Supplementary Materials

Effect of auditory input on activations in infant diverse cortical regions during audio-visual processing

Hama Watanabe [1], Fumitaka Homae [2], Tamami Nakano [3], Daisuke Tsuzuki [4], Lkhamsuren Enkhtur [5], Kiyotaka Nemoto [6], Ippeita Dan [4], and Gentaro Taga [1, 7]

[1] Graduate School of Education, University of Tokyo, 7-3-1 Hongo, Bunkyo-ku, Tokyo 113-0033, Japan

[2] Department of Language Sciences, Tokyo Metropolitan University, 1-1 Minami Osawa, Hachioji, Tokyo 192-0397, Japan

[3] Department of Physiology, School of Medicine, Juntendo University, 2-1-1 Hongo, Bunkyo-ku, Tokyo 113-8421, Japan

[4] Center for Development of Advanced Medical Technology, Jichi Medical University, 311-1 Yakushiji, Shimotsuke, Tochigi 329-0498, Japan

[5] Graduate School of System and Information Engineering, University of Tsukuba, 1-1-1 Tennodai, Tsukuba, Ibaraki 305-8577, Japan

[6] Department of Psychiatry, Graduate School of Comprehensive Human Sciences, University of Tsukuba, 1-1-1 Tennodai, Tsukuba, Ibaraki 305-8577, Japan

[7] Japan Science and Technology Agency (CREST), 4-1-8 Honcho, Kawaguchi, Saitama 332-0012, Japan

Table SI. Anatomical locations of the 94 measurement channels.

(Virtual registration via adult AAL template)

Left hemisphere

Ch No.	Position x	y	z	SD	Anatom Label (AAL)	%
L1	-13.3	-96.4	30.1	9.8	Occipital_Sup_L	83.9
					Cuneus_L	16.1
L2	-14.4	-105.5	6.6	8.2	Occipital_Mid_L	82.4
					Occipital_Sup_L	17.1
					Calcarine_L	0.5
L3	-22.0	-87.5	41.9	9.7	Occipital_Sup_L	78.7
					Occipital_Mid_L	15.8
					Parietal_Inf_L	4.7
					Parietal_Sup_L	0.8
L4	-22.5	-99.9	17.4	9.5	Occipital_Mid_L	52.4
					Occipital_Sup_L	47.6
L5	-23.7	-103.4	-5.3	7.2	Occipital_Mid_L	55.3
					Occipital_Inf_L	30.7
					Calcarine_L	14.0
L6	-31.6	-90.2	31.4	9.2	Occipital_Mid_L	72.1
					Occipital_Sup_L	27.9
L7	-32.8	-98.3	4.8	8.4	Occipital_Mid_L	100.0
L8	-37.9	-80.8	42.6	7.3	Occipital_Mid_L	68.5
					Parietal_Inf_L	26.0
					Angular_L	5.5
L9	-41.8	-88.9	18.6	8.2	Occipital_Mid_L	100.0
L10	-41.2	-91.8	-7.8	6.6	Occipital_Mid_L	82.2
					Lingual_L	10.3
					Occipital_Inf_L	7.5
L11	-47.7	-78.9	31.4	7.6	Occipital_Mid_L	55.6
					Angular_L	44.4
L12	-49.8	-83.5	4.6	6.6	Occipital_Mid_L	100.0
L13	-51.1	-68.3	42.3	7.1	Angular_L	92.0
					Occipital_Mid_L	6.4
					Parietal_Inf_L	1.6
L14	-55.2	-72.3	18.4	7.0	Temporal_Mid_L	55.3
					Occipital_Mid_L	36.4
					Angular_L	8.3
L15	-55.7	-72.6	-8.1	5.7	Occipital_Inf_L	96.5
					Temporal_Inf_L	3.5
L16	-59.3	-61.7	30.9	6.9	Angular_L	99.3
					Supramarginal_L	0.7
L17	-62.3	-62.8	4.1	5.3	Temporal_Mid_L	100.0
L18	-60.1	-51.1	42.3	7.1	Parietal_Inf_L	75.0
					Supramarginal_L	19.3
					Angular_L	5.7
L19	-65.6	-53.1	17.5	5.8	Temporal_Sup_L	48.0
					Temporal_Mid_L	41.0
					Supramarginal_L	11.0
L20	-66.1	-51.4	-9.6	4.0	Temporal_Mid_L	94.1
					Temporal_Inf_L	5.9
L21	-65.4	-42.4	31.1	6.5	Supramarginal_L	100.0
L22	-68.9	-41.9	2.9	4.7	Temporal_Mid_L	100.0
L23	-64.9	-33.6	42.5	6.0	Supramarginal_L	92.0
					Parietal_Inf_L	8.0
L24	-68.5	-31.6	17.4	6.7	Temporal_Sup_L	67.6
					Supramarginal_L	32.4
L25	-70.1	-28.3	-10.7	4.6	Temporal_Mid_L	100.0
L26	-67.0	-21.1	31.0	6.6	Supramarginal_L	71.6
					Postcentral_L	28.4
L27	-69.0	-19.4	1.7	5.8	Temporal_Mid_L	79.8
					Temporal_Sup_L	20.2
L28	-62.0	-11.2	40.8	6.3	Postcentral_L	91.8
					Supramarginal_L	8.2
L29	-66.3	-5.3	18.5	5.4	Postcentral_L	100.0
L30	-66.5	-4.5	-13.1	4.7	Temporal_Mid_L	100.0
L31	-61.6	5.9	29.0	5.1	Precentral_L	85.5
					Postcentral_L	11.8
					Frontal_Inf_Oper_L	2.6
L32	-60.9	9.5	5.8	5.6	Frontal_Inf_Oper_L	55.8
					Rolandic_Oper_L	42.1
					Temporal_Pole_Sup_L	2.1
L33	-53.0	16.5	40.0	7.2	Frontal_Mid_L	50.0
					Precentral_L	34.7
					Frontal_Inf_Oper_L	15.3
L34	-57.9	24.1	16.6	5.1	Frontal_Inf_Tri_L	97.5
					Frontal_Inf_Oper_L	2.5
L35	-54.0	29.5	-6.9	7.1	Frontal_Inf_Orb_L	82.5
					Frontal_Inf_Tri_L	16.8
					Temporal_Pole_Sup_L	0.7
L36	-50.0	33.4	28.0	6.0	Frontal_Inf_Tri_L	74.2
					Frontal_Mid_L	25.8
L37	-53.1	40.3	2.1	5.2	Frontal_Inf_Tri_L	92.8
					Frontal_Inf_Orb_L	7.2
L38	-39.5	38.5	38.7	5.9	Frontal_Mid_L	100.0
L39	-44.8	49.6	16.3	5.3	Frontal_Mid_L	81.9
					Frontal_Inf_Tri_L	18.1
L40	-44.7	53.4	-7.8	3.8	Frontal_Mid_Orb_L	97.1
					Frontal_Inf_Orb_L	2.9
L41	-33.8	54.2	27.9	5.4	Frontal_Mid_L	98.5
					Frontal_Sup_L	1.5
L42	-36.9	62.8	3.8	5.1	Frontal_Mid_L	60.0
					Frontal_Sup_L	30.0
					Frontal_Mid_Orb_L	10.0
L43	-19.7	53.1	39.9	5.6	Frontal_Sup_L	98.6
					Frontal_Mid_L	1.4
L44	-23.2	66.6	17.4	5.2	Frontal_Sup_L	100.0
L45	-23.8	67.9	-4.8	4.6	Frontal_Sup_Orb_L	80.3
					Frontal_Mid_Orb_L	9.8
					Frontal_Sup_L	9.8
L46	-10.1	63.4	31.5	5.1	Frontal_Sup_Medial_L	78.1
					Frontal_Sup_L	21.9
L47	-12.2	72.2	7.3	4.7	Frontal_Sup_L	64.9
					Frontal_Sup_Medial_L	35.1

Right hemisphere

Ch No.	Position x	y	z	SD	Anatom Label (AAL)	%
R1	12.7	-95.7	29.5	10.2	Occipital_Sup_R	69.0
					Cuneus_R	19.5
					Cuneus_L	11.4
R2	13.3	-104.2	6.1	8.2	Calcarine_R	32.7
					Occipital_Sup_R	30.3
					Cuneus_R	22.3
					Calcarine_L	14.7
R3	20.3	-88.0	42.4	9.4	Occipital_Sup_R	53.1
					Cuneus_R	46.5
					Parietal_Sup_R	0.4
R4	21.2	-100.2	16.7	8.5	Occipital_Sup_R	88.6
					Cuneus_R	10.4
					Occipital_Mid_R	1.0
R5	21.8	-102.8	-5.8	8.3	Lingual_R	47.9
					Occipital_Inf_R	35.7
					Calcarine_R	15.0
					Occipital_Mid_R	1.4
R6	29.6	-89.8	30.3	8.9	Occipital_Sup_R	57.7
					Occipital_Mid_R	42.3
R7	30.9	-98.4	4.6	7.4	Occipital_Mid_R	87.1
					Calcarine_R	7.9
					Occipital_Sup_R	5.0
R8	37.0	-80.3	42.5	7.0	Occipital_Sup_R	40.4
					Occipital_Mid_R	35.1
					Angular_R	23.7
					Parietal_Sup_R	0.9
R9	40.4	-88.4	17.7	7.7	Occipital_Mid_R	100.0
R10	40.4	-91.1	-8.3	7.0	Occipital_Inf_R	100.0
R11	46.6	-78.1	31.2	7.3	Occipital_Mid_R	77.1
					Angular_R	22.9
R12	49.1	-83.0	4.9	6.5	Occipital_Mid_R	89.4
					Occipital_Inf_R	10.6
R13	50.5	-67.5	42.7	6.6	Angular_R	99.0
					Parietal_Inf_R	1.0
R14	54.6	-72.1	18.3	6.8	Temporal_Mid_R	87.0
					Occipital_Mid_R	13.0
R15	54.8	-72.6	-9.1	6.8	Temporal_Inf_R	60.0
					Occipital_Inf_R	40.0
R16	59.0	-61.1	31.0	6.0	Angular_R	97.8
					Occipital_Mid_R	2.2
R17	61.7	-62.2	3.9	5.3	Temporal_Mid_R	100.0
R18	60.7	-50.6	42.7	6.3	Parietal_Inf_R	71.4
					Supramarginal_R	21.0
					Angular_R	7.6
R19	65.2	-52.2	17.4	5.8	Temporal_Sup_R	50.5
					Temporal_Mid_R	49.5
R20	66.8	-50.8	-8.9	4.4	Temporal_Inf_R	58.8
					Temporal_Mid_R	41.2
R21	67.0	-41.7	31.0	6.0	Supramarginal_R	100.0
R22	70.3	-41.6	3.1	4.6	Temporal_Mid_R	100.0
R23	66.4	-32.1	42.6	5.5	Supramarginal_R	100.0
R24	70.0	-30.9	16.9	5.9	Temporal_Sup_R	100.0
R25	71.8	-28.8	-10.2	3.9	Temporal_Mid_R	100.0
R26	68.9	-21.4	30.4	6.2	Supramarginal_R	100.0
R27	71.0	-18.7	2.9	4.2	Temporal_Sup_R	100.0
R28	63.6	-10.4	40.5	6.2	Postcentral_R	98.1
					Precentral_R	1.9
R29	67.9	-5.7	17.9	5.1	Postcentral_R	95.0
					Rolandic_Oper_R	5.0
R30	67.7	-5.2	-11.3	5.1	Temporal_Mid_R	57.9
					Temporal_Sup_R	42.1
R31	63.9	6.0	29.5	5.1	Precentral_R	90.9
					Postcentral_R	9.1
R32	62.4	7.9	5.8	5.8	Rolandic_Oper_R	57.7
					Temporal_Pole_Sup_R	22.7
					Temporal_Sup_R	14.4
					Frontal_Inf_Oper_R	5.2
R33	53.8	15.3	40.4	6.3	Frontal_Inf_Oper_R	35.5
					Precentral_R	34.6
					Frontal_Mid_R	29.9
R34	60.0	24.3	17.2	4.7	Frontal_Inf_Tri_R	83.8
					Frontal_Inf_Oper_R	16.2
R35	55.4	27.5	-6.4	7.0	Frontal_Inf_Orb_R	94.2
					Frontal_Inf_Tri_R	4.3
					Temporal_Pole_Sup_R	1.4
R36	52.9	33.1	29.1	5.1	Frontal_Inf_Tri_R	80.9
					Frontal_Mid_R	19.1
R37	55.8	39.4	3.1	4.4	Frontal_Inf_Tri_R	100.0
R38	42.0	38.0	39.6	5.5	Frontal_Mid_R	100.0
R39	47.0	49.7	16.7	4.5	Frontal_Mid_R	100.0
R40	47.3	53.8	-7.7	4.0	Frontal_Mid_Orb_R	89.7
					Frontal_Inf_Orb_R	10.3
R41	35.9	54.4	28.4	4.9	Frontal_Mid_R	100.0
R42	39.1	62.5	4.7	4.6	Frontal_Mid_R	100.0
R43	22.3	53.1	40.0	5.7	Frontal_Sup_R	100.0
R44	25.4	67.2	17.3	4.4	Frontal_Sup_R	100.0
R45	27.3	68.6	-4.8	4.2	Frontal_Sup_Orb_R	86.3
					Frontal_Sup_R	11.8
					Frontal_Mid_Orb_R	2.0
R46	12.9	64.0	30.4	5.7	Frontal_Sup_Medial_R	54.5
					Frontal_Sup_R	45.5
R47	14.2	72.0	7.3	4.2	Frontal_Sup_Medial_R	65.4
					Frontal_Sup_R	34.6

Note. Anatomical labeles are based on the Automated Anatomical Labeling map (AAL map) (Tzourio-Mazoyer et al., 2002). All values are in millimeters. SD stands for standard deviation. Abbreviations: L =Left hemispheret, R = Right hemisphere, Sup = Superior, Mid = Middle, Inf = Inferior, Oper = Opercular part, Tri = Triangular part, Orb = Orbital part.

Table SII. Locations of international 10-20 cortical projection points.

	Position			SD
	x	y	z	
Fpz	3.0	68.1	-3.0	5.4
Fp1	-22.0	67.8	-6.5	4.0
Fp2	25.6	68.0	-7.0	3.6
Fz	1.5	44.2	49.5	5.9
F3	-39.5	44.4	31.9	6.2
F4	42.2	43.8	33.3	6.1
F7	-51.9	38.0	-10.0	4.5
F8	53.8	37.7	-9.8	3.9
Cz	0.8	-13.5	74.1	9.8
C3	-54.6	-15.9	54.5	6.6
C4	56.1	-15.7	54.0	6.8
T3	-70.0	-18.2	-11.8	4.8
T4	70.9	-17.8	-10.8	4.1
Pz	-1.1	-66.5	62.7	8.4
P3	-45.3	-68.8	48.9	6.7
P4	44.3	-68.5	49.1	6.3
T5	-59.5	-67.4	-1.8	4.9
T6	58.7	-66.5	-1.9	5.5
Oz	-3.2	-102.6	12.2	10.2
O1	-23.9	-102.3	7.4	8.1
O2	22.6	-102.7	7.2	7.0

Note. All values are in millimeters.
SD stands for standard deviation.

Table SIII. Anatomical locations of the 94 measurement channels.

(Virtual registration via neonate AAL template)

Left hemisphere

Ch No.	Position x	y	z	SD	Anatom Label (AAL)	%
L1	-13.3	-96.4	30.1	9.8	Cuneus_L	59.1
					Occipital_Sup_L	40.9
L2	-14.4	-105.5	6.6	8.2	Calcarine_L	85.2
					Occipital_Mid_L	12.3
					Occipital_Sup_L	2.5
L3	-22.0	-87.5	41.9	9.7	Occipital_Sup_L	78.5
					Occipital_Mid_L	11.4
					Cuneus_L	10.2
L4	-22.5	-99.9	17.4	9.5	Occipital_Mid_L	67.9
					Occipital_Sup_L	32.1
L5	-23.7	-103.4	-5.3	7.2	Lingual_L	72.2
					Occipital_Inf_L	19.4
					Calcarine_L	5.6
					Occipital_Mid_L	2.8
L6	-31.6	-90.2	31.4	9.2	Occipital_Mid_L	79.5
					Occipital_Sup_L	20.5
L7	-32.8	-98.3	4.8	8.4	Occipital_Mid_L	85.8
					Occipital_Inf_L	14.2
L8	-37.9	-80.8	42.6	7.3	Occipital_Mid_L	98.4
					Parietal_Inf_L	1.6
L9	-41.8	-88.9	18.6	8.2	Occipital_Mid_L	100.0
L10	-41.2	-91.8	-7.8	6.6	Lingual_L	50.0
					Occipital_Inf_L	40.9
					Occipital_Mid_L	4.5
					Fusiform_L	4.5
L11	-47.7	-78.9	31.4	7.6	Occipital_Mid_L	97.3
					Angular_L	2.7
L12	-49.8	-83.5	4.6	6.6	Occipital_Mid_L	73.3
					Occipital_Inf_L	26.7
L13	-51.1	-68.3	42.3	7.1	Angular_L	96.6
					Occipital_Mid_L	3.4
L14	-55.2	-72.3	18.4	7.0	Temporal_Mid_L	50.9
					Occipital_Mid_L	49.1
L15	-55.7	-72.6	-8.1	5.7	Occipital_Inf_L	100.0
L16	-59.3	-61.7	30.9	6.9	Angular_L	77.1
					Temporal_Mid_L	22.9
L17	-62.3	-62.8	4.1	5.3	Temporal_Mid_L	100.0
L18	-60.1	-51.1	42.3	7.1	Angular_L	56.7
					Parietal_Inf_L	36.1
					Supramarginal_L	7.2
L19	-65.6	-53.1	17.5	5.8	Temporal_Mid_L	100.0
L20	-66.1	-51.4	-9.6	4.0	Temporal_Inf_L	55.6
					Temporal_Mid_L	44.4
L21	-65.4	-42.4	31.1	6.5	Supramarginal_L	89.9
					Temporal_Sup_L	10.1
L22	-68.9	-41.9	2.9	4.7	Temporal_Mid_L	100.0
L23	-64.9	-33.6	42.5	6.0	Parietal_Inf_L	64.9
					Supramarginal_L	35.1
L24	-68.5	-31.6	17.4	6.7	Temporal_Sup_L	94.1
					Temporal_Mid_L	3.9
					Supramarginal_L	2.0
L25	-70.1	-28.3	-10.7	4.6	Temporal_Mid_L	100.0
L26	-67.0	-21.1	31.0	6.6	Supramarginal_L	100.0
L27	-69.0	-19.4	1.7	5.8	Temporal_Mid_L	88.0
					Temporal_Sup_L	12.0
L28	-62.0	-11.2	40.8	6.3	Postcentral_L	72.6
					Supramarginal_L	26.0
					Parietal_Inf_L	1.4
L29	-66.3	-5.3	18.5	5.4	Postcentral_L	100.0
L30	-66.5	-4.5	-13.1	4.7	Temporal_Mid_L	100.0
L31	-61.6	5.9	29.0	5.1	Precentral_L	81.0
					Postcentral_L	19.0
L32	-60.9	9.5	5.8	5.6	Rolandic_Oper_L	72.0
					Frontal_Inf_Oper_L	28.0
L33	-53.0	16.5	40.0	7.2	Precentral_L	55.1
					Frontal_Mid_L	44.9
L34	-57.9	24.1	16.6	5.1	Frontal_Inf_Tri_L	80.0
					Frontal_Inf_Oper_L	20.0
L35	-54.0	29.5	-6.9	7.1	Frontal_Inf_Orb_L	60.7
					Frontal_Inf_Tri_L	39.3
L36	-50.0	33.4	28.0	6.0	Frontal_Inf_Tri_L	54.0
					Frontal_Mid_L	46.0
L37	-53.1	40.3	2.1	5.2	Frontal_Inf_Tri_L	100.0
L38	-39.5	38.5	38.7	5.9	Frontal_Mid_L	100.0
L39	-44.8	49.6	16.3	5.3	Frontal_Mid_L	100.0
L40	-44.7	53.4	-7.8	3.8	Frontal_Mid_Orb_L	100.0
L41	-33.8	54.2	27.9	5.4	Frontal_Mid_L	100.0
L42	-36.9	62.8	3.8	5.1	Frontal_Mid_L	100.0
L43	-19.7	53.1	39.9	5.6	Frontal_Sup_L	100.0
L44	-23.2	66.6	17.4	5.2	Frontal_Sup_L	95.8
					Frontal_Mid_L	4.2
L45	-23.8	67.9	-4.8	4.6	Frontal_Sup_L	44.4
					Frontal_Sup_Orb_L	40.7
					Frontal_Mid_L	7.4
					Frontal_Mid_Orb_L	7.4
L46	-10.1	63.4	31.5	5.1	Frontal_Sup_Medial_L	63.6
					Frontal_Sup_L	36.4
L47	-12.2	72.2	7.3	4.7	Frontal_Sup_L	55.9
					Frontal_Sup_Medial_L	44.1

Right hemisphere

Ch No.	Position x	y	z	SD	Anatom Label (AAL)	%
R1	12.7	-95.7	29.5	10.2	Occipital_Sup_R	55.9
					Cuneus_R	44.1
					Cuneus_L	11.4
R2	13.3	-104.2	6.1	8.2	Calcarine_R	54.4
					Lingual_R	40.4
					Occipital_Inf_R	5.3
R3	20.3	-88.0	42.4	9.4	Occipital_Sup_R	70.1
					Cuneus_R	22.9
					Occipital_Mid_R	7.0
R4	21.2	-100.2	16.7	8.5	Occipital_Sup_R	46.8
					Occipital_Mid_R	27.3
					Calcarine_R	18.0
					Cuneus_R	5.8
					Occipital_Inf_R	2.2
R5	21.8	-102.8	-5.8	8.3	Lingual_R	65.0
					Occipital_Inf_R	35.0
R6	29.6	-89.8	30.3	8.9	Occipital_Mid_R	66.4
					Occipital_Sup_R	33.6
R7	30.9	-98.4	4.6	7.4	Occipital_Inf_R	87.1
					Occipital_Mid_R	12.9
R8	37.0	-80.3	42.5	7.0	Occipital_Mid_R	92.7
					Angular_R	7.3
R9	40.4	-88.4	17.7	7.7	Occipital_Mid_R	100.0
R10	40.4	-91.1	-8.3	7.0	Occipital_Inf_R	100.0
R11	46.6	-78.1	31.2	7.3	Occipital_Mid_R	98.3
					Temporal_Mid_R	1.7
R12	49.1	-83.0	4.9	6.5	Occipital_Inf_R	74.4
					Occipital_Mid_R	24.4
					Temporal_Mid_R	1.3
R13	50.5	-67.5	42.7	6.6	Angular_R	99.0
					Occipital_Mid_R	1.0
R14	54.6	-72.1	18.3	6.8	Temporal_Mid_R	99.1
					Occipital_Mid_R	0.9
R15	54.8	-72.6	-9.1	6.8	Temporal_Inf_R	65.6
					Occipital_Inf_R	26.6
					Cerebelum_Crus1_R	4.7
					Fusiform_R	3.1
R16	59.0	-61.1	31.0	6.0	Angular_R	50.0
					Occipital_Mid_R	50.0
R17	61.7	-62.2	3.9	5.3	Temporal_Mid_R	63.9
					Temporal_Inf_R	36.1
R18	60.7	-50.6	42.7	6.3	Angular_R	72.2
					Parietal_Inf_R	27.8
						7.6
R19	65.2	-52.2	17.4	5.8	Temporal_Mid_R	100.0
R20	66.8	-50.8	-8.9	4.4	Temporal_Inf_R	100.0
R21	67.0	-41.7	31.0	6.0	Supramarginal_R	50.0
					Temporal_Sup_R	36.5
					Angular_R	13.5
R22	70.3	-41.6	3.1	4.6	Temporal_Mid_R	100.0
R23	66.4	-32.1	42.6	5.5	Supramarginal_R	100.0
R24	70.0	-30.9	16.9	5.9	Temporal_Sup_R	97.4
					Temporal_Mid_R	2.6
R25	71.8	-28.8	-10.2	3.9	Temporal_Mid_R	100.0
R26	68.9	-21.4	30.4	6.2	Supramarginal_R	91.9
					Temporal_Sup_R	8.1
R27	71.0	-18.7	2.9	4.2	Temporal_Sup_R	100.0
R28	63.6	-10.4	40.5	6.2	Supramarginal_R	70.2
					Postcentral_R	29.8
R29	67.9	-5.7	17.9	5.1	Postcentral_R	64.3
					Supramarginal_R	21.4
					Temporal_Sup_R	14.3
R30	67.7	-5.2	-11.3	5.1	Temporal_Mid_R	94.3
					Temporal_Sup_R	5.7
R31	63.9	6.0	29.5	5.1	Postcentral_R	100.0
R32	62.4	7.9	5.8	5.8	Rolandic_Oper_R	66.2
					Temporal_Sup_R	20.6
					Temporal_Pole_Sup_R	13.2
R33	53.8	15.3	40.4	6.3	Precentral_R	97.9
					Frontal_Mid_R	2.1
R34	60.0	24.3	17.2	4.7	Frontal_Inf_Oper_R	90.9
					Frontal_Inf_Tri_R	9.1
R35	55.4	27.5	-6.4	7.0	Frontal_Inf_Orb_R	63.3
					Temporal_Pole_Sup_R	21.1
					Frontal_Inf_Tri_R	15.6
R36	52.9	33.1	29.1	5.1	Frontal_Inf_Tri_R	51.6
					Frontal_Mid_R	29.0
					Frontal_Inf_Oper_R	19.4
R37	55.8	39.4	3.1	4.4	Frontal_Inf_Tri_R	100.0
R38	42.0	38.0	39.6	5.5	Frontal_Mid_R	100.0
R39	47.0	49.7	16.7	4.5	Frontal_Mid_R	100.0
R40	47.3	53.8	-7.7	4.0	Frontal_Inf_Orb_R	66.7
					Frontal_Mid_Orb_R	22.2
					Frontal_Inf_Tri_R	11.1
R41	35.9	54.4	28.4	4.9	Frontal_Mid_R	100.0
R42	39.1	62.5	4.7	4.6	Frontal_Mid_R	100.0
R43	22.3	53.1	40.0	5.7	Frontal_Sup_R	77.6
					Frontal_Mid_R	22.4
R44	25.4	67.2	17.3	4.4	Frontal_Sup_R	50.0
					Frontal_Mid_R	50.0
R45	27.3	68.6	-4.8	4.2	Frontal_Sup_Orb_R	53.3
					Frontal_Mid_R	26.7
					Frontal_Mid_Orb_R	13.3
					Frontal_Sup_R	6.7
R46	12.9	64.0	30.4	5.7	Frontal_Sup_R	71.2
					Frontal_Sup_Medial_R	28.8
R47	14.2	72.0	7.3	4.2	Frontal_Sup_R	68.0
					Frontal_Sup_Medial_R	32.0

Note. Anatomical labeles are based on the Automated Anatomical Labeling map (AAL map) (Tzourio-Mazoyer et al., 2002). All values are in millimeters. SD stands for standard deviation. Abbreviations: L =Left hemispheret, R = Right hemisphere, Sup = Superior, Mid = Middle, Inf = Inferior, Oper = Opercular part, Tri = Triangular part, Orb = Orbital part.

Note of Table SIII: Virtual Registration via neonate AAL template

To confirm the macroanatomical labeling obtained by the virtual registration implemented in the current study, we utilized a recently published macroanatomical atlas optimized for brains of neonates and 1- and 2-year-old infants (Shi et al. 2011). This atlas is based on automatic anatomical labeling (AAL) developed by Tzourio-Mazoyer et al. (2002), and has been built up in a template representing the brain of 2-year-old babies. This does not directly represent macroanatomical structures of neonate infants, but it does so indirectly as Shi et al. (2011) observed by longitudinal comparisons of the brains. These comparative studies showed that they are macroanatomically comparable.

Since the neonate AAL atlas was constructed on an arbitral space, it was transformed to the MNI space where our data were described. Therefore, we warped the neonate AAL atlas to the infant brain template constructed in the MNI space (Altaye et al. 2008). More specifically, we compared tissue probability maps of the 2 templates, extracted a deformation field using SPM8, and applied the deformation field to transform the neonate AAL atlas to the infant brain template in the MNI space.

As described in the main text, we performed the virtual registration of the NIRS optode and channel locations used in the current study to the neonate AAL atlas transformed to the MNI space. In essence, the 2 methods, i.e., adult-brain-mediated and neonate-brain-mediated virtual registration methods, yielded compatible macroanatomical labeling results.

References:

Altaye M. Holland S.K. Wilke M. Gaser C. (2008): Infant brain probability templates for MRI segmentation and normalization. Neuroimage, 43: 721-730.

Shi F, Yap P-T, Wu G, Jia H, Gilmore JH, Lin W, Shen D (2011): Infant brain atlases from neonates to 1- and 2-year-olds. PLoS ONE 6: e18746.

Tzourio-Mazoyer N, Landeau B, Papathanassiou D, Crivello F, Etard O, Delcroix N, Mazoyer B, Joliot M (2002): Automated anatomical labeling of activations in SPMusing a macroscopic anatomical parcellation of the MNI MRI single-subject brain. Neuroimage 15: 273-289.

Table SIV. Statistical results produced by *t*-test to identify channels showing significant increase of oxy-Hb signals in each time window on 8 channels of interests for both conditions.

Sound condition

		3.1-4.5 s		4.6-6.0 s		6.1-7.5 s		7.6-9.0 s		9.1-10.5 s		10.6-12.0 s		12.1-13.5 s	
Ch_No.	df	*t*-value		*t*-value		*t*-value		*t*-value		*t*-value		*t*-value		*t*-value	
L02	39	0.364		2.397	*	3.619	***	5.108	***	5.511	***	4.765	***	3.505	***
L10	41	2.008	*	3.138	**	3.332	**	2.694	**	1.859	*	0.59		-0.732	
L17	48	1.302		4.439	***	5.887	***	6.601	***	6.522	***	4.013	***	2.342	*
L18	48	2.717	**	5.969	***	6.84	***	6.298	***	5.204	***	3.854	***	2.116	*
L22	43	4.072	***	6.692	***	9.202	***	9.548	***	7.724	***	4.277	***	1.56	
L24	49	2.648	**	4.791	***	6.484	***	5.711	***	4.86	***	1.917	*	-0.988	
L36	49	1.935	*	4.26	***	5.467	***	5.619	***	5.447	***	3.644	***	2.281	*
L44	49	0.329		1.773	*	2.576	**	3.411	***	3.91	***	3.652	***	3.055	**

No-sound cndition

		3.1-4.5 s		4.6-6.0 s		6.1-7.5 s		7.6-9.0 s		9.1-10.5 s		10.6-12.0 s		12.1-13.5 s	
Ch_No.	df	*t*-value		*t*-value		*t*-value		*t*-value		*t*-value		*t*-value		*t*-value	
L02	41	-0.849		0.632		1.708	*	3.18	**	4.526	***	4.365	***	3.556	***
L10	42	2.264		2.671	**	2.915	**	3.229	**	3.408	***	2.784	**	2.31	*
L17	47	0.064		1.342		2.367	*	2.689	**	2.066	*	0.476		0.096	
L18	48	0.591		1.889		2.464	**	2.465	**	2.48	**	1.345		0.934	
L22	45	1.498		2.661	**	2.376	*	1.628		-0.462		-3.11	**	-3.857	***
L24	45	-0.591		0.47		0.161		-0.423		-1.854	*	-3.411	***	-2.437	**
L36	49	2.275		3.471	***	4.364	***	4.694	***	4.597	***	3.368	***	2.392	*
L44	49	-1.118		-0.851		-0.713		-0.266		0.295		-0.015		0.65	

Note. To determine the effective threshold for multiple statistical testing, an FDR procedure was used.
In all the tables, ***, **, and * indicate the channels that surpassed $p < 0.001$, $p < 0.01$, and $p < 0.05$, respectively, with regard to the hemoglobin signals.

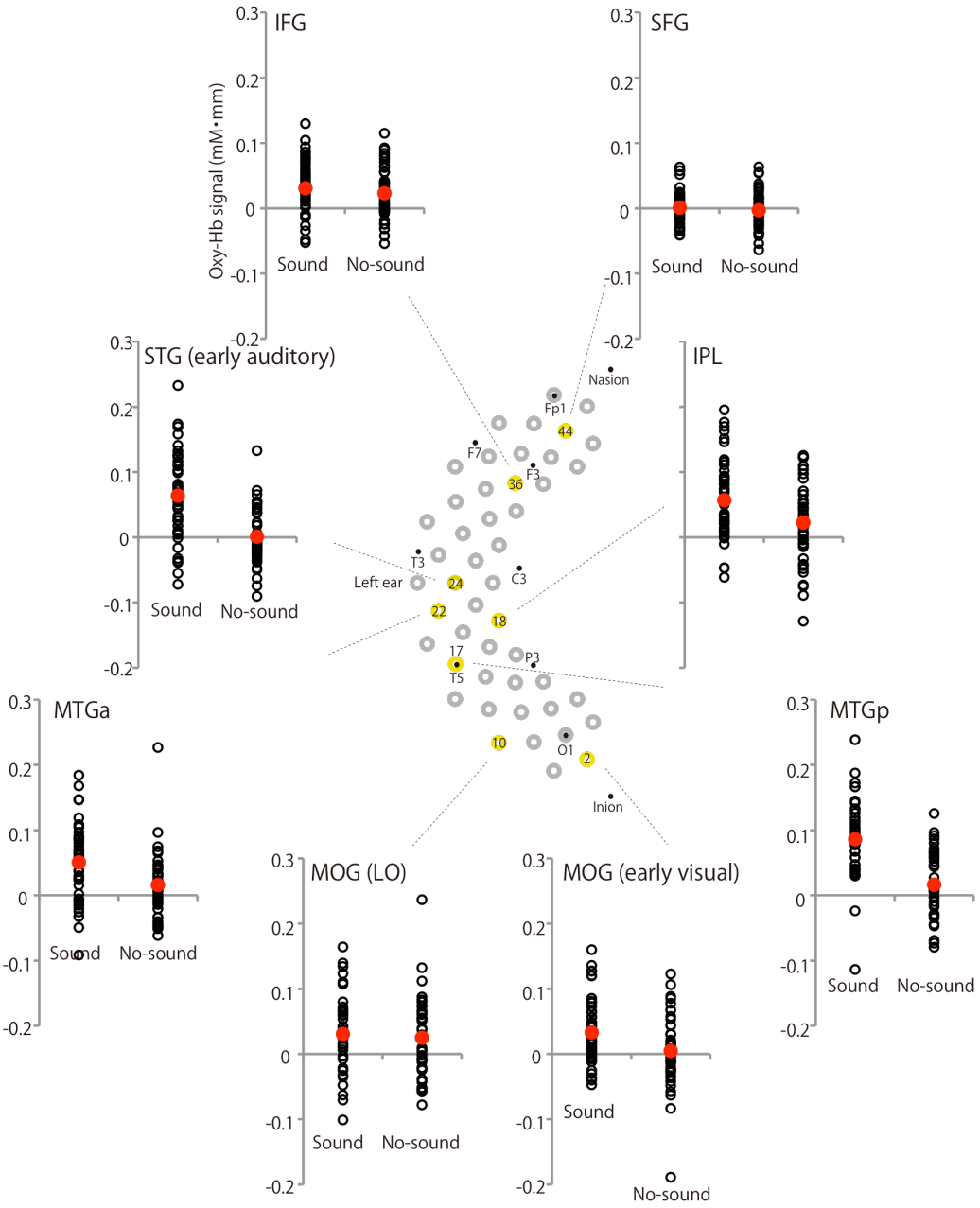

Figure S1. Individual distributions of hemodynamic responses on 8 channels of interests for both conditions. Each data shows response amplitude of oxy-Hb signals in the time window of 6.1-7.5 s. Black circles and red-filled circles describe individual data and averaged data of all infants, respectively. The displayed channels correspond to discrete cortical regions: the superior temporal gyrus (STG) including the early auditory region (L24); the anterior part of the middle temporal gyrus (MTGa) (L22); the middle occipital gyrus (MOG) including the early visual region (L2); the middle occipital gyrus (MOG) referred to as the lateral occipital (LO) region (L10); the posterior part of the middle temporal gyrus (MTGp) (L17); the inferior parietal lobule (IPL) (L18), the inferior frontal gyrus (IFG) (L36), and the superior frontal gyrus (SFG) (L44).