Supplementary Material

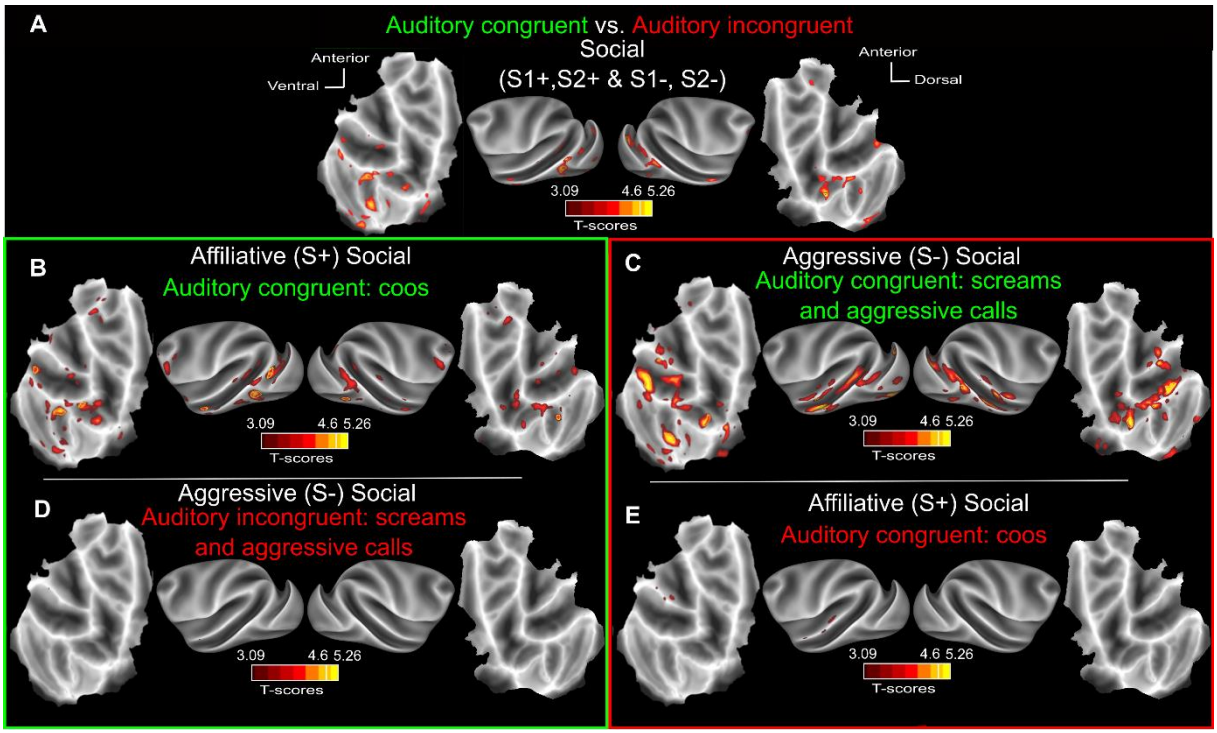

Figure S1: Auditory activations depend on semantic congruence with visual context in social blocked conditions. A) Whole-brain activation maps of the S1+, S2+ (social affiliative 1 & 2), S1- (social aggressive) and S2- (social escape) runs, for the *auditory congruent vs auditory incongruent* (relative to the visual context) contrast. B) Whole-brain activation map for the S+ (social affiliative, S1+&S2+) auditory congruent (coos, dark green, AC vs. Fx) and auditory incongruent (aggressive calls and screams, dark red, AI vs. Fx) conditions. C) Whole-brain activation map for the S- (social negative, S1-&S2-) auditory congruent (aggressive calls and screams, dark green, AC vs. Fx) and auditory incongruent (coos, dark red, AI vs. Fx) conditions. Darker shades of red indicate level of significance at $p<0.001$ uncorrected, t-score 3.09. Lighter shades of yellow and brown outlines indicate level of significance at $p<0.05$ FWE, t-score 4.6.

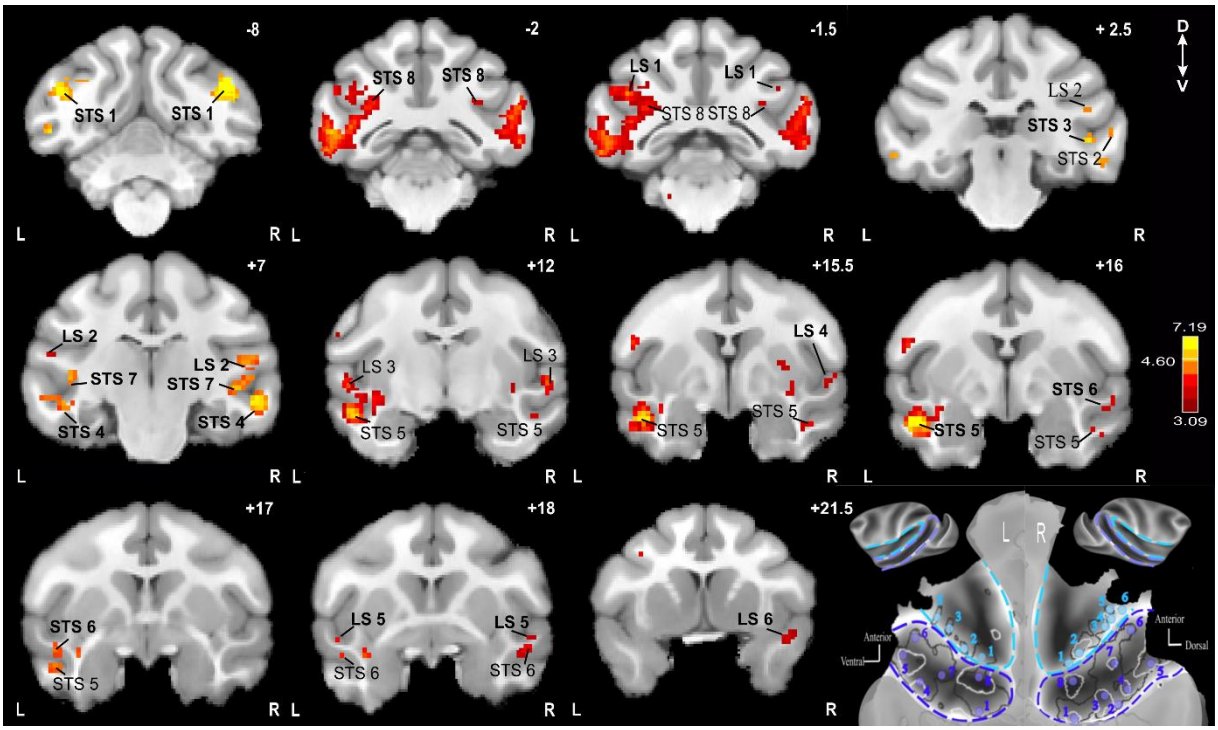

Figure S2: Peak activations that were used to define the ROIs of interest, on coronal slices, based on the AC vs. Fx contrast presented in (Figure 2 and Figure 4). Antero-posterior level relative to the intra-aural line indicated at the top right corner of each slice, in millimeters. Bold fonts refer to the location peak. Normal fonts refer to cortical activation extending beyond the peak. Activation thresholds were varied on some sections in order to clearly show the existence of local activation maxima. Activation color-scale was however kept constant across all slices. Down-left panel: ROIs locations on flatmaps (lateral sulcus; light blue; superior temporal sulcus: dark blue), same conventions as in Figure 5.

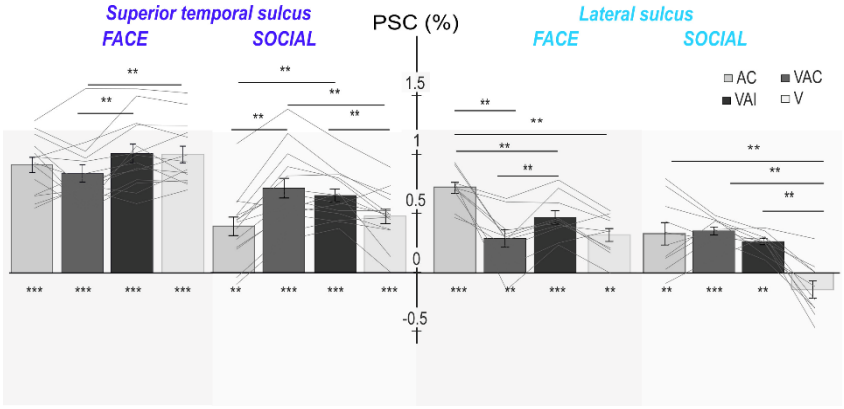

Figure S3: **Percentage of signal change (%PSC) across all lateral sulcus (light blue) and superior temporal sulci (dark blue) ROIs of both hemispheres, comparing unimodal and multimodal congruent and incongruent conditions.** Statistical differences relative to fixation are between conditions are indicates as follows: **, p<0.01 (Wilcoxon non-parametric test).

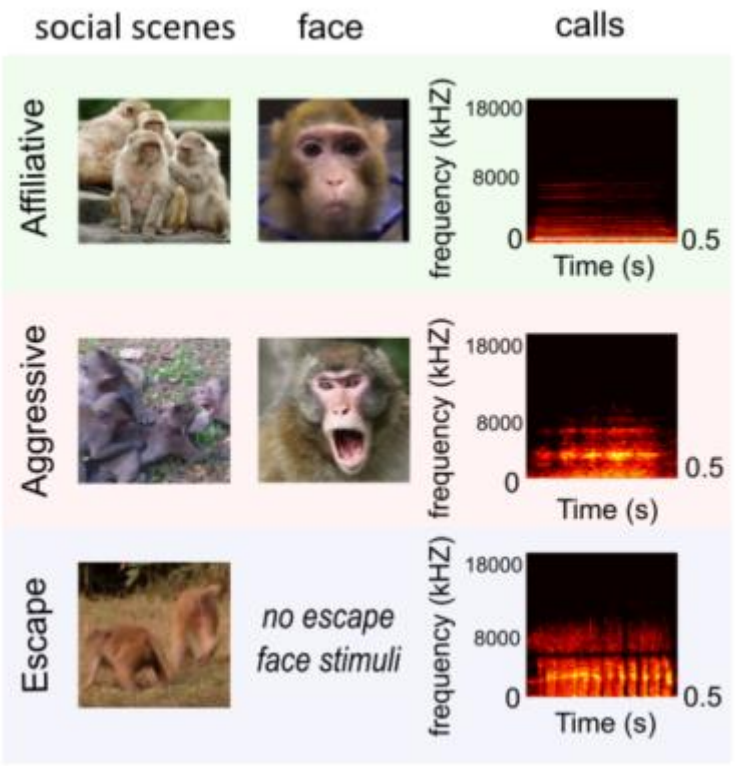

Figure S4: **Example of visual and auditory stimuli**. At the right are shown examples of visual stimuli used for social and face blocked conditions. On the left, congruent calls spectrograms are associated to the visual stimuli are shown. The affiliative call is a coos, the aggressive congruent auditory stimulus is an aggressive call and the escape call is a scream. Stimuli were not strictly normalized in terms of in low visual and auditory feature properties, thus making their social meaning the dominant cue across the different stimuli of a given category.

Table S1: Whole brain gPPI functional connectivity analysis for the left and right lateral sulcus and the left and right superior temporal sulcus ROIs. Highlighted are the cortical regions showing at least one voxel with significant correlation with seed regions (p<0.005 uncorrected).

Left LS	IPS	Insula	dlPFC (area 46)	STS	ACC	OFC	hippocampus	amygdala	dorsal pulvinar
F+	+	+	+	+	-	-	-	+	-
F-	+	+	+	+	+	+	-	+	-
S1-	+	-	+	+	+	+	+	+	-
S2-	+	-	+	+	+	+	-	-	-
S1+	+	+	+	+	+	+	+	+	+
S2+	-	+	+	+	+	+	+	-	+

Right LS	IPS	Insula	dlPFC (area 46)	STS	ACC	OFC	hippocampus	amygdala	dorsal pulvinar
F+	+	+	+	+	-	+	-	+	-
F-	+	-	+	+	-	+	-	+	-
S1-	+	-	+	+	+	+	+	+	+
S2-	+	-	+	+	+	-	+	+	+
S1+	-	-	+	+	+	+	+	-	-
S2+	+	+	+	+	+	+	+	+	+

Left STS	IPS	Insula	dlPFC (area 46)	LS	ACC	OFC	hippocampus	amygdala	dorsal pulvinar
F+	+	-	+	+	-	+	+	+	-
F-	-	+	+	+	+	+	+	-	+
S1-	+	-	-	+	+	+	+	-	+
S2-	+	+	-	+	+	+	-	+	+
S1+	+	+	+	+	+	+	-	-	-
S2+	+	-	+	+	-	-	+	+	-

Right STS	IPS	Insula	dlPFC (area 46)	LS	ACC	OFC	hippocampus	amygdala	dorsal pulvinar
F+	+	+	-	+	+	+	-	+	+
F-	+	+	+	-	+	+	+	+	-
S1-	+	-	+	+	+	-	-	+	-
S2-	+	+	-	-	+	+	-	-	-
S1+	+	-	-	+	+	+	+	+	-
S2+	+	+	+	+	+	+	+	+	+