SI Text

Analysis of the effect of facing vs. nonfacing relation as a function of ROI (EBA, FFA, PPA, EVC) and hemisphere (left vs. right)

Functional ROIs were defined by using two unilateral masks (left and right) of the inferior LOC, TOFC and inferior PHC, then within each mask of each participants, by selecting up to 200 voxels with activity above a voxelwise threshold of $p > 0.05$ for the contrasts of interests (EBA : bodies > object in inferior LOC; FFA : faces > objects in TOFC; PPA : places > objects in inferior PHC). Left and right EVC was defined by creating two unilateral mask, using a probabilistic map of visual topography (23) and selecting up to 200 voxel with the highest probability ranking for each hemisphere.

As shown in Fig. S1b, for each ROI, the effect of relation was similar in the left and right hemisphere. The ANOVA on mean beta values with relation (facing vs. nonfacing dyads), ROI (EBA vs. FFA vs. PPA vs. EVC) and hemisphere (left vs. right) as repeated-measures factors revealed a significant main effect of ROI, $F(3,57) = 91.78$, $p < 0.001$, $\eta_p^2 = 0.83$, but no effect of relation, $F(1,19) = 3.98$, $p = 0.061$, $\eta_p^2 = 0.17$, or hemisphere, $F(1,19) = 3.61$, $p = 0.073$, $\eta_p^2 = 0.16$. Moreover, there was a significant interaction between relation and ROI, $F(3,57) = 8.39$, $p < 0.001$, $\eta_p^2 = 0.31$, reflecting stronger response to facing dyads than to nonfacing dyads in both the left and right EBA (left: $t(19) = 3.13$, $p = 0.006$; right: $t(19) = 3.24$, $p = 0.004$), and the left and right FFA (left: $t(19) = 3.08$, $p = 0.006$; right: $t(19) = 3.26$, $p = 0.004$), but no difference between facing and nonfacing dyads in the left and right PPA (left: $t(19) < 1$, *n.s*; right: $t(19) = 1.31$, $p = 0.207$), or in the left and right EVC (left: $t(19) < 1$, *n.s*; right: $t(19) < 1$, *n.s*) (two-tailed *t* tests). There was no significant interaction between relation and hemisphere, $F(1,19) = 0.41$, $p > 0.250$, $\eta_p^2 = 0.02$, between ROI and hemisphere, $F(3,57) = 2.62$, $p = 0.059$, $\eta_p^2 = 0.12$, or between relation, ROI and hemisphere, $F(3,57) = 1.68$, $p = 0.182$, $\eta_p^2 = 0.08$.

Multivariate pattern analysis in left and right ROIs

As shown in Fig. S1c, Classification accuracy for facing dyads was significantly above chance in the right EBA, $t(19) = 2.96$, $p = 0.008$, but did not approach significance in the left EBA, $t(19) = 1.88$, $p = 0.075$. Classification accuracy for nonfacing dyads was not significant in either EBA site (left: $t(19) = 1.40$, $p = 0.179$; right: $t(19) < 1$, *n.s.* The same analysis yielded no significant effects in all other ROIs (Left FFA: test on facing dyads: $t(19) < 1$, *n.s.*, on nonfacing dyads: $t(19) < 1$, *n.s.*; Right FFA: test on facing dyads: $t(19) < 1$, *n.s.*, on nonfacing dyads: , $t(19) = 1.23$, $p = 0.234$; Left PPA: test on facing dyads: $t(19) < 1$, *n.s.*, on nonfacing dyads: $t(19) = 1.34$, $p = 0.196$; Right PPA: test on facing dyads: $t(19) < 1$, *n.s.*, on nonfacing dyads: , $t(19) < 1$, *n.s*; Left EVC: test on facing dyads: $t(19) < 1$, *n.s.*, on

nonfacing dyads: $t(19) = 1.64$, $p = 0.118$; Right EVC: test on facing dyads: $t(19) = 1.28$, $p = 0.217$, on nonfacing dyads: , $t(19) = 1.41$, $p = 0.175$).

Accuracy and RT results with fMRI-subjects only (N= 15)

For bodies, an ANOVA on accuracy values, with stimulus (single bodies vs. facing bodies vs. nonfacing bodies) and orientation (upright vs. inverted) as repeated-measures factors, showed significant effects of stimulus, $F(2,28) = 3.71$, $p = 0.037$, $\eta_p^2 = 0.21$ and orientation, $F(1,14) = 8.68$, $p = 0.011$, $\eta_p^2 = 0.38$, and a significant two-way interaction, $F(2,28) = 3.58$, $p = 0.041$, $\eta_p^2 = 0.20$. The ANOVA on RTs showed an effects of stimulus, $F(2,28) = 8.43$, $p = 0.001$, $\eta_p^2 = 0.38$, and an effect of orientation, $F(1,14) = 22.91$, $p < 0.001$, $\eta_p^2 = 0.62$, but only a marginal interaction between the two factors, $F(2,38) = 3.15$, $p = 0.058$, $\eta_p^2 = 0.18$.

For chairs, an ANOVA on accuracy values, with stimulus (single chair vs. facing chairs vs. nonfacing chairs) and orientation (upright vs. inverted) as repeated-measures factors, showed a significant effect of stimulus, $F(2,28) = 5.34$, $p = 0.011$, $\eta_p^2 = 0.28$, no effect of orientation, $F(1,14) = 1.32$, $p > 0.250$, $\eta_p^2 = 0.09$, and no significant two-way interaction, $F(2,28) = 0.691$, $p > 0.250$, $\eta_p^2 = 0.05$. The ANOVA on RTs showed an effect of stimulus, $F(2,28) = 5.83$, $p = 0.008$, $\eta_p^2 = 0.29$, a significant effect of orientation, $F(1,14) = 21.62$, $p < 0.001$, $\eta_p^2 = 0.61$, but no significant interaction between the two factors, $F(2,28) = 1.42$, $p > 0.250$, $\eta_p^2 = 0.09$.

Accuracy and RT results for chair-trials (N = 20)

An ANOVA on accuracy values, with stimulus (single chair vs. facing chairs vs. nonfacing chairs) and orientation (upright vs. inverted) as repeated-measures factors, showed significant effects of stimulus, $F(2,38) = 3.94$, $p = 0.028$, $\eta_p^2 = 0.17$, no effect of orientation, $F(1,19) = 1.15$, $p > 0.250$, $\eta_p^2 = 0.06$, and no significant two-way interaction, $F(2,38) = 2.47$, $p = 0.10$, $\eta_p^2 = 0.11$. The ANOVA on RTs showed no effects of stimulus, $F(2,38) = 2.75$, $p = 0.077$, $\eta_p^2 = 0.13$, a significant effect of orientation, $F(1,19) = 30.08$, $p < 0.001$, $\eta_p^2 = 0.61$, but no significant interaction between the two factors, $F(2,38) = 2.52$, $p = 0.094$, $\eta_p^2 = 0.12$.

Figure Caption

Figure S1. Effects of number of bodies (in the whole-brain analysis) and of spatial relation between bodies (facing vs. nonfacing) in the functionally localized left and right EBA, FFA, PPA and EVC. (**a)** Left (L) and right (R) group random-effect map (N = 20) for the contrast of dyads vs. single bodies conditions. The color bar indicates *t* values. **(b)** Mean beta values (± within-subjects *SEM*) across participants, in each individually defined ROI left and right EBA, FFA, PPA and EVC, in response to facing and nonfacing dyads. $^{**}p \leq 0.01$. **(c)** Classification accuracies (± within-subjects *SEM*) for multi-class cross-decoding of patterns for single bodies in facing dyads and nonfacing dyads, in each individually defined ROI (EBA, FFA and PPA and EVC) separately for left and right hemisphere. Horizontal grey bar represents the chance level (25%). Asterisks indicate accuracy of classification significantly above chance. $^{**}p < .01$.

Figure S2. Average beta values across participants, in the EBA-ROI using voxels counts from 50 to 500 voxels, in response to facing and nonfacing dyads.

Figure S1

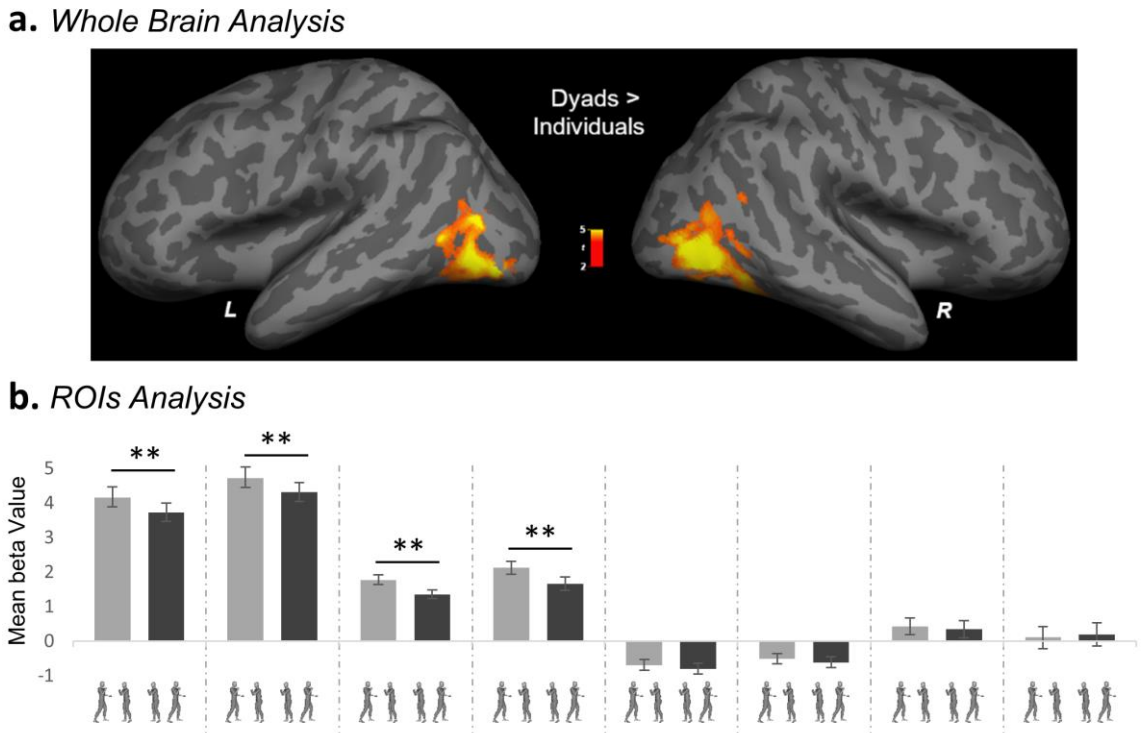

Figure S2