### Table 1. Demographic characteristics and main findings in the deaf population compared to normal hearing subjects.

| References       | Area of investigation | Method                                      | Participants characteristics | Deafness characteristics                                                                 | N° | Mean age ± SD (Range) | Sex (F/M) | Handed ness | Severity (number) | Onset, language | Hearing aids | Etiology | Statistical differences |
|------------------|-----------------------|---------------------------------------------|------------------------------|------------------------------------------------------------------------------------------|-----|-----------------------|------------|-------------|------------------|----------------|-------------|-----------|------------------------|
| Allen J., 2008   | insula                | manual volumetry                           | 25 D                         | 23.8 ± 4.1 (19-39)                                                                       | 38/28 | RH                    | > 90 (21), > 75 (3), > 55 dB (11) | preL, preS | yes for some, after 2 years old | NS       | GM: ↑ L post insula in D vs H | WM: ↑ R insula in D and HS vs H |
| Allen J., 2013   | CS, pars triangularis and opercularis, motor region | manual volumetry                           | 25 D                         | 23.8 ± 4.1 (19-39)                                                                       | 38/28 | RH                    | > 90 (21), > 75 (3), > 55 dB (11) | preL, preS | yes for some, after 2 years old | NS       | GM: ↑ total CS in D vs H, ↑ L CS in D vs H, R CS larger than the L in all groups; ↑ bilat pars triangularis in D vs H and HS |
| Amaral L., 2016  | Thal nuclei, IC, SC   | manual volumetry                           | 15 D                         | 20.4 ± 17.22                                                                            | 26/5  | RH                    | > 90 db                                  | preL, preS | no                       | NS       | GM: ↑ R vs L thal, lat gen nucl and IC |
| Emmorey K., 2003 | temp lobe, STG, HG, PT| manual volumetry                           | 25 D                         | 23.8 ± 4.1 (19-39)                                                                       | 28/22 | RH                    | > 90 (21), > 75 (3), > 55 dB (11) | preL, preS | yes for some, after 2 years old | NS       | GM: ↑ R STG and PT |
|                 |                       |                                             |                             |                                                                                          |       |                       |                         |                     | WM: ↓ bilat HG and STG |
| Feng G., 2018    | WB                    | VBM and MVPS (GM, WM)                      | 37 D                         | 17.9 months ± 7.81 (8-32/45)                                                            | /     |                       | > 70 dB (27), > 50 dB (10)                  | preL, /   | yes                       | NS       | GM: ↓ bilat STG, HG, parahippocampal gyrus, L medial FG, L precuneus, L lingual gyrus, R supramarginal gyrus, R middle Cing, R SDG |
| Fine L, 2005     | early visual cortex (V1-V4), motion area (MT), defined by fMRI | VBM (GM, WM)                  | 6 D                          | 27 ± 5.7                                                                                | 9/9   | RH                    | > 80 db                                  | preL, preS | NS                       | NS       | GM: no diff |
|                 |                       |                                             |                             |                                                                                          |       |                       |                         |                     | WM: no diff |
|                 |                       |                                             |                             |                                                                                          |       |                       |                         |                     | WM: no diff |
| Hribar M., 2014  | HG, WB                | CT, VBM, surface-based analysis (GM)        | 14 D                         | 35.4 ± 6.4 (23-50)                                                                      | 16/12 | RH                    | > 90 db                                  | preL, preS | no                       | NS       | GM: ↑ cerebellum |
|                 |                       |                                             |                             |                                                                                          |       |                       |                         |                     | WM: ↓ L HG |
| Kara A., 2006    | CC                    | manual volumetry                           | 18 D                         | 41.2 ± 7.5                                                                             | 0/36  | RH                    | > 90 db                                  | preL, preS | NS                       | NS       | GM: /                         |
|                 |                       |                                             |                             |                                                                                          |       |                       |                         |                     | WM: no diff |
| Kim D., 2009     | WB                    | VBM (WM)                                   | 13 D                         | 20.3 ± 6.8                                                                             | 19/23 | RH                    | > 90 db                                  | preL, NS  | "not for brain developmen
tal period" |
|                 |                       |                                             |                             |                                                                                          |       |                       |                         |                     | WM: ↓ bilat STG and temp sub-gyrual areas, L pariet, L SFG and L medial FG |
| Kim E., 2014     | primary auditory cortex | VBM (GM)                                  | 8 D                          | 50.4 ± 6.1                                                                             | 15/15 | RH                    | > 70 db                                  | preL, postL, oral | yes                       | NS       | GM: no diff |
| Kumar U., 2018   | WB                    | VBM (GM, WM), source-based tensor-based morphometry (GM, WM) | 50 D                         | 19.5 ± 7.1                                                                             | 19/5  | RH                    | > 90 db                                  | preL, preS | no                       | NS       | GM: ↑ bilat MFG, bilat ITG, bilat fus, R cerebellum, L suppl motor area, R inf pariet region, ↑ CT bilat STG |
|                 |                       |                                             |                             |                                                                                          |       |                       |                         |                     | WM: ↓ bilat STG |
| Lepore N., 2010  | CC, lobes, WB         | VBM (GM, WM), source-based tensor-based morphometry (GM, WM) | 14 D                         | 29.5 ± 21.52                                                                          | 15/15 | RH                    | > 90 db                                  | preL, preS | NS                       | NS       | GM: ↑ STG, R cerebellum, R MFG, L IFG, bilat preC |
|                 |                       |                                             |                             |                                                                                          |       |                       |                         |                     | WM: ↑ bilat HG and intraparietal areas |
| Li J., 2012     | WB                    | VBM (GM, WM), CT                            | 16 D                         | 14.56 ± 2.10 (10-18)                                                                   | 16/16 | RH                    | > 90 db                                  | preL, preS | yes                       | drug toxicity (9), GM: ↓ CT WB, L preC, R postC, L SFG and L fus gyrus |
|                 |                       |                                             |                             |                                                                                          |       |                       |                         |                     | WM: ↓ L middle front gyrus and R inf occ gyrus |
| Li W., 2013      | WB                    | VBM (GM, WM), CT                            | 16 D                         | 14.56 ± 2.10 (10-18)                                                                   | 16/16 | RH                    | > 90 db                                  | preL, preS | yes                       | drug toxicity (9), GM: ↑ Rw as of density in cerebellum, ↑ lw as of CT in post Cing, ↑ lw as of CT in gyri rectus (↑ L and ↓ R), ↑ Rw as of CT in precuneus, ↑ Rw as of CT of MFG (↓ L and ↑ R), ↑ Rw as of CT MDG |
|                 |                       |                                             |                             |                                                                                          |       |                       |                         |                     | WM: no diff |
| Li W., 2015      | 14 ROI within temp, front, parietal, occ gyr | manual volumetry                | 16 D                         | 14.56 ± 2.10 (10-18)                                                                   | 16/16 | RH                    | > 90 db                                  | preL, preS | yes                       | drug toxicity (9), GM: ↑ Rw as of density in cerebellum, ↑ lw as of CT in post Cing, ↑ lw as of CT in gyri rectus (↑ L and ↓ R), ↑ Rw as of CT of MFG (↓ L and ↑ R), ↑ Rw as of CT MDG |
| Meyer M., 2007   | post Sylvian fissure, WB | manual curvature, morphometry (GM, WM)     | 6 D                          | 23.5 ± 19.43                                                                          | 4/8   | RH                    | NS                                     | preL, preS | NS                       | NS       | sleeper slope of the post Sylvian fissure |
| Study | Authors | Year | Age | Gender | Follow-Up | VBM | n | RH | Results |
|-------|---------|------|-----|--------|-----------|-----|---|----|---------|
| Olulade O, 2014 | * | | | | | | | | |
| Penhune V, 2003 | HG, PT, WB | manual volumetry, VBM (GM, WM) | 15 D | 29 | RH | 10/12 | > 90 dB | pres, SL | NS |
| Qi R, 2019 | WB | VBM (GM) | 35 D | 39.72 ± 1.81 | RH | 23/35 | > 90 dB (33), > 40 dB (2) | pres, NS | GM: ↓ R fus and R MOG |
| Smith K, 2011 | HG, WB | manual volumetry, VBM (GM, WM) | 15 D | 9.36 ± 3.14 | RH | 9/14 | > 90 dB | pres, SL | NS |
| Shibata D, 2007 | WB | VBM (GM, WM) | 15 D | 8.41 ± 2.67 | RH | 39/65 | > 90 dB | preL, SL | NS |
| Shiohama T, 2019 | WB | region and surface-based analysis | 15 D | 6.7 ± 5.2 | RH | 16/32 | > 56 dB | pres, yes (convention al or CI) | NS |
| Smittenaar C, 2016 | CT | V1 (primary visual cortex), defined by fMRI | 15 D | 39 ± 10.2 | RH | 18/12 | Severe to profound | pres, SL | NS |
| | | | 15 HS | 38 ± 10.2 | RH | 18/12 | Severe to profound | pres, SL | NS |

**Note:** * and °, same population in different papers; /, not investigated; WB, Whole Brain; VBM, Voxel Based Morphometry; GM, Grey Matter; WM, White Matter; CT, Cortical Thickness; D, Deaf; H, Hearing; PreL, Prelingual; PostL, Postlingual; NS, Not Specified; HG, Heschl's gyrus; PT, Planum Temporale; MTG, Middle Temporal Gyrus; ITG, Inferior Temporal Gyrus; SFG, Superior Frontal Gyrus; MFG, Middle Frontal Gyrus; IFG, Inferior Frontal Gyrus; SOG, Superior Occipital Gyrus; MOG, Middle Occipital Gyrus; Fus, Fusiform gyrus; Cing, Cingulate gyrus; prec, precentral gyrus; postC, postcentral gyrus; ↓, decrease (of volume when not specified); ↑, increase (of volume when not specified); R, Right; L, Left; CI, Cochlear Implant; Rw as, Rightward asymetry; Lw as, Leftward asymetry; CMV, Cytomegalovirus

**Table Note:** D SL user vs HS: ↑ R SFG, ↓ bilat STG, HG and insula, ↓ R claustrum, R fus, R infr pariet and L MTG, D vs H: ↑ bilat MTG, SFG and R MFG, ↓ L ant fus, lingual gyr, cerebellum, and R post Cing, SL vs English: ↑ R medial FG, MFG and IFG and precuneus, L MFG and Cing

**WM:** no diff

**WM:** D SL user vs HS: - bilat STG, HG, MTG, ITG, bilat fus and insula, ↓ L parahippocampal gyr; D vs H: ↓ L STG and HG; SL vs English: ↑ L preC and R IFG

**RH:** > 70 dB (15), > 50 dB (1)

**Note:** Manual curvature, VBM (GM, WM)

**GM:** D SL user vs HS: ↑ R SFG, ↓ bilat STG, HG and insula, ↓ R claustrum, R fus, R infr pariet and L MTG, D vs H: ↑ bilat MTG, SFG and R MFG, ↓ L ant fus, lingual gyr, cerebellum, and R post Cing, SL vs English: ↑ R medial FG, MFG and IFG and precuneus, L MFG and Cing

**GM:** ↓ L V1, V2 and V3a/V7 in late SL acquisition, ↑ L V1, V2, V3a/V7 in SL acquisition during infancy

**WM:** ↑ LV3a/V7 in late SL acquisition

**GM:** ↓ CT, surface areas and cortical volume of L MOG and L IDG

**WM:** no diff

**Note:** Manual volumetry, VBM (GM, WM)

**Note:** Manual curvature, VBM (GM, WM)