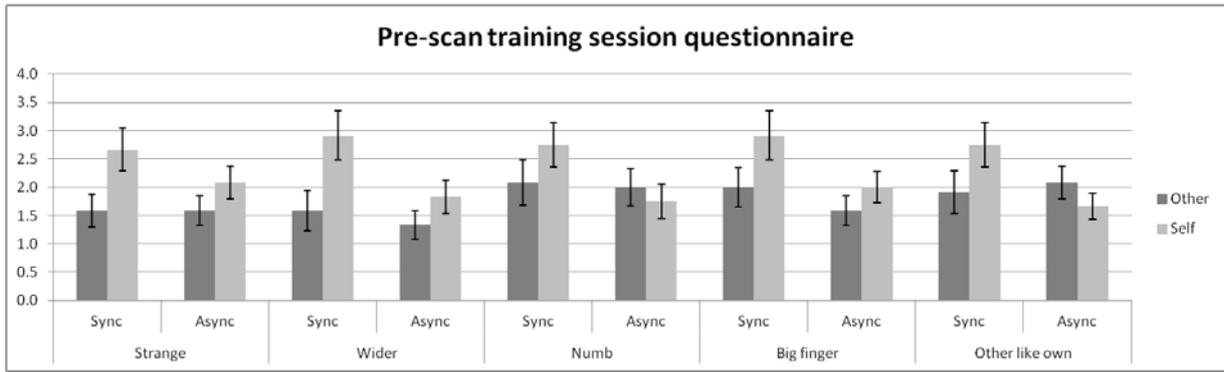
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2 **Supplementary Figure 2:** Masks of BA 3b, 1, and 2 for three representative subjects  
3 overlaid to their relative MP2RAGE image.



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2 **Supplementary Figure 3:** A: EPI and anatomical correspondence in three representative  
 3 subjects. B: Results of the single subject analysis (Self-Synchronous condition thresholded at  
 4  $p < 0.001$  uncorrected) for three representative subjects; color bar indicates the t- values. In all  
 5 panels images are not normalized and shown in neurological convention.



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2 **Supplementary Figure 4:** Results of the pre-scan training session questionnaire. The  
 3 ANOVA revealed an AgentxSynchrony interaction only for the feeling of widening of the  
 4 finger and for the feeling of owning the other person's finger.