## Supplementary Table 1. Changes in grey matter volume (PRE to POST).

| Contrasts          | Regions                                                                 | MNI coordinates | T     | p (FWE-corrected) | Cluster Size (mm³) |
|--------------------|-------------------------------------------------------------------------|-----------------|-------|-------------------|--------------------|
| PRG > CTR          | R Superior Temporal Sulcus, R Middle, Inferior, Superior Temporal Gyrus, R Fusiform | 63 -35 -18      | 10.19 | <0.001            | 5907               |
|                    |                                                                         | 62 -24 -17      | 9.72  | <0.001            |                    |
|                    |                                                                         | 59 -44 -12      | 9.37  | <0.001            |                    |
|                    |                                                                         | 53 -3 -36       | 6.02  | 0.005             | 74                 |
|                    |                                                                         | 48 11 -38       | 5.67  | 0.019             | 26                 |
| CTR > PRG          | L Superior Temporal Sulcus, L Middle, Inferior, Superior Temporal Gyrus, L Fusiform | -51 -54 42      | 10.01 | <0.001            | 14984              |
|                    |                                                                         | -42 -68 38      | 9.28  | <0.001            |                    |
|                    |                                                                         | -60 -47 -9      | 8.90  | <0.001            |                    |
| LR Superior Medial Frontal Cortex, LR Inferior, Middle, Superior Frontal Gyrus, LR Orbitofrontal Cortex, LR Supplementary Motor Area, LR Precentral Gyrus, LR Anterior Cingulate Cortex, LR Middle Cingulate Cortex, LR Gyrus Rectus, LR Olfactory Gyrus, LR Temporal Pole, LR Insula | -26 27 59 | 9.91 | <0.001 | 51707 |
|                    |                                                                         | 18 50 42        | 9.58  | <0.001            |                    |
|                    |                                                                         | 12 62 33        | 9.39  | <0.001            |                    |
|                    |                                                                         | 39 27 -12       | 6.66  | <0.001            | 673                |
|                    |                                                                         | 33 42 -15       | 6.20  | 0.003             | 247                |
|                    |                                                                         | 24 48 -18       | 5.73  | 0.015             |                    |
|                    |                                                                         | 27 33 -17       | 5.68  | 0.018             |                    |
|                    |                                                                         | -56 14 -27      | 5.58  | 0.026             | 19                 |
| R Temporo-Parietal Junction, R Angular Gyrus, R Inferior, Superior Parietal Lobule, R Supramarginal Gyrus, R Lingual Gyrus, R Fusiform, R Middle, Superior Occipital Gyrus, R Postcentral Gyrus | 39 -68 39 | 9.30 | <0.001 | 4562 |
|                    |                                                                         | 48 -60 33       | 9.30  | <0.001            |                    |
|                    |                                                                         | 41 -62 45       | 8.90  | <0.001            |                    |
|                    |                                                                         | 32 -48 -11      | 5.50  | 0.034             | 13                 |
| LR Precuneus, LR Posterior Cingulate Cortex, LR Middle Cingulate Cortex, LR Calcarine Sulcus, LR Cuneus | -8 -39 35 | 8.41 | <0.001 | 3982 |
|                    |                                                                         | -11 -54 15      | 7.78  | <0.001            |                    |
|                    |                                                                         | 5 -35 36        | 7.48  | <0.001            |                    |
|                    |                                                                         | 18 -48 3        | 6.02  | 0.005             | 47                 |
| L Hippocampus      |                                                                         | -27 -18 -18     | 6.37  | 0.001             | 58                 |
| R Hippocampus, R Parahippocampal Gyrus | 27 -18 -18 | 6.46 | 0.001 | 54 |
| L Caudate          |                                                                         | -8 8 9          | 6.84  | <0.001            | 219                |
| R Caudate          |                                                                         | 11 5 14         | 5.55  | 0.029             | 6                  |
| LR Posterior Cerebellum, Vermis | -33 -65 -27 | 6.53 | 0.001 | 229 |
|                    |                                                                         | 36 -60 -29      | 6.47  | 0.001             | 118                |
|                    |                                                                         | 3 -54 -53       | 6.35  | 0.002             | 325                |
|                    |                                                                         | -6 -56 -50      | 6.13  | 0.003             |                    |
|                    |                                                                         | 38 -63 -42      | 6.25  | 0.002             | 95                 |
|                    |                                                                         | 2 -47 -17       | 6.28  | 0.002             | 113                |

**Note.** Results of the main model comparing grey matter volume changes between the Pre and Post sessions in the women who were pregnant between sessions in comparison to the nulliparous control group. Statistics are extracted from two-sample t-tests performed within the framework of an SPM12 General Linear Model and are one-sided (as is standard in SPM). Results are reported at a statistical threshold of p<0.05 FWE-corrected. P-value at peak voxel (whole-brain FWE corrected) is reported. PRG = nulliparous women who were pregnant between sessions, CTR = nulliparous women who were not pregnant between sessions, L = left, R = right.
Supplementary Table 2. A further specification of the CTR>PRG findings.

| Contrasts | Regions                                                                 | MNI coordinates | T     | p (FWE-corrected) | Cluster Size (mm³) |
|-----------|-------------------------------------------------------------------------|------------------|-------|-------------------|--------------------|
| CTR       |                                                                        |                  |       |                   |                    |
| Increases |                                                                        |                  |       |                   |                    |
| PRG       | LR Superior, Middle, Inferior Frontal Gyrus, LR                         | -60 -46 -8       | 16.22 | <0.001            | 3354972            |
| Decreases | Superior Medial Frontal Cortex, LR Superior, LR                         | 60 -22 -16       | 15.69 | <0.001            |                    |
|           | Orbitofrontal Cortex, Middle, Inferior Temporal Gyrus, LR Superior      | -63 -30 -14      | 15.10 | <0.001            |                    |
|           | Temporal Pole, LR Precuneus, LR Cuneus, LR                             |                  |       |                   |                    |
|           | Superior, Middle, Inferior Superior Temporal Sulcus, LR                |                  |       |                   |                    |
|           | Anterior, Middle, Posterior Cingulate Cortex, LR                        |                  |       |                   |                    |
|           | Precentral Gyrus, LR Fusiform, LR Angular Gyrus, LR Supramarginal Gyrus |                  |       |                   |                    |
|           | LR Temporo-Parietal Junction, LR Insula, LR Anterior, Posterior         |                  |       |                   |                    |
|           | Cerebellum, Superior, Middle, Inferior Occipital Gyrus, LR Lingual Gyrus |                  |       |                   |                    |
|           | LR Caudate, LR Precentral Gyrus, LR Putamen, LR Calcarine Sulcus, LR Gyrus Rectus, LR Hippocampus, LR Parahippocampal Gyrus, LR Thalamus, LR Postcentral Gyrus, Vermis, LR Olfactory Gyrus, LR Pallidum, LR Paracentral Gyrus | -4 -21 81        | 5.55  | 0.029             | 24                 |
|           | L Paracentral Lobule                                                   |                  |       |                   |                    |
|           | R Postcentral Gyrus                                                    | 16 -32 81        | 5.00  | 0.041             | 5                  |

Note. Following up on the significant group differences obtained in the PRG>CTR contrast reported in Supplementary Table 1, this table reports the results for contrasts representing the increases in the CTR group and decreases in the PRG group between the pre-conception and post-pregnancy sessions, allowing us to examine whether the results observed in the CTR>PRG contrast reflect grey matter volume increases in the CTR group or grey matter volume decreases in the PRG group. Statistics are extracted from one-sample t-tests performed within the framework of an SPM12 General Linear Model and are one-sided (as is standard in SPM). Results are reported at a statistical threshold of p<0.05 FWE-corrected. P-value at peak voxel (whole-brain FWE corrected) is reported. PRG = nulliparous women who were pregnant between sessions, CTR = nulliparous women who were not pregnant between sessions, L = left, R = right.
Supplementary Figure 1. Effect sizes (Cohen’s d) for the PRE to POST changes in GM volume. Effect sizes are presented for the changes between sessions in the women who were pregnant between sessions in comparison to the control women. All depicted effect sizes correspond to large effect sizes (Cohen’s d>0.8). Effect sizes were extracted using the VBM8 toolbox (http://www.neuro.uni-jena.de/vbm/) and plotted in mricron (https://www.nitrc.org/projects/mricron). N pregnant group = 40, N control group = 40.
Supplementary Table 3. Changes in grey matter volume (PRE to POST) excluding the participants with the long time interval between sessions.

| Contrasts   | Regions                                                                 | MNI coordinates | T         | p (FWE-corrected) | Cluster Size (mm³) |
|-------------|--------------------------------------------------------------------------|------------------|-----------|-------------------|-------------------|
| PRG > CTR   | L Superior, Middle, Inferior Temporal Gyrus, L Superior Temporal Sulcus, L Temporal Pole, L Fusiform, L Angular Gyrus, L Supramarginal Gyrus, L Temporo-Parietal Junction, L Superior, Inferior Parietal Lobule, L Lingual Gyrus, L Superior, Middle, Inferior Occipital Gyrus, L Parahippocampal Gyrus, L Putamen, L Postcentral Gyrus | -51 -54 42       | 9.91      | <0.001            | 14082             |
|             |                                                                          | -42 -68 38       | 8.92      | <0.001            |                   |
|             |                                                                          | -64 -30 -15      | 8.78      | <0.001            |                   |
|             |                                                                          | -26 -16 3        | 5.64      | 0.022             | 14                |
| CTR > PRG   | R Superior, Middle, Inferior Temporal Gyrus, R Superior Temporal Sulcus, R Fusiform | 63 -34 -18       | 9.84      | <0.001            | 5362              |
|             |                                                                          | 62 -24 -16       | 9.55      | <0.001            |                   |
|             |                                                                          | 54 -36 2         | 7.36      | <0.001            |                   |
|             |                                                                          | 52 -3 -36        | 5.75      | 0.015             | 30                |
| LR Superior Medial Frontal Cortex, LR Superior, Middle, Inferior Frontal Gyrus, LR Orbitofrontal Cortex, LR Supplementary Motor Area, LR Precentral Gyrus, LR Anterior, Middle Cingulate Cortex, LR Gyrus Rectors, LR Olfactory Gyrus, L Temporal Pole, LR Insula, LR Precentral Gyrus, LR Olfactory | -26 27 58        | 9.83      | <0.001            | 49081             |
|             |                                                                          | 20 50 40         | 9.23      | <0.001            |                   |
|             |                                                                          | 10 62 33         | 9.10      | <0.001            |                   |
|             |                                                                          | 40 27 -12        | 6.49      | 0.001             | 579               |
|             |                                                                          | 33 42 -16        | 5.86      | 0.010             | 65                |
|             |                                                                          | 24 48 -18        | 5.58      | 0.027             | 18                |
|             |                                                                          | 27 33 -16        | 5.46      | 0.041             | 2                 |
| R Angular Gyrus, R Supramarginal Gyrus, R Temporo-Parietal Junction, R Superior, Inferior Parietal Lobule, R Temporal Pole, R Middle, Superior Occipital Gyrus, R Postcentral Gyrus, R Superior, Inferior Temporal Gyrus, R Superior Temporal Sulcus, R Fusiform, R Lingual Gyrus | 48 -60 33        | 8.96      | <0.001            | 4325              |
|             |                                                                          | 39 -68 39        | 8.94      | <0.001            |                   |
|             |                                                                          | 40 -62 45        | 8.57      | <0.001            |                   |
|             |                                                                          | 48 10 -38        | 5.83      | 0.011             | 43                |
|             |                                                                          | 32 -48 -10       | 5.46      | 0.042             | 8                 |
| LR Precuneus, LR Posterior, Middle Cingulate Cortex, LR Calcarine Sulcus, LR Cuneus, R Lingual Gyrus | -8 -40 36        | 8.08      | <0.001            | 3726              |
|             |                                                                          | 4 -33 36         | 7.48      | <0.001            |                   |
|             |                                                                          | -10 -54 15       | 7.45      | <0.001            |                   |
|             |                                                                          | 18 -46 3         | 6.04      | 0.005             | 46                |
| R Hippocampus, R Parahippocampal Gyrus | 27 -20 -16        | 6.97      | <0.001            | 76                |
| L Hippocampus | -27 -18 -18        | 6.23      | 0.003             | 49                |
| R Caudate  | 10 4 14              | 5.79      | 0.013             | 19                |
| L Caudate  | -8 6 10              | 6.85      | <0.001            | 233               |
| LR Posterior Cerebellum, Vermis | 34 -60 -27        | 6.67      | <0.001            | 153               |
|             |                                                                          | 3 -54 -52        | 6.38      | 0.002             | 397               |
|             |                                                                          | -6 -56 -50       | 6.37      | 0.002             |                   |
|             |                                                                          | -32 -64 -27      | 6.48      | 0.001             | 220               |
|             |                                                                          | 2 -46 -16        | 6.30      | 0.002             | 121               |
|             |                                                                          | 38 -62 -42       | 6.12      | 0.004             | 68                |
|             |                                                                          | 22 -72 -27       | 5.41      | 0.050             | 1                 |

**Note.** Main model comparing grey matter volume changes between the Pre and Post sessions in the PRG and CTR groups, excluding the 3 women who initially did not participate in the Post session and therefore had a delayed time interval (>800 days) between the sessions (leaving a PRG sample size of N = 37 Statistics are extracted from two-sample t-tests performed within the framework of an SPM12 General Linear Model and are one-sided (as is standard in SPM). Results are reported at a statistical threshold of p<0.05 FWE-corrected. P-value at peak voxel (whole-brain FWE corrected) is reported. PRG = nulliparous women who were pregnant between sessions, CTR = nulliparous women who were not pregnant between sessions, L = left, R = right.
**Supplementary Table 4. Changes in grey matter volume (PRE to POST) corrected for medical history.**

| Contrasts     | Regions                                                                 | MNI coordinates | T     | p (FWE-corrected) | Cluster Size (mm³) |
|---------------|-------------------------------------------------------------------------|------------------|-------|-------------------|-------------------|
| PRG > CTR     |                                                                         |                  |       |                   |                   |
| CTR > PRG     | LR Superior, Middle, Inferior Frontal Gyrus, LR Medial Superior Frontal Cortex, LR Orbitofrontal Cortex, LR Gyrus Rectus, LR Insula, LR Supplementary Motor Area, LR Anterior, Middle Cingulate Cortex, LR Temporal Pole, LR Precentral Gyrus, LR Olfactory Gyrus | -24 30 57    | 10.95 | <0.001            | 60680             |
|               |                                                                         | 14 62 33        | 9.63  | <0.001            |                   |
|               |                                                                         | 18 50 42        | 9.60  | <0.001            |                   |
|               | L Superior, Middle, Inferior Temporal Gyrus, L Superior Temporal Sulcus, L Temporal Pole, L Fusiform, L Angular Gyrus, L Supramarginal Gyrus, L Temporo-Parietal Junction, L Lingual Gyrus, L Inferior, Middle, Superior Occipital Gyrus, L Parahippocampal Gyrus, | -62 -46 -8     | 9.89  | <0.001            | 14987             |
|               |                                                                         | -51 -54 44     | 9.52  | <0.001            |                   |
|               |                                                                         | -64 -30 -14    | 9.49  | <0.001            |                   |
|               |                                                                         | -54 15 -28     | 5.57  | 0.034             | 6                 |
|               | R Superior, Middle, Inferior Temporal Gyrus, R Superior Temporal Sulcus, R Fusiform, R Posterior Cerebelum, | 63 -34 -18     | 9.66  | <0.001            | 6100              |
|               |                                                                         | 58 -44 -12     | 9.22  | <0.001            |                   |
|               |                                                                         | 54 -36 2       | 7.80  | <0.001            |                   |
|               |                                                                         | 52 -3 -36      | 6.22  | 0.003             | 120               |
|               | R Angular Gyrus, R Supramarginal Gyrus, R Temporo-Parietal Junction, R Inferior Parietal Lobule, R Temporal Pole, R Superior, Inferior Temporal Gyrus, R Superior, Middle Occipital Gyrus, R Postcentral Gyrus, R Fusiform, R Lingual Gyrus, R Parahippocampal Gyrus, | 48 -60 32      | 9.53  | <0.001            | 4133              |
|               |                                                                         | 39 -68 39      | 9.12  | <0.001            |                   |
|               |                                                                         | 44 -51 46      | 8.03  | <0.001            |                   |
|               |                                                                         | 48 12 -39      | 5.56  | 0.035             | 9                 |
|               |                                                                         | 28 -46 -6      | 6.66  | 0.001             | 141               |
|               | LR Precuneus, LR Cuneus, LR Middle, Posterior Cingulate Cortex, LR Calcarine Sulcus | -6 -39 36      | 8.73  | <0.001            | 4103              |
|               |                                                                         | 8 -40 34       | 8.04  | <0.001            |                   |
|               |                                                                         | -10 -52 15     | 7.51  | <0.001            |                   |
|               |                                                                         | 18 -48 4       | 5.61  | 0.030             | 8                 |
| L Caudate     |                                                                         | -8 8 9         | 6.80  | <0.001            | 220               |
| R Hippocampus |                                                                         | 27 -18 -18     | 5.88  | <0.012            | 16                |
| L Hippocampus |                                                                         | -26 -20 -16    | 6.50  | 0.001             | 48                |
| LR Anterior, Posterior Cerebellum, Vermis |                                                                         | 36 -62 -27     | 6.49  | <0.001            | 179               |
|               |                                                                         | 24 -75 -26     | 5.55  | 0.037             |                   |
|               |                                                                         | -30 -64 -27    | 6.45  | 0.001             | 236               |
|               |                                                                         | 38 -63 -42     | 6.45  | 0.002             | 97                |
|               |                                                                         | 3 -52 -52      | 6.36  | 0.002             | 327               |
|               |                                                                         | -6 -57 -51     | 6.27  | 0.003             |                   |
|               |                                                                         | 0 -46 -16      | 6.24  | 0.003             | 101               |

*Note. Main model comparing grey matter volume changes between the Pre and Post sessions in the PRG and CTR group corrected for the participants’ medical history. Statistics are extracted from two-sample t-tests performed within the framework of an SPM12 General Linear Model and are one-sided (as is standard in SPM). Results are reported at a statistical threshold of p<0.05 FWE-corrected. P-value at peak voxel (whole-brain FWE corrected) is reported. PRG = nulliparous women who were pregnant between sessions, CTR = nulliparous women who were not pregnant between sessions, L = left, R = right.*
Supplementary Table 5. Changes in grey matter volume (PRE to POST) corrected for fertility treatment or twins.

| Contrasts | Regions                                                                 | MNI coordinates | T     | p (FWE-corrected) | Cluster Size (mm³) |
|-----------|-------------------------------------------------------------------------|-----------------|-------|-------------------|-------------------|
| PRG > CTR |                                                                         |                 |       |                   |                   |
| CTR > PRG | R Superior, Middle, Inferior Temporal Gyrus, R Superior Temporal Sulcus| 63 -35 -18      | 9.77  | <0.001            | 4978              |
|           |                                                                         | 60 -42 -14      | 9.07  | <0.001            |                   |
|           |                                                                         | 54 -17 -12      | 7.14  | <0.001            |                   |
|           | L Superior, Middle, Inferior Temporal Gyrus, L Superior Temporal Sulcus| -52 -53 44     | 8.76  | <0.001            | 10824             |
|           | L Superior Temporal Sulcus, L Fusiform, L Angular                       |                 |       |                   |                   |
|           | L Gyrus, L Temporo-Parietal Junction, L Temporal                        |                 |       |                   |                   |
|           | L Pole, L Superior, Inferior Parietal Lobule, L                         |                 |       |                   |                   |
|           | L Superior, Middle, Inferior Occipital Gyrus, L Lingual Gyrus, L Parahippocampal Gyrus |                 |       |                   |                   |
|           |                                                                         |                 |       |                   |                   |
|           | LR Superior Medial Frontal Cortex, LR Superior,                         |                 |       |                   |                   |
|           | Middle, Inferior Frontal Gyrus, LR Orbitofrontal                       |                 |       |                   |                   |
|           | Cortex, LR Supplementary Motor Area, LR                                 |                 |       |                   |                   |
|           | Precentral Gyrus, LR Anterior, Middle Cingulate                         |                 |       |                   |                   |
|           | Cortex, LR Gyrus Rectus, LR Olfactory Gyrus, LR Insula, L Temporal Pole|                 |       |                   |                   |
|           |                                                                         |                 |       |                   |                   |
|           | R Superior, Middle, Inferior Temporal Gyrus, R                         | 48 -62 32       | 8.55  | <0.001            | 3054              |
|           | Superior Temporal Sulcus, R Angular Gyrus, R                           | 41 -66 39       | 7.92  | <0.001            |                   |
|           | Supramarginal Gyrus, R Temporo-Parietal                                 | 44 -53 48       | 7.51  | <0.001            |                   |
|           | Junction, R Superior, Inferior Parietal Lobule, R                      | 53 -2 -38       | 5.42  | 0.035             | 9                 |
|           | Superior, Middle Occipital Gyrus, R Temporal Pole                       | 48 -11 -38      | 5.34  | 0.048             | 1                 |
|           |                                                                         |                 |       |                   |                   |
|           | LR Precuneus, LR Middle, Posterior Cingulate, LR                       | -8 -41 35       | 8.05  | <0.001            | 2190              |
|           | Calcarine Sulcus, LR Cuneus, R Lingual Gyrus                           | 6 -30 34        | 7.08  | <0.001            |                   |
|           |                                                                         | 12 -54 21       | 6.35  | 0.001             |                   |
|           |                                                                         | -11 -54 15      | 6.69  | <0.001            | 232               |
|           |                                                                         | 18 -48 3        | 6.09  | 0.003             | 38                |
|           |                                                                         |                 |       |                   |                   |
|           | L Hippocampus                                                           | -27 -17 -18     | 5.90  | 0.006             | 31                |
|           |                                                                         |                 |       |                   |                   |
|           | R Hippocampus, R Parahippocampal Gyrus, R Fusiform                      | 27 -20 -18      | 6.54  | <0.001            | 79                |
|           |                                                                         | 30 -29 -28      | 5.43  | 0.014             |                   |
|           |                                                                         |                 |       |                   |                   |
|           | L Caudate                                                               | -9 6 12         | 6.34  | 0.001             | 146               |
|           | R Caudate                                                               | 11 6 14         | 5.56  | 0.021             | 8                 |
|           |                                                                         |                 |       |                   |                   |
|           | R Anterior, Posterior Cerebellum                                        | 35 -62 -27      | 5.97  | 0.004             | 62                |
|           |                                                                         | 38 -63 -42      | 5.84  | 0.007             | 37                |
|           |                                                                         | 5 -54 -53       | 5.37  | 0.043             | 29                |
|           |                                                                         |                 |       |                   |                   |
|           | L Anterior, Posterior Cerebellum                                        | -35 -63 -29     | 6.16  | 0.00              | 133               |
|           |                                                                         | -8 -56 -50      | 5.50  | 0.026             | 16                |
**Note.** Main model comparing grey matter volume changes between the Pre and Post sessions in the PRG and CTR groups, excluding the women who underwent fertility treatment or delivered twins (leaving a PRG sample size of \( N = 36 \)). Statistics are extracted from two-sample t-tests performed within the framework of an SPM12 General Linear Model and are one-sided (as is standard in SPM). Results are reported at a statistical threshold of \( p < 0.05 \) FWE-corrected. P-value at peak voxel (whole-brain FWE corrected) is reported. PRG = nulliparous women who were pregnant between sessions, CTR = nulliparous women who were not pregnant between sessions, L = left, R = right.

**Supplementary Table 6. Changes in grey matter volume (PRE to POST) excluding the participant who took part in the PRG group after completing the control trajectory.**

| Contrasts | Regions | MNI coordinates | \( T \) | \( p \) (FWE-corrected) | Cluster Size (mm\(^3\)) |
|-----------|---------|-----------------|-------|-------------------------|------------------------|
| PRG > CTR | -       |                 |       |                         |                        |
| CTR > PRG | R Middle, Inferior, Superior Temporal Gyrus, R Temporal Pole, R Superior Temporal Sulcus | 63 -36 -18 | 9.95  | <0.001                  | 5197                   |
|           | 62 -24 -16 | 9.43           | <0.001 |                         |                        |
|           | 54 -16 -12 | 7.51           | <0.001 |                         |                        |
|           | 52 -3 -36  | 6.09           | 0.004  | 62                      |                        |
|           | 48 10 -38  | 5.52           | 0.035  | 6                       |                        |
|           | LR Superior Medial Frontal Cortex, LR Inferior, Middle, Superior Frontal Gyrus, LR Orbitofrontal Cortex, LR Supplementary Motor Area, LR Precentral Gyrus, LR Anterior, Middle Cingulate Cortex, LR Gyrus Rectus, LR Olfactory Gyrus, LR Temporal Pole, LR Insula | -26 27 58 | 9.77  | <0.001                  | 49194                  |
|           | 20 50 42 | 9.63           | <0.001 |                         |                        |
|           | 3 60 34 | 9.15           | <0.001 |                         |                        |
|           | 39 27 58 | 6.39           | 0.001  | 496                     |                        |
|           | 33 42 58 | 6.00           | 0.006  | 129                     |                        |
|           | 24 48 20 | 5.67           | 0.021  |                         |                        |
|           | 27 33 16 | 5.53           | 0.034  | 6                       |                        |
|           | L Superior, Middle, Inferior Temporal Gyrus, L Superior Temporal Sulcus, L Angular Gyrus, L Temporo-Parietal Junction, L Superior, Middle, Inferior Occipital Gyrus, L Fusiform, L Supramarginal Gyrus, L Superior, Inferior Parietal Lobule, L Lingual Gyrus, L Parahippocampal Gyrus, L Postcentral Gyrus | -51 -54 42 | 9.72  | <0.001                  | 13535                  |
|           | -42 -68 38 | 8.97           | <0.001 |                         |                        |
|           | -60 -46 9  | 8.61           | <0.001 |                         |                        |
|           | R Angular Gyrus, R Temporo-Parietal Junction, R Superior, Inferior Parietal Lobule, R Superior Temporal Sulcus, R Supramarginal Gyrus, R Superior, Middle Occipital Gyrus, R Superior, Middle, Inferior Temporal Gyrus, R Postcentral Gyrus, R Fusiform | 48 -60 33 | 9.03  | <0.001                  | 4371                   |
|           | 39 -68 39 | 9.03           | <0.001 |                         |                        |
|           | 40 -62 45 | 8.72           | <0.001 |                         |                        |
|           | 40 -26 -27 | 5.88           | 0.010  | 155                     |                        |
|           | 44 -33 -21 | 5.69           | 0.019  |                         |                        |
|           | LR Precuneus, LR Middle, Posterior Cingulate Cortex, LR Calcarine Sulcus, LR Cuneus | -8 -39 34 | 8.22  | <0.001                  | 3405                   |
|           | -12 -54 15 | 7.82           | <0.001 |                         |                        |
|           | 6 -38 36  | 7.30           | <0.001 |                         |                        |
|           | 18 -48 3  | 5.85           | 0.011  | 28                      |                        |
|           | L Caudate | -8 8 9 | 6.83 | <0.001 | 193 |
|           | R Hippocampus, R Parahippocampal Gyrus | 27 -20 -18 | 6.34  | 0.002 | 44  |
|           | L Hippocampus | -27 -18 -18 | 6.18  | 0.003 | 41  |
|           | LR Anterior, Posterior Cerebellum, Vermis | 36 -60 -28 | 6.39  | 0.001 | 108  |
|           | -33 -65 -27 | 6.27           | 0.002  | 146                     |                         |
|           | 2 -46 -16  | 6.22           | 0.003  | 97                      |                         |
|           | 3 -54 -52  | 6.12           | 0.004  | 236                     |                         |
|           | -6 -56 -50 | 5.96           | 0.007  |                         |                        |
|           | 38 -63 -42 | 6.09           | 0.005  | 71                      |                         |
Note. Main model comparing grey matter volume changes between the Pre and Post sessions in the PRG and CTR groups, excluding the woman who participated in the PRG group after completing the study trajectory in the CTR group (leaving a PRG sample size of N = 39). Statistics are extracted from two-sample t-tests performed within the framework of an SPM12 General Linear Model and are one-sided (as is standard in SPM). Results are reported at a statistical threshold of p<0.05 FWE-corrected. P-value at peak voxel (whole-brain FWE corrected) is reported. PRG = nulliparous women who were pregnant between sessions, CTR = nulliparous women who were not pregnant between sessions, L = left, R = right.

Supplementary Table 7. Total brain volumes Pre and Post sessions.

|          | PRG (Mean ± SD) | CTR (Mean ± SD) | Between-Group Differences |
|----------|-----------------|-----------------|---------------------------|
|          | GM (L)          | POST            | t= -1.180, p = 0.242      |
| PRE      | 0.731 ± 0.060   | 0.741 ± 0.066   |                           |
| POST     | 0.714 ± 0.059   | 0.735 ± 0.067   |                           |
|          | WM (L)          | POST            | t= -0.355, p = 0.723      |
| PRE      | 0.388 ± 0.037   | 0.391 ± 0.033   |                           |
| POST     | 0.389 ± 0.037   | 0.392 ± 0.036   |                           |
|          | TBV (L)         | POST            | t= -0.609, p = 0.544      |
| PRE      | 1.119 ± 0.089   | 1.131 ± 0.093   |                           |
| POST     | 1.103 ± 0.089   | 1.127 ± 0.097   |                           |

Note. Total grey matter, white matter and total brain volume of the two groups at the Pre and Post sessions. Between-group differences were analyzed using two-sided two-sample t-tests. Repeated Measures General Linear Models comparing the change in total tissue volumes across sessions between the groups were also performed, which revealed significant group*session interaction effects for the changes in grey matter (F=24.39, p<0.001) and total brain volume (F=22.67, p<0.001) but not for white matter (F=0.221, p=0.640). Pre = pre-pregnancy session; Post = post-pregnancy session; L = liter; GM = grey matter; WM = white matter; TBV = total brain volume.

Supplementary Table 8. Total brain volumes late postpartum period (Post+1y).

|          | Late Postpartum (Mean ± SD) |
|----------|-----------------------------|
| GM (L)   | 0.712 ± 0.056               |
| WM (L)   | 0.384 ± 0.038               |
| TBV (L)  | 1.096 ± 0.087               |

Note. Values of total grey matter, white matter and total brain volume for the late postpartum sessions in the women who became pregnant during this study are provided in this table. L = liter; GM = grey matter; WM = white matter; TBV = total brain volume.
Supplementary Table 9. Changes in grey matter volume (PRE to POST) corrected for TBV change.

| Contrasts | Regions                                                                 | MNI coordinates | T (FWE-corrected) | p-value | Cluster Size (mm³) |
|-----------|-------------------------------------------------------------------------|-----------------|-------------------|---------|-------------------|
| PRG > CTR | L Angular Gyrus, L Supramarginal Gyrus, L Temporo-Parietal Junction, L Inferior Parietal Lobule, L Middle Occipital Gyrus, L Middle, Inferior Temporal Gyrus, L Superior Temporal Sulcus, L Middle, Posterior Cingulate Cortex, L Precuneus | [-51 -52 44]    | 8.28              | <0.001  | 1760              |
|           |                                                                         | [-42 -68 38]    | 7.30              | <0.001  |                   |
|           |                                                                         | [-48 -56 24]    | 6.51              | 0.001   |                   |
|           |                                                                         | [-66 -30 -15]   | 7.11              | <0.001  | 1241              |
|           |                                                                         | [-60 -46 -9]    | 6.87              | <0.001  |                   |
|           |                                                                         | [-63 -40 -18]   | 6.75              | <0.001  |                   |
|           |                                                                         | [-8 -40 36]     | 6.93              | <0.001  | 109               |
|           |                                                                         | [-10 -54 15]    | 5.79              | 0.014   | 14                |
| CTR > PRG | R Inferior, Middle Temporal Gyrus, R Superior Temporal Sulcus, R Angular Gyrus, R Supramarginal Gyrus, R Temporo-Parietal Junction, R Superior, Inferior Parietal Lobule, R Middle, Superior Occipital Gyrus, R Middle Cingulate Cortex | [63 -34 -18]    | 8.25              | <0.001  | 1361              |
|           |                                                                         | [62 -24 -16]    | 7.74              | <0.001  |                   |
|           |                                                                         | [60 -42 -14]    | 7.50              | <0.001  |                   |
|           |                                                                         | [48 -60 33]     | 8.04              | <0.001  | 952               |
|           |                                                                         | [40 -66 39]     | 7.36              | <0.001  |                   |
|           |                                                                         | [44 -51 46]     | 6.64              | 0.001   |                   |
|           |                                                                         | [8 -39 36]      | 5.76              | 0.016   | 27                |
|           |                                                                         | [54 -36 2]      | 5.53              | 0.035   | 2                 |
| LR Superior, Middle, Inferior Frontal Gyrus, LR Superior Medial Frontal Cortex, L Precentral Gyrus, L Supplementary Motor Area, LR Gyrus Rectus, LR Orbitofrontal Cortex, L Temporal Pole | [-26 27 58]     | 7.83              | <0.001  | 7452              |
|           |                                                                         | [18 50 42]      | 7.75              | <0.001  |                   |
|           |                                                                         | [12 60 33]      | 7.45              | <0.001  |                   |
|           |                                                                         | [-50 9 20]      | 6.47              | 0.001   | 73                |
|           |                                                                         | [2 40 -24]      | 6.24              | 0.003   | 199               |
|           |                                                                         | [-8 34 -18]     | 5.64              | 0.024   |                   |
|           |                                                                         | [-4 27 -16]     | 5.53              | 0.035   |                   |
|           |                                                                         | [2 63 -10]      | 5.59              | 0.003   | 161               |
|           |                                                                         | [-38 21 -15]    | 6.16              | 0.004   | 63                |
|           |                                                                         | [-32 60 4]      | 6.06              | 0.005   | 83                |
|           |                                                                         | [-30 54 24]     | 5.97              | 0.007   | 197               |
|           |                                                                         | [6 72 -4]       | 5.60              | 0.028   | 9                 |
|           |                                                                         | [16 68 15]      | 5.53              | 0.036   | 6                 |
|           |                                                                         | [-46 18 8]      | 5.51              | 0.038   | 4                 |
| L Caudate |                                                                         | [-6 6 9]        | 5.76              | 0.016   | 18                |

Note. Main model comparing grey matter volume changes between the Pre and Post sessions in the PRG and CTR groups corrected for changes in total brain volume. Statistics are extracted from two-sample t-tests performed within the framework of an SPM12 General Linear Model and are one-sided (as is standard in SPM). Results are reported at a statistical threshold of p<0.05 FWE-corrected. P-value at peak voxel (whole-brain FWE corrected) is reported. PRG = nulliparous women who were pregnant between sessions, CTR = nulliparous women who were not pregnant between sessions, L = left, R = right.
Supplementary Table 10. Quantification of overlap between GM volume changes of pregnancy (PRE to POST) and the brain’s cognitive networks

| Map1         | Volume map (mm³) | Observed overlap (mm³) | Observed overlap (%Map1) | Observed overlap (%ΔPRG) | Expected overlap (mm³) | Observed / expected overlap |
|--------------|------------------|------------------------|--------------------------|--------------------------|------------------------|-----------------------------|
| Comp 1       | 229105           | 11084                  | 3.62                     | 4.84                     | 71294                  | 0.16                        |
| Comp 2       | 221549           | 12342                  | 4.03                     | 5.57                     | 68943                  | 0.18                        |
| Comp 3       | 183971           | 37736                  | 12.31                    | 20.51                    | 57249                  | 0.66                        |
| Comp 4       | 235852           | 14070                  | 4.59                     | 5.97                     | 73394                  | 0.19                        |
| Comp 5       | 194876           | 48614                  | 15.86                    | 24.95                    | 60643                  | 0.80                        |
| Comp 6       | 194214           | 25252                  | 8.24                     | 13.00                    | 60437                  | 0.42                        |
| Comp 7       | 206442           | 14708                  | 4.80                     | 7.12                     | 64242                  | 0.23                        |
| Comp 8       | 218987           | 57996                  | 18.92                    | 26.48                    | 68146                  | 0.85                        |
| Comp 9       | 217411           | 73683                  | 24.03                    | 33.89                    | 67655                  | 1.09                        |
| Comp 10      | 180326           | 65526                  | 21.37                    | 36.34                    | 56115                  | 1.17                        |
| Comp 11      | 194241           | 36288                  | 11.84                    | 18.68                    | 60445                  | 0.60                        |
| Comp 12      | 184910           | 30736                  | 10.03                    | 16.62                    | 57541                  | 0.53                        |

Note. The overlap of the changes in GM volume across pregnancy were quantified with the cognitive networks of the large-scale meta-analysis of cerebral functional network organization by Yeo et al. The tasks recruited by the cognitive components of Yeo et al. are depicted in an interactive map (https://surfer.nmr.mgh.harvard.edu/fswiki/BrainmapOntology_Yeo2015). The overlap of our results with these functional networks was extracted by computing the intersection between each of these maps and the GM volume changes of pregnancy (column ‘Observed overlap’). The percentages of each of the maps represented by the overlap were subsequently determined and reported in percentage of the functional map (column ‘Observed overlap (%Map1)’) and in percentage of the map of GM volume changes of pregnancy (column ‘Observed overlap (%ΔPRG)’). The expected overlap based on a random distribution across the brain was determined by multiplying the percentages of the brain’s total GM represented by each of the 2 maps. The percentage of expected overlap was then multiplied by total GM (column ‘Expected overlap’), and the expected overlap was divided by the observed overlap (column ‘Observed / expected overlap’). Comp= component, ΔPRG = changes in GM volume across pregnancy.
Supplementary Figure 2. Spatial overlap quantification analyses. a) Surface maps displaying the observed changes in grey matter volume in women. b) The networks of intrinsic connectivity as defined by Yeo et al.\(^2\) in ‘The organization of the human cerebral cortex estimated by intrinsic functional connectivity’ published in 2011 in the Journal of Neurophysiology (J. Neurophysiology 106, 1125). The red color represents the Default Mode Network. Other colors represent the visual network (purple), the somatosensory network (blue), the dorsal attention network (green), the ventral attention network (violet), the limbic network (cream) and the frontoparietal network (orange).

Supplementary Table 11: Quantification of overlap between GM volume changes of pregnancy (PRE to POST) and networks of intrinsic functional connectivity by Yeo et al.

| Map1 | Volume map (mm\(^3\)) | Observed overlap (mm\(^3\)) | Observed overlap (%Map1) | Observed overlap (%\(\delta\)PRG) | Expected overlap (mm\(^3\)) | Observed / expected overlap |
|------|------------------------|-----------------------------|--------------------------|-----------------------------------|-------------------------------|-----------------------------|
| Comp 1 | 178136 | 3368 | 1.10 | 1.89 | 55433 | 0.06 |
| Comp 2 | 155939 | 1286 | 0.42 | 0.82 | 48526 | 0.03 |
| Comp 3 | 123073 | 12396 | 4.04 | 10.07 | 38298 | 0.32 |
| Comp 4 | 109637 | 11570 | 3.77 | 10.55 | 34117 | 0.34 |
| Comp 5 | 92316 | 9713 | 3.17 | 10.52 | 28728 | 0.34 |
| Comp 6 | 155509 | 75799 | 24.72 | 48.74 | 48392 | 1.57 |
| Comp 7 | 241012 | 133009 | 43.39 | 55.19 | 74999 | 1.77 |

Note. The overlap of the changes in GM volume across pregnancy were quantified with the networks of intrinsic functional connectivity defined by Yeo et al.\(^2\). The overlap of our results with these functional networks was extracted by computing the intersection between each of these maps and the GM volume changes of pregnancy (column ‘Observed overlap’). The percentages of each of the maps represented by the overlap were subsequently determined and reported in percentage of the functional map (column ‘Observed overlap (%Map1)’) and in percentage of the map of GM volume changes of pregnancy (column ‘Observed overlap (%\(\delta\)PRG)’). The expected overlap based on a random distribution across the brain was determined by multiplying the percentages of the brain’s total GM represented by each of the 2 maps. The percentage of expected overlap was then multiplied by total GM (column ‘Expected overlap’), and the expected overlap was divided by the observed overlap (column ‘Observed / Expected overlap’). Comp= component, Comp 1 = Visual Network, Comp 2 = Somatosensory Network, Comp 3 = Dorsal Attention Network, Comp 4 = Ventral Attention Network, Comp 5 = Limbic Network, Comp 6 = Frontoparietal Network, Comp 7 = Default Mode Network, \(\delta\)PRG = changes in GM volume across pregnancy.
**Supplementary Table 12:** Quantification of overlap between GM volume changes of pregnancy (PRE to POST) and networks of intrinsic functional connectivity by Smith et al.

| Comp  | Volume map (mm\(^3\)) | Observed overlap (mm\(^3\)) | Observed overlap (%Map1) | Observed overlap (%δPRG) | Expected overlap (mm\(^3\)) | Observed / expected overlap |
|-------|------------------------|-----------------------------|--------------------------|--------------------------|-------------------------------|-----------------------------|
| 1     | 1027127                | 121622                      | 11.84                    | 9.12                     | 319627                        | 0.38                        |
| 2     | 1014319                | 134963                      | 13.31                    | 10.22                    | 315641                        | 0.43                        |
| 3     | 1089929                | 138929                      | 12.75                    | 9.95                     | 339170                        | 0.41                        |
| 4     | 1048353                | 175004                      | 16.69                    | 12.92                    | 326232                        | 0.54                        |
| 5     | 990070                 | 129131                      | 13.04                    | 9.96                     | 308095                        | 0.42                        |
| 6     | 1093109                | 160043                      | 14.64                    | 11.43                    | 340159                        | 0.47                        |
| 7     | 1079939                | 143535                      | 13.29                    | 10.35                    | 336061                        | 0.43                        |
| 8     | 1148361                | 179921                      | 15.67                    | 12.37                    | 357353                        | 0.50                        |
| 9     | 1139896                | 186276                      | 16.34                    | 12.88                    | 354719                        | 0.53                        |
| 10    | 1098363                | 190279                      | 17.32                    | 13.54                    | 341795                        | 0.56                        |

Note. The overlap of the changes in GM volume across pregnancy were quantified with the networks of intrinsic functional connectivity defined by Smith et al. The overlap of our results with these functional networks was extracted by computing the intersection between each of these maps and the GM volume changes of pregnancy (column ‘Observed overlap’). The percentages of each of the maps represented by the overlap were subsequently determined and reported in percentage of the functional map (column ‘Observed overlap (%Map1)’) and in percentage of the map of GM volume changes of pregnancy (column ‘Observed overlap (%δPRG)’). The expected overlap based on a random distribution across the brain was determined by multiplying the percentages of the brain’s total GM represented by each of the 2 maps. The percentage of expected overlap was then multiplied by total GM (column ‘Expected overlap’), and the expected overlap was divided by the observed overlap (column ‘Observed / expected overlap’).

### Supplementary Table 13. Changes in default mode network connectivity (PRE to POST).

| Contrasts | Regions                | MNI coordinates | T     | P (FWE-corrected) | Cluster Size (mm\(^3\)) |
|-----------|------------------------|-----------------|-------|-------------------|--------------------------|
| (PRG post>pre) > (CTR post>pre) | L cuneus, R cuneus | 6 -84 18 | 4.69 | 0.019             | 135                      |
| (PRG pre>post) > (CTR pre>post) | - | | | | |

Note. Results of interaction contrasts between group (PRG vs CTR) and session (PRE and POST) for the default mode network component. The other networks rendered no significant results. PRG = women who were pregnant between sessions, CTR = women who were not pregnant between sessions. Results are reported at a statistical threshold of P<0.05 FWE-corrected (P value at peak voxel).
Supplementary Table 14. Changes in within-network connectivity (PRE to POST).

| Contrasts | Direction | Regions | MNI coordinates $x$ $y$ $z$ | $T$ | $P$ (FWE-corrected) | Cluster Size (mm$^3$) |
|-----------|-----------|---------|----------------------------|-----|---------------------|----------------------|
| Visual 3  | increase  | R lingual | 18 -51 -6                  | 4.81 | 0.013               | 108                  |
| DMN       | increase  | L cuneus, R cuneus | 6 -84 18                 | 5.55 | 0.001*              | 297                  |
|           | decrease  | -        |                            |      |                     |                      |

**Note.** Changes across pregnancy in within-network connectivity in each of the networks. The other neural networks rendered no significant results. Results are extracted from one-sided t-tests performed in SPM12 and reported at a threshold of $P<0.05$ FWE-corrected (P value peak voxel). * also present in group*session interaction effect.

Supplementary Table 15. Baseline differences in DMN connectivity (PRE).

| Contrasts | Regions | MNI coordinates $x$ $y$ $z$ | $T$ | $P$ (FWE-corrected) | Cluster Size (mm$^3$) |
|-----------|---------|----------------------------|-----|---------------------|----------------------|
| PRG > CTR | L Precuneus | -3 -75 39                | 5.30 | 0.002               | 675                  |
|          | L Angular, L Inferior Parietal | -36 -72 45            | 4.55 | 0.029               | 52                   |
| CTR > PRG | -        |                            |      |                     |                      |

**Note.** Results of one-sided two-sample t-tests performed within the framework of the SPM12 General Linear Model testing for baseline differences in DMN connectivity. A region of interest (ROI) analysis involving the region of change observed in the main analysis indicated that there is no overlap between the observed cluster and the region undergoing changes across pregnancy.

Supplementary Table 16. Correlation between baseline (PRE) differences and DMN coherence changes across pregnancy.

| Measures | $R$ | $p$ |
|----------|-----|-----|
| Within PRG: Region 1 (-3 -75 39) | -.012 | .940 |
| Within PRG: Region 2 (-36 -72 45) | -.060 | .711 |
| In whole sample: Region 1 (-3 -75 39) | .040 | .730 |
| In whole sample: Region 2 (-36 -72 45) | .068 | .557 |

**Note.** Correlation results between the baseline signal values extracted from the clusters in the Supplementary Table above and the observed changes in default mode network coherence across pregnancy.

Supplementary Table 17. Changes in DMN coherence (PRE to POST), excluding the women with the delayed time interval.

| Contrasts | Regions | MNI coordinates $x$ $y$ $z$ | $T$ | $P$ (FWE-corrected) | Cluster Size (mm$^3$) |
|-----------|---------|----------------------------|-----|---------------------|----------------------|
| (PRG post>pre) > (CTR post>pre) | L cuneus, R cuneus | 6 -84 18                  | 4.85 | 0.012               | 162                  |
| (PRG pre>post) > (CTR pre>post) | -        |                            |      |                     |                      |
Note. Results of interaction contrasts between group (PRG vs CTR) and session (Pre and Post) for the DMN component within the framework of an SPM12 General Linear Model, excluding the women who initially did not participate in the Post session and therefore had a delayed time interval (>800 days) between the sessions (leaving a PRG sample size of N = 37). PRG = women who were pregnant between sessions, CTR = women who were not pregnant between sessions. Results are reported at a statistical threshold of p<0.05 FWE-corrected (P value at peak voxel).

Supplementary Table 18. Changes in DMN coherence (PRE to POST), excluding the participant who took part in the PRG group after completing the control trajectory.

| Contrasts | Regions          | MNI coordinates | T   | P (FWE-corrected) | Cluster Size (mm³) |
|-----------|------------------|-----------------|-----|-------------------|--------------------|
|           |                  |                 |     |                   |                    |
| (PRG post>pre) > (CTR post>pre) | L cuneus, R cuneus | x = 6, y = -84, z = 18 | 4.77 | 0.015             | 162                |
| (PRG pre>post) > (CTR pre>post) |                |                 |     |                   |                    |

Note. Results of interaction contrasts between group (PRG vs CTR) and session (Pre and Post) for the DMN component within the framework of an SPM12 General Linear Model, excluding the participant who participated first as a control subject and subsequently as a PRG participant (leaving a PRG sample size of N = 39). PRG = women who were pregnant between sessions, CTR = women who were not pregnant between sessions. Results are reported at a statistical threshold of p<0.05 FWE-corrected (P value at peak voxel).

Supplementary Table 19. Changes in DMN coherence (PRE to POST), excluding the participant who had twins.

| Contrasts | Regions          | MNI coordinates | T   | P (FWE-corrected) | Cluster Size (mm³) |
|-----------|------------------|-----------------|-----|-------------------|--------------------|
|           |                  |                 |     |                   |                    |
| (PRG post>pre) > (CTR post>pre) | L cuneus, R cuneus | x = 6, y = -81, z = 15 | 4.61 | 0.024             | 162                |
| (PRG pre>post) > (CTR pre>post) |                |                 |     |                   |                    |

Note. Results of interaction contrasts between group (PRG vs CTR) and session (Pre and Post) for the DMN component within the framework of an SPM12 General Linear Model, excluding the participant who had twins (leaving a PRG sample size of N = 39). PRG = women who were pregnant between sessions, CTR = women who were not pregnant between sessions. Results are reported at a statistical threshold of p<0.05 FWE-corrected (P value at peak voxel).

Supplementary Table 20. Changes in DMN coherence (PRE to POST), correcting for the participants’ medical history.

| Contrasts | Regions          | MNI coordinates | T   | P (FWE-corrected) | Cluster Size (mm³) |
|-----------|------------------|-----------------|-----|-------------------|--------------------|
|           |                  |                 |     |                   |                    |
| (PRG post>pre) > (CTR post>pre) | L cuneus, R cuneus | x = 6, y = -81, z = 15 | 4.32 | 0.064             |                    |
| (PRG pre>post) > (CTR pre>post) |                |                 |     |                   |                    |

Note. Results of interaction contrasts between group (PRG vs CTR) and session (Pre and Post) for the DMN component within the framework of an SPM12 General Linear Model, correcting for the participants’ medical history.
history. PRG= women who were pregnant between sessions, CTR = women who were not pregnant between sessions. Results are reported at a statistical threshold of p<0.05 FWE-corrected (P value at peak voxel).

Supplementary Table 21. Changes in DMN coherence (PRE to POST), excluding the participants who had undergone fertility treatment.

| Contrasts                          | Regions               | MNI coordinates | T    | P (FWE-corrected) | Cluster Size (mm$^3$) |
|------------------------------------|-----------------------|-----------------|------|-------------------|----------------------|
| (PRG post>pre) > (CTR post>pre)    | L cuneus, R cuneus    | 6, -84, 18      | 4.43 | 0.046             | 27                   |
| (PRG pre>post) > (CTR pre>post)    | -                     |                 |      |                   |                      |

Note. Results of interaction contrasts between group (PRG vs CTR) and session (Pre and Post) for the DMN component within the framework of an SPM12 General Linear Model, excluding the participants who had undergone fertility treatment (leaving a PRG sample size of N = 37). PRG= women who were pregnant between sessions, CTR = women who were not pregnant between sessions. Results are reported at a statistical threshold of p<0.05 FWE-corrected (P value at peak voxel).

Supplementary Table 22. Changes in DMN correlations across pregnancy (PRE to POST).

| DMN                        | F    | p    |
|----------------------------|------|------|
| Visual network 2           | .417 | .520 |
| Visual network 3           | 1.325| .218 |
| Sensorimotor network       | .111 | .740 |
| Visual network 1           | .242 | .624 |
| Perception-pain network    | .149 | .700 |
| Auditory network           | .137 | .712 |
| Cognition/language network | .496 | .484 |
| Cerebellum network         | .000 | .994 |
| Executive control network  | .011 | .919 |

Note. F-statistics and p-values of DMN correlations session (Pre vs Post) * subject group (primiparous vs control). Interaction effects were extracted from Repeated-Measures General Linear Models.
Supplementary Table 23. Changes in network correlations (PRE to POST) between all resting-state networks across pregnancy.

|                  | Visual 2 | Visual 3 | Sensorimotor | Visual 1 | DMN | Perception-pain | Auditory | Cognition-language | Cerebellum | Executive control |
|------------------|----------|----------|--------------|----------|-----|-----------------|----------|-------------------|------------|-------------------|
| Visual 2         |          |          |              |          |     |                 |          |                   |            |                   |
| Visual 3         | .865     |          | .854         | .971     | .218| .364            | .315     | .509              | .562       | .759              |
| Sensorimotor     | .880     | .854     |              | .709     | .740| .752            | .016     | .650              | .220       | .369              |
| Visual 1         | .031     | .971     | .709         |          |     |                 |          |                   |            |                   |
| DMN              | .520     | .218     | .740         | .624     |     | .700            | .712     | .484              | .994       | .919              |
| Perception-pain  | .637     | .364     | .752         | .624     | .700|                 | .576     | .669              | .531       | .123              |
| Auditory         | .317     | .315     | .016         | .276     | .712| .576            | .176     |                   | .738       | .981              |
| Cognition-language | .724     | .509     | .650         | .493     | .484| .669            | .176     |                   | .738       | .981              |
| Cerebellum       | .445     | .562     | .220         | .839     | .994| .531            | .731     | .738              |            |                   |
| Executive control| .006     | .759     | .369         | .163     | .919| .123            | .077     | .981              | .874       |                   |

Note. GLM p-values of two-sided interaction effect session (Pre vs Post) * group (primiparous vs control) of between-network correlations of all networks. *P<0.05 corrected for multiple comparisons. None of these effects survive a correction for multiple comparisons.

Supplementary Table 24. Baseline comparisons (PRE) neural metabolite concentrations.

| Metabolite | T (U) | P (p U) |
|------------|-------|---------|
| tNAA       | 1.144 | .256    |
| Cho        | .142  | .887    |
| tCr        | .659  | (.512   |
|            | (695) | (.783)  |
| Glu        | 1.646 | .104    |
| Ins        | .117  | .907    |

Note. Comparisons between the metabolite concentrations in the Pre session between women who were pregnant between scans (PRG) in comparison to women who were not (CTR) in the Posterior Cingulate Cortex. In case of any deviations from normality, non-parametric Mann-Whitney U tests were performed. The U values and p-values of these tests are reported between brackets in the table. None of these effects survive a correction for multiple comparisons. tNAA = N-acetylaspartate (including contributions from N-acetylaspartylglutamate), Cho =
Choline (phosphorylcholine and glycerophosphorylcholine), tCr = Creatine (creatine and phosphocreatine), Glu = Glutamate, Ins = myo-Inositol.

**Supplementary Table 25. Changes in neural metabolite concentrations (PRE to POST).**

| Metabolite | Session | Metabolite concentrations | F (U) | P (p U) |
|------------|---------|---------------------------|-------|---------|
| tNAA       | PRE     | 11.18 ± .41               |       |         |
|            | POST    | 11.38 ± .56               |       |         |
| Cho        | PRE     | 1.21 ± .12                | 4.316 | .041    |
|            | POST    | 1.38 ± .13                |       |         |
| tCr        | PRE     | 7.50 ± .51                | 4.136 | .046    |
|            | POST    | 7.84 ± .41                |       |         |
| Glu        | PRE     | 9.67 ± .68                | .031  | .861    |
|            | POST    | 9.99 ± .64                |       |         |
| Ins        | PRE     | 4.38 ± .48                | 2.156 | .146    |
|            | POST    | 4.75 ± .54                | (530) | (.047)  |

**Note.** Changes in metabolite concentrations between Pre and Post sessions in women who were pregnant between scans (PRG) in comparison to women who were not (CTR) in the Posterior Cingulate Cortex. In case of any deviations from normality in one of the groups or sessions, non-parametric Mann-Whitney U tests were performed on the Post-Pre difference values. The U values (“U”) and p-values (“p U”) of these tests are reported between brackets in the table. None of these effects survive a correction for multiple comparisons. tNAA = N-acetylaspartate (including contributions from N-acetylaspartylglutamate), Cho = Choline (phosphorylcholine and glycerophosphorylcholine), tCr = Creatine (creatine and phosphocreatine), Glu = Glutamate, Ins = myo-Inositol.

**Supplementary Table 26. Effect sizes for the changes (PRE to POST) in spectroscopic results.**

| Metabolite | $\eta^2$ |
|------------|----------|
| tNAA       | .001     |
| Cho        | .055     |
| tCr        | .053     |
| Glu        | .000     |
| Ins        | .028     |

**Note.** Partial eta squared values for the changes in metabolite concentrations between Pre and Post sessions in women who were pregnant between scans (PRG) in comparison to women who were not (CTR) in the Posterior Cingulate Cortex Volume of Interest. tNAA = N-acetylaspartate (including contributions from N-acetylaspartylglutamate), Cho = Choline (phosphorylcholine and glycerophosphorylcholine), tCr = Creatine (creatine and phosphocreatine), Glu = Glutamate, Ins = myo-Inositol.

**Supplementary Table 27. Changes in neural metabolite concentrations (PRE to POST) excluding the participants with the delayed time interval.**
| Metabolite | F (U) | P (p U) |
|-----------|-------|---------|
| tNAA      | 0.062 | 0.804   |
| Cho       | 3.880 | 0.053   |
| tCr       | 3.877 (495) | 0.053 (0.059) |
| Glu       | 0.041 | 0.841   |
| Ins       | 1.477 (497) | 0.228 (0.062) |

**Note.** Changes in metabolite concentrations between Pre- and Post-pregnancy sessions in women who were pregnant between scans (PRG) in comparison to women who were not (CTR), excluding the women who initially did not participate in the Post session and therefore had a delayed time interval (>800 days) between the sessions (leaving a PRG sample size of N = 36). Session (pre-post pregnancy) * group (PRG, CTR) interaction effects are reported. In case of any deviations from normality in one of the groups or sessions, non-parametric Mann-Whitney U tests were performed on the Post-Pre difference values. The U values ("U") and p-values ("p U") of these tests are reported between brackets in the table. None of these effects survive a correction for multiple comparisons. tNAA = N-acetylaspartate (including contributions from N-acetylaspartylglutamate), Cho = Choline (phosphorylcholine and glycerophosphorylcholine), tCr = Creatine (creatine and phosphocreatine), Glu = Glutamate, Ins = myo-Inositol.

**Supplementary Table 28.** Changes in metabolite concentrations (PRE to POST) excluding the participant who took part in the PRG group after completing the control trajectory.

| Metabolite | F (U) | P (p U) |
|-----------|-------|---------|
| tNAA      | 0.154 | 0.696   |
| Cho       | 4.223 | 0.043   |
| tCr       | 4.075 (520) | 0.047 (0.052) |
| Glu       | 0.024 | 0.877   |
| Ins       | 2.195 (513) | 0.143 (0.044) |

**Note.** Changes in metabolite concentrations between Pre and Post sessions in women who were pregnant between scans (PRG) in comparison to women who were not (CTR), excluding the woman who had participated in this study both as a nulliparous control and subsequently also as a pregnant women (leaving a PRG sample size of N = 38). Session (pre-post pregnancy) * group (PRG, CTR) interaction effects are reported. In case of any deviations from normality in one of the groups or sessions, non-parametric Mann-Whitney U tests were performed on the Post-Pre difference values. The U values ("U") and p-values ("p U") of these tests are reported between brackets in the table. None of these effects survive a correction for multiple comparisons. tNAA = N-acetylaspartate (including contributions from N-acetylaspartylglutamate), Cho = Choline (phosphorylcholine and glycerophosphorylcholine), tCr = Creatine (creatine and phosphocreatine), Glu = Glutamate, Ins = myo-Inositol.
Supplementary Table 29. Changes in metabolite concentrations (PRE to POST) excluding the women who underwent fertility treatment or who had twins.

| Metabolite | F (U) | P (p U) |
|------------|-------|---------|
| tNAA       | .005  | .944    |
| Cho        | 3.940 | .051    |
| tCr        | 3.575 | .063    |
|            | (528) | (.064)  |
| Glu        | .040  | .842    |
|            | (526) | (.061)  |
| Ins        | 4.323 | .041    |
|            | (526) | (.061)  |

*Note.* Changes in metabolite concentrations between Pre- and Post-pregnancy sessions in women who were pregnant between scans (PRG) in comparison to women who were not (CTR), excluding the women who underwent fertility treatment or who had twins (leaving a PRG sample size of N = 35). Session (pre-post pregnancy) * group (PRG, CTR) interaction effects are reported. In case of any deviations from normality in one of the groups or sessions, non-parametric Mann-Whitney U tests were performed on the Post-Pre difference values. The U values (“U”) and p-values (“p U”) of these tests are reported between brackets in the table. None of these effects survive a correction for multiple comparisons. tNAA = N-acetylaspartate (including contributions from N-acetylaspartylglutamate), Cho = Choline (phosphorylcholine and glycerophosphorylcholine), tCr = Creatine (creatine and phosphocreatine), Glu = Glutamate, Ins = myo-Inositol.

Supplementary Table 30. Changes in metabolite concentrations (PRE to POST) corrected for a previous history of medical or psychiatric disorders.

| Metabolite | F     | p     |
|------------|-------|-------|
| tNAA       | .710  | .403  |
| Cho        | 4.135 | .046  |
| tCr        | 3.669 | .060  |
| Glu        | .361  | .550  |
| Ins        | 1.014 | .318  |

*Note.* Changes in metabolite concentrations between Pre- and Post-pregnancy sessions in women who were pregnant between scans (PRG) in comparison to women who were not (CTR), while correcting for a previous history of medical or psychiatric disorders. Session (pre-post pregnancy) * group (PRG, CTR) interaction effects are reported. None of these effects survive a correction for multiple comparisons. tNAA = N-acetylaspartate (including contributions from N-acetylaspartylglutamate), Cho = Choline (phosphorylcholine and glycerophosphorylcholine), tCr = Creatine (creatine and phosphocreatine), Glu = Glutamate, Ins = myo-Inositol.
Supplementary Table 31. Correlations between observed changes across pregnancy.

| Changes          | R (rho) | P (p rho) |
|------------------|---------|-----------|
| GM & rsfMRI      | -.23    | .784      |
| GM & tCr         | .18     | .121      |
| GM & Cho         | .14     | .177      |
| GM & Ins         | .56     | .001      |
| rsfMRI & tCr     | .092    | .579      |
| rsfMRI & Cho     | .031    | .849      |
| rsfMRI & Ins     | .200 (.186) | .221 (.258) |

**Note.** Correlation results between the observed changes across pregnancy. In case of deviations from normality, a non-parametric Spearman’s correlation test was performed rather than a Pearson’s test. Spearman’s rho (“rho”) and the p-values for this test (“p rho”) are then also reported in the table. The correlations with grey matter were performed using multivariate regression analyses using Kernel Ridge Regression. GM=observed changes in grey matter volume, rsfMRI=observed changes in temporal coherence of the Default Mode Network, tCr=observed changes in creatine concentrations, Cho=observed changes in choline concentrations, Ins=observed changes in myo-inositol.
Supplementary Table 32. Changes in grey matter volume in the late postpartum period relative to the pre-pregnancy session (PRE to POST+1y).

| Contrasts               | Regions                                                                 | MNI coordinates | $T$     | $p$ (FWE-corrected) | Cluster Size (mm$^3$) |
|-------------------------|--------------------------------------------------------------------------|------------------|---------|---------------------|----------------------|
| Increase                |                                                                          |                  |         |                     |                      |
| Decrease               | LR Superior Medial Frontal Cortex, LR Superior, Middle, Inferior Frontal Gyrus, LR Orbitofrontal | 45 10 36 | 16.38   | <0.001              | 85673                |
|                         | Cortext, LR Supplementary Motor Area, LR Precentral Gyrus, LR Anterior, Middle Cingulate | -24 22 51 | 15.89   | <0.001              |                      |
|                         | Cortext, LR Gyrus Rectus, LR Insula, LR Olfactory Gyrus, LR Temporal Pole, LR Caudate, LR Putamen, LR Fusiform, R Pallidum | -46 20 22 | 14.40   | <0.001              |                      |
|                         | LR Precuneus, LR Middle, Posterior Cingulate                           | 38 -8 20 | 7.07    | <0.001              | 108                  |
|                         | Cortex, LR Cuneus, LR Calcarine Sulcus, LR Cuneus                      | 22 -3 70 | 6.57    | <0.001              | 4                    |
|                         | LR Superior, Inferior Parietal Lobule, L Superior, Middle, Inferior Temporal Gyrus, L Superior | 9 -60 34 | 11.23   | <0.001              | 5954                 |
|                         | Temporal Sulcus, L Angular Gyrus, L Supramarginal                      | 10 -54 24 | 10.28   | <0.001              |                      |
|                         | Gyrus, L Temporo-Parietal Junction, L Superior, Middle, Inferior Occipital Gyrus, L Thalamus, L Parahippocampal Gyrus, L Fusiform, L Lingual Gyrus | 12 -44 38 | 9.87    | <0.001              |                      |
|                         | R Angular Gyrus, R Supramarginal Gyrus, R Temporo-Parietal Junction, R Superior, Middle | 50 -58 33 | 10.83   | <0.001              | 3258                 |
|                         | Occipital Gyrus, R Superior, Inferior Parietal                         | 39 -50 48 | 8.23    | <0.001              |                      |
|                         | Lobule, R Lingual Gyrus, R Fusiform, R Thalamus                        | 38 -60 40 | 8.15    | <0.001              |                      |
|                         | LR Anterior, Posterior Cerebellum                                      | 30 -52 -3 | 7.51    | <0.001              | 41                   |
|                         |                                                                           | 33 -87 3 | 6.95    | <0.001              | 19                   |
|                         |                                                                           | 10 -21 9  | 6.84    | <0.001              | 5                    |
|                         |                                                                           | 32 -33 -18 | 6.80  | <0.001              | 11                   |
|                         |                                                                           | 14 -74 -6 | 6.53    | <0.001              | 2                    |
|                         | L Caudate, L Putamen                                                   | -10 12 8  | 9.46    | <0.001              | 528                  |
|                         |                                                                           | -21 3 0  | 6.83    | <0.001              |                      |

Note. Grey matter volume changes between the late postpartum session and the pre-conception baseline in the PRG participants. Statistics are extracted from one-sample t-tests performed within the framework of an SPM12 General Linear Model and are one-sided (as is standard in SPM). P-value at peak voxel (whole-brain FWE corrected) is reported extracted from one-sample t-tests perform. L = left, R = right.
Supplementary Figure 3. Plots of volume changes from pre-conception to late postpartum of the PRG and CTR sample. Mean (± SEM) grey matter volume changes at each Post session (Post and Post+1y) relative to the Pre-pregnancy baseline of the most significant clusters (i.e., T > 8), extracted from the smoothed normalized Jacobian difference images for each cluster. Red line represents control group (no Post+1y data is available of the control group). Blue bar represents pregnancy. GM = grey matter, L = left, R = right, PP = Postpartum.
Supplementary Table 33. Changes in grey matter volume in primiparous mothers across the postpartum period (POST to POST+1y).

| Contrasts | Regions | MNI coordinates | T | p (FWE-corrected) | Cluster Size (mm$^3$) |
|-----------|---------|-----------------|---|------------------|-----------------------|
| Increase  | R Hippocampus, R Parahippocampal Gyrus, R Precuneus, R Posterior Cingulate Cortex, R Lingual Gyrus, R Calcarine Sulcus, R Thalamus, R Fusiform, R Inferior Temporal Gyrus, R Cerebellum | 28 -18 -15 10.49 | <0.001 | 780 |
| Increase  | | 24 -32 -14 7.28 | <0.001 | |
| Increase  | | 32 -38 -24 7.01 | <0.001 | |
| Increase  | | 15 -44 8 7.66 | <0.001 | |
| Increase  | | 24 -32 8 7.14 | <0.001 | |
| Increase  | | 40 -21 -26 7.18 | <0.001 | |
| Increase  | | 16 -64 -14 7.10 | <0.001 | |
| Increase  | L Hippocampus | -32 -40 -6 9.43 | <0.001 | 720 |
| Increase  | | -27 -16 -10 7.49 | <0.001 | |
| Increase  | | -10 -34 9 8.26 | <0.001 | |
| Increase  | R Superior, Middle, Inferior Frontal Gyrus, R Superior Medial Frontal Cortex, R Orbitofrontal Cortex, R Insula | 26 57 6 8.46 | <0.001 | 847 |
| Increase  | | 36 54 -2 7.30 | <0.001 | |
| Increase  | | 14 68 14 7.19 | <0.001 | |
| Increase  | | 50 -10 12 7.85 | <0.001 | 210 |
| Increase  | | 22 18 48 7.46 | <0.001 | 339 |
| Increase  | | 16 50 24 6.74 | <0.001 | 71 |
| Increase  | | 50 10 8 6.67 | <0.001 | 18 |
| Increase  | | 32 45 20 6.65 | <0.001 | 35 |
| Increase  | | 44 -76 32 6.55 | <0.001 | 10 |
| Increase  | | 46 22 -3 6.44 | <0.001 | 6 |
| Increase  | L Superior, Middle, Inferior Frontal Gyrus, L Superior Medial Frontal Cortex, L Orbitofrontal Cortex | -21 66 6 8.05 | <0.001 | 1176 |
| Increase  | | -15 64 15 7.56 | <0.001 | |
| Increase  | | -32 56 4 7.36 | <0.001 | |
| Increase  | | -2 56 38 7.92 | <0.001 | 564 |
| Increase  | | 0 45 46 6.88 | <0.001 | |
| Increase  | | -9 34 50 6.76 | <0.001 | 55 |
| Increase  | | -27 8 52 6.76 | <0.001 | 79 |
| Increase  | | -24 30 36 6.65 | <0.001 | 41 |
| Increase  | | -45 39 3 6.52 | <0.001 | 15 |
| Increase  | L Superior, Middle Temporal Gyrus, L Superior Temporal Sulcus, L Angular Gyrus, L Supramarginal gyrus, L Temporo-Parietal Junction, L Middle Occipital Gyrus | -48 -60 22 7.54 | <0.001 | 295 |
| Increase  | | -62 -54 22 6.69 | <0.001 | |
| Increase  | | -44 -69 36 6.99 | <0.001 | 83 |
| Increase  | | -33 -80 24 6.45 | <0.001 | 1 |
| Increase  | LR Posterior Cerebellum | 2 -50 -45 8.27 | <0.001 | 605 |
| Increase  | | 0 -54 -54 7.85 | <0.001 | |
| Increase  | | -4 -62 -48 7.39 | <0.001 | |
| Increase  | | 16 -40 -48 6.80 | <0.001 | 18 |
| Increase  | | 12 -39 -21 6.54 | <0.001 | 7 |
| Increase  | | 12 -45 -42 6.43 | <0.001 | 4 |
| Increase  | LR Precuneus, L Cuneus | -2 -68 27 7.32 | <0.001 | 150 |
| Increase  | LR Superior Medial Frontal Cortex | 3 28 42 6.67 | <0.001 | 28 |

Note. Changes in grey matter volume across the postpartum period in primiparous mothers. Statistics are extracted from one-sample t-tests performed within the framework of an SPM12 General Linear Model and are one-sided (as is standard in SPM). P-value at peak voxel (whole-brain FWE corrected) is reported. L = left, R = right.
Supplementary Figure 4. Changes in DMN coherence from pre-conception until the late postpartum period. Mean (± SEM) levels of DMN connectivity at each Post session (Post and Post+1y) relative to the Pre-pregnancy baseline (N = 28) in women who became pregnant during this study. Blue bar represents pregnancy. GM = grey matter, L = left, R = right, PP = Postpartum.
Supplementary Figure 5. Correlation results prenatal measures. Plot depicting correlations between the neural changes across pregnancy and all prenatal measures. DMN coherence = changes in Default Mode Network coherence between Pre and Post sessions. Grey matter volume = changes in grey matter volume between Pre and Post sessions, 1-P = reverse p-values, PAI = Prenatal Attachment Inventory, MAAS = Maternal Antenatal Attachment Scale, Nesting = Nesting Questionnaire, SCR = Skin Conductance Response.
Supplementary Figure 6. Functional correlates of neural changes across pregnancy (PRE to POST). Plots depicting correlations between the neural changes across pregnancy and a) the Differentiation scale of the Prenatal Attachment Inventory (PAI), b) interval between heart rate peaks (peak RR) in response to movies of laughing babies, c) the Social Selectivity Scale of the Nesting Behavior Questionnaire, d) the late postpartum Postpartum Bonding Questionnaire (PBQ, total score), e) the late postpartum Maternal Postnatal Attachment Scale (MPAS, total score). It should be noted that for the multivariate regression analyses, the depicted values represent predicted values of the correlate based on the pattern of brain changes across the whole brain and the depicted values thus do not represent the direction of the biological effect. Post-Pre ΔDMN = Difference in DMN coherence between Pre and Post session, Post-PreΔGM-based predictions = Predicted covariate values based on changes in grey matter between Pre and Post sessions defined by multivariate regression analyses.

Supplementary Table 34. Correlations between Nesting questionnaire and PRE to POST changes in DMN coherence.

| Measure                        | R (rho) | P (p rho) |
|--------------------------------|---------|-----------|
| Space Preparation: Cleaning    | .068    | .697      |
|                                | (.026)  | (.884)    |
| Space Preparation: Energy Burst| -.079   | .654      |
|                                | (-.054) | (.759)    |
| Social Selectivity: Familiarity Preference | .041    | .817      |
|                                | (.035)  | (.843)    |
| Social Selectivity: Novelty Aversion | -.229   | .186      |
|                                | (-.186) | (.284)    |

Note. Correlation results between the Nesting Questionnaire and the observed changes in the coherence of the default mode network. In case of deviations from normality, a non-parametric Spearman’s correlation test was performed rather than a Pearson’s test. Spearman’s rho (“rho”) and the p-values for this test (“p rho”) are then also reported in the table. *P<0.05 corrected for multiple comparisons (correlation-adjusted Bonferroni correction for the number of tests within the research question). **Effect also survives correction for multiple comparisons for all prenatal tests (correlation-adjusted Bonferroni correction for the number of performed tests with prenatal measures for this modality).
Supplementary Table 35. Correlations between Nesting questionnaire and PRE to POST changes in grey matter volume.

| Measure                          | R   | p   |
|----------------------------------|-----|-----|
| Space Preparation: Cleaning      | -.34| .866|
| Space Preparation: Energy Burst  | .33 | .040|
| Social Selectivity: Familiarity Preference | -.00 | .372|
| Social Selectivity: Novelty Aversion | .50 | .003**|

*Note.* Correlation results between the Nesting Questionnaire and the observed changes in grey matter volume based on multivariate regression analyses. It should be noted that for these analyses the R cannot be interpreted as a direct reflection of the direction of the biological effect, since this statistic is based on patterns of brain changes across the whole brain. *P<0.05 corrected for multiple comparisons (correlation-adjusted Bonferroni correction for the number of tests within the research question). **effect also survives correction for multiple comparisons for all prenatal tests (correlation-adjusted Bonferroni correction for the number of performed tests with prenatal measures for this modality).

Supplementary Table 36. Correlations between PAI, MAAS and PRE to POST changes in DMN coherence.

| Measure                          | R (rho) | P (p rho) |
|----------------------------------|---------|-----------|
| PAI Anticipation                 | .110    | .529      |
| PAI Differentiation              | .399    | .018*     |
| PAI Interaction                  | .094    | .590      |
| MAAS Quality of Attachment       | .189    | .277      |
| MAAS Time spent in Attachment Mode | (.110) | (.530) |

*Note.* Correlation results between the Prenatal Attachment Inventory (PAI) and Maternal Antenatal Attachment Scale (MAAS) and the observed changes in default mode network coherence. In case of deviations from normality, a non-parametric Spearman’s correlation test was performed rather than a Pearson’s test. Spearman’s rho (“rho”) and the p-values for this test (“p rho”) are then also reported in the table. *P<0.05 corrected for multiple comparisons (correlation-adjusted Bonferroni correction for the number of tests within the research question). **effect also survives correction for multiple comparisons for all prenatal tests (correlation-adjusted Bonferroni correction for the number of performed tests with prenatal measures for this modality).

Supplementary Table 37. Correlations between PAI, MAAS and PRE to POST changes in grey matter volume.

| Measure                          | R   | p   |
|----------------------------------|-----|-----|
| PAI Anticipation                 | -.34| .881|
| PAI Differentiation              | -.04| .488|
| PAI Interaction                  | -.04| .470|
| MAAS Quality of Attachment       | -.12| .584|
| MAAS Time spent in Attachment Mode | .01 | .373|

*Note.* Correlation results between the Prenatal Attachment Inventory (PAI) and Maternal Antenatal Attachment Scale (MAAS) and the changes in grey matter volume based on multivariate regression analyses. It should be noted that for these analyses the R cannot be interpreted as a direct reflection of the direction of the biological effect, since this statistic is based on patterns of brain changes across the whole brain. *P<0.05 corrected for multiple comparisons (correlation-adjusted Bonferroni correction for the number of tests within the research question).
**effect also survives correction for multiple comparisons for all prenatal tests (correlation-adjusted Bonferroni correction for the number of performed tests with prenatal measures for this modality).

**Supplementary Table 38. Correlations between physiological responses and PRE to POST changes in DMN coherence.**

| Measure                  | R (rho) | P (rho p) |
|--------------------------|---------|-----------|
| Heart rate Crying Babies | .224    | .235      |
| Heart rate Laughing Babies | .507   | .004**    |
| SCR Crying Babies        | -.075 (-.042) | .694 (.824) |
| SCR Laughing Babies      | .117 (.158) | .552 (.421) |

*Note.* Correlation results between the physiological responses (interval between heart rates and skin conductance response (SCR)) to movies of laughing and crying babies and the observed changes in default mode network coherence. In case of deviations from normality, a non-parametric Spearman’s correlation test was performed rather than a Pearson’s test. Spearman’s rho (“rho”) and the p-values for this test (“p rho”) are then also reported in the table. *P<0.05 corrected for multiple comparisons (correlation-adjusted Bonferroni correction for the number of tests within the research question). **effect also survives correction for multiple comparisons for all prenatal tests (correlation-adjusted Bonferroni correction for the number of performed tests with prenatal measures for this modality).

**Supplementary Table 39. Correlations between physiological responses and PRE to POST changes in grey matter volume.**

| Measure                  | R   | p   |
|--------------------------|-----|-----|
| Heart rate Crying Babies | -.14| .587|
| Heart rate Laughing Babies | -.15 | .615|
| SCR Crying Babies        | -.36| .878|
| SCR Laughing Babies      | .18 | .143|

*Note.* Correlation results between the physiological responses (interval between heart rates and skin conductance response (SCR)) to movies of laughing and crying babies and the changes in grey matter volume based on multivariate regression analyses. It should be noted that for these analyses the R cannot be interpreted as a direct reflection of the direction of the biological effect, since this statistic is based on patterns of brain changes across the whole brain. *P<0.05 corrected for multiple comparisons (correlation-adjusted Bonferroni correction for the number of tests within the research question). **effect also survives correction for multiple comparisons for all prenatal tests (correlation-adjusted Bonferroni correction for the number of performed tests with prenatal measures for this modality).
Supplementary Note 1

Postpartum Mother-Infant Bonding and Bonding Impairments

In addition to the association with gestational changes in a mother that prepare for motherhood, we wanted to investigate whether the observed brain changes across pregnancy could predict a mother’s bonding to her infant after birth and problems in the mother-infant relationship. Mother-infant bonding was measured using the Maternal Postnatal Attachment Scale (MPAS) in the early (Post) and late (Post+1y) postpartum session. In addition, impairments in the mother-infant relationship were assessed with the Postpartum Bonding Questionnaire (PBQ) in the early (Post) and late (Post+1y) postpartum session. First, correlation analyses were performed with the total MPAS and PBQ measures acquired in the early and late postpartum period to examine the time point when potential associations could be observed. These analyses revealed no associations with the early postpartum measures, while changes in default mode activity across pregnancy significantly predicted both mother-infant bonding and bonding impairments in the late postpartum period (Supplementary Figure 7, Supplementary Tables 40 – 43), with stronger brain changes being associated with more mother-infant bonding and less impairments in the mother-infant relationship. Subsequent analyses of the subscores of these scales in the late postpartum period did not render significant results, although a trend was observed with impaired bonding and the risk of infant rejection (Supplementary Tables 44 – 45).

Development of Mother-Infant Bonding and Bonding Problems across the Postpartum Period

Based on the observed associations with these measures in the late but not the early postpartum period, we hypothesized that neurally-regulated effects on bonding may actually only become evident in the postpartum period. Therefore, we performed supplementary analyses to test whether pregnancy-related changes in DMN coherence relate to subsequent developments in the mother-infant relationship that take place in the postpartum period (Supplementary Figure 8 and 9). These analyses showed that stronger pregnancy-related increases in DMN coherence predicted a stronger increase in bonding and a decrease in bonding impairments across the postpartum period (Supplementary Table 46). Associations were additionally observed with changes in the degree of pleasure experienced by the mother in the interaction with her baby and the absence of hostility (Supplementary Tables 47). Furthermore, pregnancy-related changes in DMN coherence were associated with postpartum changes in the risk of infant rejection and pathological anger across the postpartum period (Supplementary Tables 48). It should be noted that these changes were not associated with the neural changes across the postpartum period, only with the preceding changes across pregnancy. When applying a Bonferroni correction across all postnatal measures, the correlation between the changes in DMN coherence and the postpartum changes in mother-infant bonding and infant rejection and pathological anger remained significant. These findings thus reveal associations between pregnancy-related neural changes and mother-infant bonding and bonding impairments across the postpartum period, suggesting that neurogestational effects on aspects of maternal caregiving may affect the subsequent bonding of a mother to her infant across the postpartum period.
Supplementary Figure 7. Correlation results postnatal measures. Plot depicting correlations between the neural changes across pregnancy and all postnatal measures (except for the Post+1y – Post measures, depicted in the next figure). Note that the Post analyses for both modalities and the Post+1y analyses for grey matter volume have only been added for illustrative purposes but were not performed as part of the main analyses (since only the Post+1y totals of the MPAS were significant). DMN coherence = changes in Default Mode Network coherence between Pre and Post sessions. Grey matter volume = changes in grey matter volume between Pre and Post sessions, 1-P = reverse p-values, Post1 = Post+1y session, MPAS = Maternal Postnatal Attachment Scale, PBQ = Postpartum Bonding Questionnaire.
**Supplementary Table 40. Correlations between PRE to POST changes in DMN coherence and early (POST) and late postpartum (POST+1y) MPAS.**

| Measure                    | R (rho) | P (p rho) |
|----------------------------|---------|-----------|
| MPAS early postpartum      | .004    | .983      |
| (-.008)                    | (.962)  |           |
| MPAS late postpartum       | .440    | .019**    |

*Note.* Correlation results between the total Maternal Postnatal Attachment Scale (MPAS) scores in the early and late postpartum period with the observed changes in the coherence of the default mode network. In case of deviations from normality, a non-parametric Spearman’s correlation test was performed rather than a Pearson’s test. Spearman’s rho (“rho”) and the p-values for this test (“p rho”) are then also reported in the table. *P<0.05 corrected for multiple comparisons (correlation-adjusted Bonferroni correction for the number of tests within the research question). **effect also survives correction for multiple comparisons for all postpartum tests (correlation-adjusted Bonferroni correction for the number of performed tests with postpartum measures for this modality).*

**Supplementary Table 41. Correlations between PRE to POST changes in DMN coherence and early (POST) and late postpartum (POST+1y) PBQ.**

| Measure                    | R (rho) | P (p rho) |
|----------------------------|---------|-----------|
| PBQ early postpartum       | .075    | .648      |
| (-.048)                    | (.772)  |           |
| PBQ late postpartum        | -.413   | .029**    |

*Note.* Correlation results between the total Postpartum Bonding Questionnaire (PBQ) scores in the early and late postpartum period with the observed changes in the coherence of the default mode network. In case of deviations from normality, a non-parametric Spearman’s correlation test was performed rather than a Pearson’s test. Spearman’s rho (“rho”) and the p-values for this test (“p rho”) are then also reported in the table. *P<0.05 corrected for multiple comparisons (correlation-adjusted Bonferroni correction for the number of tests within the research question). **effect also survives correction for multiple comparisons for all postpartum tests (correlation-adjusted Bonferroni correction for the number of performed tests with postpartum measures for this modality).*

**Supplementary Table 42. Correlations between PRE to POST changes in grey matter volume and early (POST) and late postpartum (POST+1y) MPAS.**

| Measure                    | R        | p          |
|----------------------------|----------|------------|
| MPAS early postpartum      | -.05     | .482       |
| MPAS late postpartum       | -.56     | .972       |

*Note.* Correlation results between the Maternal Postnatal Attachment Scale (MPAS) scores in the early and late postpartum period with the observed changes in grey matter volume based on multivariate regression analyses. It should be noted that for these analyses the R cannot be interpreted as a direct reflection of the direction of the biological effect, since this statistic is based on patterns of brain changes across the whole brain. *P<0.05 corrected for multiple comparisons (correlation-adjusted Bonferroni correction for the number of tests within the research question). **effect also survives correction for multiple comparisons for all postpartum tests (correlation-adjusted Bonferroni correction for the number of performed tests with postpartum measures for this modality).
Supplementary Table 43. Correlations between PRE to POST changes in grey matter volume and early (POST) and late postpartum (POST+1y) PBQ.

| Measure               | R   | p    |
|-----------------------|-----|------|
| PBQ early postpartum  | .05 | .321 |
| PBQ late postpartum   | -.28| .753 |

Note. Correlation results between the Postpartum Bonding Questionnaire (PBQ) scores in the early and late postpartum period with the observed changes in grey matter volume based on multivariate regression analyses. It should be noted that for these analyses the R cannot be interpreted as a direct reflection of the direction of the biological effect, since this statistic is based on patterns of brain changes across the whole brain. *P<0.05 corrected for multiple comparisons (correlation-adjusted Bonferroni correction for the number of tests within the research question). **effect also survives correction for multiple comparisons for all postpartum tests (correlation-adjusted Bonferroni correction for the number of performed tests with postpartum measures for this modality).

Supplementary Table 44. Correlations between PRE to POST changes in DMN coherence and late postpartum (Post+1y) MPAS.

| Measure               | R (rho) | P (p rho) |
|-----------------------|---------|-----------|
| Quality of Attachment | .311 (.224) | .107 (.251) |
| Absence of Hostility  | .289 | .136 |
| Pleasure in Interaction | .434 (.296) | .021 (.126) |

Note. Correlation results between the Maternal Postnatal Attachment Scale (MPAS) scores in the late postpartum period (Post+1) with the observed changes in the coherence of the default mode network. In case of deviations from normality, a non-parametric Spearman’s correlation test was performed rather than a Pearson’s test. Spearman’s rho (“rho”) and the p-values for this test (“p rho”) are then also reported in the table. *P<0.05 corrected for multiple comparisons (correlation-adjusted Bonferroni correction for the number of tests within the research question). **effect also survives correction for multiple comparisons for all postpartum tests (correlation-adjusted Bonferroni correction for the number of performed tests with postpartum measures for this modality).

Supplementary Table 45. Correlations between PRE to POST changes in DMN coherence and late postpartum (Post+1y) PBQ.

| Measure               | R (rho) | P (p rho) |
|-----------------------|---------|-----------|
| Impaired Bonding      | -.333 | .083 |
| Infant Rejection and Pathological Anger | -.479 (.358) | .010 (.061) |
| Anxiety of Care       | -.152 (.011) | .441 (.955) |
| Risk of Abuse         | -.319 (.166) | .098 (.397) |

Note. Correlation results between the Postpartum Bonding Questionnaire (PBQ) scores in the late postpartum period (Post+1year) with the observed changes in the coherence of the default mode network. In case of deviations from normality, a non-parametric Spearman’s correlation test was performed rather than a Pearson’s test. Spearman’s rho (“rho”) and the p-values for this test (“p rho”) are then also reported in the table. *P<0.05 corrected for multiple comparisons.
Supplementary Figure 8. Correlation results postnatal measures. Plot depicting correlations between the neural changes across pregnancy and the Post+1y – Post measures. Note that these analyses for grey matter volume have only been added for illustrative purposes but were not performed as part of the main analyses (since only the Post+1y - Post totals of the MPAS were significant). DMN coherence = changes in Default Mode Network coherence between Pre and Post sessions. Grey matter volume = changes in grey matter volume between Pre and Post sessions, 1-P = reverse p-values, Post1 – Post = Post+1y - Post session, MPAS = Maternal Postnatal Attachment Scale, PBQ = Postpartum Bonding Questionnaire.
Supplementary Table 46. Correlations between PRE to POST changes in DMN coherence changes across pregnancy MPAS and PBQ changes across postpartum period (POST to POST+1y).

| Measure             | R   | p   |
|---------------------|-----|-----|
| MPAS total          | .628| <.0001** |
| PBQ total           | -.430| .025* |

Note. Correlation results between the changes in total Maternal Postnatal Attachment Scale (MPAS) and Postpartum Bonding Questionnaire (PBQ) scores across the postpartum period with the observed changes across pregnancy in the coherence of the default mode network. *P<0.05 corrected for multiple comparisons (correlation-adjusted Bonferroni correction for the number of tests within the research question). **effect also survives correction for multiple comparisons for all postpartum tests (correlation-adjusted Bonferroni correction for the number of performed tests with postpartum measures for this modality).

Supplementary Figure 9. Correlations between PRE to POST neural changes with postpartum changes in mother-infant bonding. Plots depicting correlations between neural changes across pregnancy and the postpartum development of a) mother-infant bonding extracted from the Maternal Postnatal Attachment Scale (MPAS, total score), b) the Pleasure in Interaction extracted from the MPAS, c) the Absence of Hostility extracted from the MPAS, d) problems in the mother-infant relationship extracted from the Postpartum Bonding Questionnaire (PBQ, total score), e) Infant Rejection extracted from the PBQ. Post-Pre ΔDMN = Difference in DMN coherence between Pre and Post session.

Supplementary Table 47. Correlations between DMN coherence change across pregnancy (PRE to POST) and MPAS changes across postpartum period (POST to POST+1y).

| Measure                | R (rho) | P (p rho) |
|------------------------|---------|-----------|
| Quality of Attachment  | .228    | .253      |
| Absence of Hostility   | .477    | .012*     |
| Pleasure in Interaction| .545 (.463) | .003 (.015*) |

Note. Correlation results between the changes in Maternal Postnatal Attachment Scale (MPAS) scores across the postpartum period with the observed changes across pregnancy in the coherence of the default mode network. In
case of deviations from normality, a non-parametric Spearman’s correlation test was performed rather than a Pearson’s test. Spearman’s rho (“rho”) and the p-values for this test (“p rho”) are then also reported in the table. *P<0.05 corrected for multiple comparisons (correlation-adjusted Bonferroni correction for the number of tests within the research question). **effect also survives correction for multiple comparisons for all postpartum tests (correlation-adjusted Bonferroni correction for the number of performed tests with postpartum measures for this modality).

Supplementary Table 48. Correlations between DMN coherence change across pregnancy (PRE to POST) and PBQ changes across postpartum period (POST to POST+1y)

| Measure                          | R (rho)        | P (p rho)  |
|----------------------------------|----------------|------------|
| Impaired Bonding                 | -.303          | .125       |
| Infant Rejection and Pathological Anger | -.473 (-.564) | .013 (.002**) |
| Anxiety of Care                  | -.190 (-.197)  | .344 (.323) |
| Risk of Abuse                    | -.342 (-.289)  | .081 (.143) |

Note. Correlation results between the changes in Postpartum Bonding Questionnaire (PBQ) scores across the postpartum period with the observed changes across pregnancy in the coherence of the default mode network. In case of deviations from normality, a non-parametric Spearman’s correlation test was performed rather than a Pearson’s test. Spearman’s rho (“rho”) and the p-values for this test (“p rho”) are then also reported in the table. *P<0.05 corrected for multiple comparisons (correlation-adjusted Bonferroni correction for the number of tests within the research question). **effect also survives correction for multiple comparisons for all postpartum tests (correlation-adjusted Bonferroni correction for the number of performed tests with postpartum measures for this modality).
Supplementary Table 49. Correlations between hormones and changes in grey matter volume across pregnancy (PRE to POST).

| Measure     | R   | p    |
|-------------|-----|------|
| Estradiol   | .36 | .017*|
| Estriol     | .38 | .022 |
| Progesterone| -.23| .774 |
| Cortisol    | .02 | .353 |

Note. Correlation results between hormone levels across pregnancy and the changes in grey matter volume based on multivariate regression analyses. It should be noted that for these analyses the R cannot be interpreted as a reflection of the direction of the biological effect, since this statistic is based on patterns of brain changes across the whole brain. *P<0.05 corrected for multiple comparisons (correlation-adjusted Bonferroni correction for the number of hormones).

Supplementary Table 50. Correlations between hormones and DMN coherence across pregnancy (PRE to POST).

| Measure     | R (rho) | p (p rho) |
|-------------|---------|-----------|
| Estradiol   | .037 (-.007) | .827 (.968) |
| Estriol     | .077 (.012) | .651 (.942) |
| Progesterone| .015     | .928      |
| Cortisol    | .099     | .561      |

Note. Correlation results between hormone levels across pregnancy and the observed changes in DMN coherence. In case of deviations from normality, a non-parametric Spearman’s correlation test was performed rather than a Pearson’s test. Spearman’s rho (“rho”) and the p-values for this test (“p rho”) are then also reported in the table. *P<0.05 corrected for multiple comparisons (correlation-adjusted Bonferroni correction for the number of hormones).

Supplementary Figure 10. Correlation between mean pregnancy Estradiol levels and the changes in brain structure across pregnancy (PRE to POST). a) Scatter plot depicting results from the multivariate regression analyses examining the relation between mean Estradiol levels (pg/ml) divided by creatinine (mg/dl) across pregnancy and changes in Grey Matter volume across pregnancy. It should be noted that for these analyses the direction of the depicted correlation cannot be interpreted as a reflection of the direction of the biological effect,
since this statistic is based on patterns of brain changes across the whole brain. b) Weight map depicting the relative contribution of each voxel to the multivariate regression. Note that blue colors depict a negative contribution to the regression, reflecting that higher Estradiol levels in pregnancy are associated with stronger volume reductions within the blue regions. Post-PreΔGM-based predictions = Predicted covariate values based on changes in grey matter between Pre and Post sessions defined by multivariate regression analyses.

Supplementary Table S1. Correlations between estradiol levels and grey matter volume across pregnancy (PRE to POST).

| Pregnancy week | R   | p   |
|----------------|-----|-----|
| 8              | .06 | .260|
| 12             | .19 | .039|
| 16             | -.01| .375|
| 20             | .07 | .250|
| 24             | .22 | .095|
| 28             | .25 | .041|
| 32             | .41 | .016|
| 36             | .22 | .076|
| 38             | .27 | .080|

*Note.* Correlation results between Estradiol levels across pregnancy and the changes in grey matter volume based on multivariate regression analyses. Note that correlations were not performed with any hormone levels extracted from week 40 due to the low number of available samples. It should be noted that for these analyses the R cannot be interpreted as a reflection of the direction of the biological effect, since this statistic is based on patterns of brain changes across the whole brain.

Supplementary Table S2. Correlations between osmolality levels and PRE to POST changes in grey matter volume.

| Osmolality levels | R   | p   |
|-------------------|-----|-----|
| Trimester 1       | -.38| .891|
| Trimester 2       | -.10| .570|
| Trimester 3       | .17 | .133|
| Whole pregnancy   | -.15| .628|

*Note.* Correlation results between mean osmolality levels averaged across whole pregnancy and for each of the trimesters of pregnancy with the changes in grey matter volume based on multivariate regression analyses. It should be noted that for these analyses the R cannot be interpreted as a reflection of the direction of the biological effect, since this statistic is based on patterns of brain changes across the whole brain. *P<0.05 corrected for multiple comparisons.

Supplementary Table S3. Correlations between osmolality levels and PRE to POST changes in DMN coherence.

| Osmolality levels | R   | p   |
|-------------------|-----|-----|
| Trimester 1       | .048| .791|
| Trimester 2       | .065| .704|
| Trimester 3       | -.097| .570|
| Whole pregnancy   | .041| .808|

*Note.* Correlation results between mean osmolality levels averaged across whole pregnancy and for each of the trimesters of pregnancy with the changes in default mode network coherence.*P<0.05 corrected for multiple comparisons.
Supplementary Table 54. Correlations between osmolality levels and PRE to POST changes in choline across pregnancy.

| Osmolality levels | R   | p    |
|-------------------|-----|------|
| Trimester 1       | .257| .156 |
| Trimester 2       | -.087| .612 |
| Trimester 3       | .390| .019 |
| Whole pregnancy   | .310| .079 |

Note. Correlation results between mean osmolality levels averaged across whole pregnancy and for each of the trimesters of pregnancy with the changes in Choline across pregnancy.

Supplementary Table 55. Correlations between osmolality levels and PRE to POST changes in creatine across pregnancy.

| Osmolality levels | R   | p    |
|-------------------|-----|------|
| Trimester 1       | .147| .423 |
| Trimester 2       | -.207| .227 |
| Trimester 3       | .308| .068 |
| Whole pregnancy   | .174| .310 |

Note. Correlation results between mean osmolality levels averaged across whole pregnancy and for each of the trimesters of pregnancy with the changes in Creatine across pregnancy.

Supplementary Table 56. Correlations between osmolality levels and PRE to POST changes in glutamate across pregnancy.

| Osmolality levels | R   | p    |
|-------------------|-----|------|
| Trimester 1       | .287| .111 |
| Trimester 2       | -.015| .930 |
| Trimester 3       | .431| .009* |
| Whole pregnancy   | .340| .039 |

Note. Correlation results between mean osmolality levels averaged across whole pregnancy and for each of the trimesters of pregnancy with the changes in glutamate across pregnancy.

Supplementary Table 57. Correlations between osmolality levels and PRE to POST changes in myo-inositol across pregnancy.

| Osmolality levels | R   | p    |
|-------------------|-----|------|
| Trimester 1       | .038| .834 |
| Trimester 2       | -.063| .715 |
| Trimester 3       | .341| .042 |
| Whole pregnancy   | .229| .179 |

Note. Correlation results between mean osmolality levels averaged across whole pregnancy and for each of the trimesters of pregnancy with the changes in myo-inositol across pregnancy.
Supplementary Table 58. Correlations between osmolality levels and PRE to POST changes in tNAA across pregnancy.

| Osmolality levels | R   | p    |
|-------------------|-----|------|
| Trimester 1       | .215| .236 |
| Trimester 2       | .283| .094 |
| Trimester 3       | .086| .617 |
| Whole pregnancy   | .209| .221 |

*Note.* Correlation results between mean osmolality levels averaged across whole pregnancy and for each of the trimesters of pregnancy with the changes in tNAA across pregnancy.
Supplementary Note 2

Stress
Becoming a mother represents a life-changing transition involving many drastic changes in a woman’s biology and environment and this can be a stressful period for many mothers. To measure psychological distress, we applied the K10 questionnaire during pregnancy and in the postpartum period. In addition, a questionnaire measuring subjective stress during these periods was applied to obtain an indication of the overall distress experienced by women during their pregnancy and in the postpartum period between delivery and the early postpartum session. Correlation analyses involving each of these measures during pregnancy and the postpartum period rendered no significant results (see Supplementary Tables 59-62), suggesting that stress did not represent a major factor in the induction of the observed neural changes. In addition, for completeness, the main models rendering the changes in brain structure and function were repeated while correcting for each of these stress variables, which indicated that the observed brain changes were also evident when correcting for the degree of stress experienced during pregnancy and the postpartum period (Supplementary Tables 63-70).

Sleep
Furthermore, when becoming a mother, many women experience drastic changes in sleep, especially in the early postpartum period. Therefore, women were asked to keep track of their sleep duration and the number of sleep disruptions, which were used as an indication of the women’s sleep quality. An average number of hours of sleep and an average number of sleep disruptions per night in the week preceding the pregnancy and postpartum sessions were included in correlation analyses. In addition, indications of the women’s sleep across pregnancy (in terms of the number of hours and sleep disruptions, until week 36 of pregnancy) and the early postpartum period (until the first postpartum session) were included in correlation analyses. All measures of sleep were included in correlation analyses with the observed changes in brain structure and function, which rendered no significant results (Supplementary Tables 71 and 72). In addition, the main models were repeated while correcting for each of these sleep variables, which rendered highly similar results (Supplementary Tables 73-84), suggesting that the women’s sleep does not represent a major factor contributing to the observed brain changes.

Duration of Exposure to Postpartum Factors
To further examine the contribution of postpartum factors to the observed changes, correlations were additionally performed with the time between delivery and the Post session, which represents the duration of exposure to postpartum factors until the women’s participation in the early postpartum session. These analyses indicated no significant correlations between this variable and the observed changes in brain structure and function (Supplementary Tables 85 and 86). Accordingly, models including this variable as a confounding factor also rendered similar results to the main models (Supplementary Tables 87 and 88).

Breastfeeding
Breastfeeding, which involves intense contact with the infant and its own repertoire of hormonal fluctuations, could also be hypothesized to potentially contribute to the observed neural changes. To examine the potential role of breastfeeding, we compared the changes in brain structure and function between women who breastfed their infant and women who did not. These analyses did not render any significant results. In addition, within the group of women who breastfed their children, correlations were performed with the number of feedings per 24 hours in the period of the postpartum session, which also did not render significant results (see Supplementary Tables 89 and 90). Accordingly, including this variable as a confounding factor in the main analyses did not significantly alter the results (see Supplementary Tables 91 and 92).
Interestingly, a supplementary analysis examining the association between the total months of breastfeeding until the Post+1y session with changes in grey matter volume and DMN coherence across the postpartum period revealed a positive correlation between reversal of DMN coherence across the postpartum period and the duration of breastfeeding (Supplementary Tables 93 and 94), suggesting that prolonged breastfeeding may play a role/may stimulate the maintenance of these changes in DMN coherence.

**Type of delivery**
Finally, to investigate whether the type of delivery plays an important role in the observed brain changes, we compared the changes in brain structure and function between the women who gave birth by means of vaginal delivery to the women who delivered by means of a caesarean section. These comparisons not show significant differences in brain changes based on the type of childbirth.
### Supplementary Table 59. Correlations between K10 and PRE to POST changes in DMN coherence.

| Measures       | R (rho)   | P (p rho)  |
|----------------|-----------|------------|
| K10 Pregnancy  | .002      | .992       |
| K10 Postpartum | .119 (.155)| .472 (.345)|

*Note.* Correlation results between K10 scores acquired during pregnancy and the postpartum period and the observed changes in default mode network coherence. In case of deviations from normality, a non-parametric Spearman’s correlation test was performed rather than a Pearson’s test. Spearman’s rho (“rho”) and the p-values for this test (“p rho”) are then also reported in the table.

### Supplementary Table 60. Correlations between K10 and PRE to POST changes in grey matter volume.

| Measures       | R   | p    |
|----------------|-----|------|
| K10 Pregnancy  | -.12| .580 |
| K10 Postpartum | -.34| .898 |

*Note.* Correlation results between K10 scores acquired during pregnancy and the postpartum period and the observed changes in grey matter volume. It should be noted that for these analyses the R cannot be interpreted as a reflection of the direction of the biological effect, since this statistic is based on patterns of brain changes across the whole brain.

### Supplementary Table 61. Correlations between subjective stress and PRE to POST changes in DMN coherence.

| Measures               | R     | p    |
|------------------------|-------|------|
| Subjective Stress Pregnancy | -.243 | .213 |
| Subjective Stress Postpartum | -.211 | .282 |

*Note.* Correlation results between the women’s subjective stress experienced during pregnancy and the postpartum period and the observed changes in default mode network coherence.

### Supplementary Table 62. Correlations between subjective stress and PRE to POST changes in grey matter volume.

| Measures               | R     | p    |
|------------------------|-------|------|
| Subjective Stress Pregnancy | -.24  | .710 |
| Subjective Stress Postpartum | -.35  | .856 |

*Note.* Correlation results between the women’s subjective stress experienced during pregnancy and the postpartum period and the observed changes in grey matter volume. It should be noted that for these analyses the R cannot be interpreted as a reflection of the direction of the biological effect, since this statistic is based on patterns of brain changes across the whole brain.
Supplementary Table 63. Changes in DMN across pregnancy (PRE to POST) corrected for the K10 scale in the pregnancy period.

| Contrast   | Regions          | MNI coordinates | T   | P (FWE-corrected) | Cluster Size (mm³) |
|------------|------------------|-----------------|-----|-------------------|--------------------|
| Increases  | L Cuneus, R Cuneus | 6 -84 18        | 6.44| 0.001             | 243                |
| Decreases  | -                 |                 |     |                   |                    |

*Note.* Increases or decreases in within-network connectivity in the DMN in primiparous women between the preconception and the early postpartum session corrected for the K10 scale in the pregnancy period. Results are reported at a statistical threshold of p<0.05 FWE-corrected. L = left, R = right.

Supplementary Table 64. Changes in DMN across pregnancy (PRE to POST) corrected for the K10 scale in the early postpartum period.

| Contrast   | Regions    | MNI coordinates | T   | P (FWE-corrected) | Cluster Size (mm³) |
|------------|------------|-----------------|-----|-------------------|--------------------|
| Increases  | R Cuneus   | 9 -81 18        | 5.55| 0.006             | 108                |
| Decreases  | -          |                 |     |                   |                    |

*Note.* Increases or decreases in within-network connectivity in the DMN in primiparous women between the preconception and the early postpartum session corrected for the K10 scale in the early postpartum period. Results are reported at a statistical threshold of p<0.05 FWE-corrected. L = left, R = right.

Supplementary Table 65. Changes in DMN across pregnancy (PRE to POST) corrected for the degree of stress during pregnancy.

| Contrast   | Regions    | MNI coordinates | T   | P (FWE-corrected) | Cluster Size (mm³) |
|------------|------------|-----------------|-----|-------------------|--------------------|
| Increases  | R Cuneus   | 6 -81 15        | 5.53| 0.019             | 81                 |
| Decreases  | -          |                 |     |                   |                    |

*Note.* Increases or decreases in within-network connectivity in the DMN in primiparous women between the preconception and the early postpartum session corrected for stress during pregnancy. Results are reported at a statistical threshold of p<0.05 FWE-corrected. L = left, R = right.

Supplementary Table 66. Changes in DMN across pregnancy (PRE to POST) corrected for the degree of stress since birth.

| Contrast   | Regions    | MNI coordinates | T   | P (FWE-corrected) | Cluster Size (mm³) |
|------------|------------|-----------------|-----|-------------------|--------------------|
| Increases  | R Cuneus   | 6 -81 15        | 5.52| 0.019             | 81                 |
| Decreases  | -          |                 |     |                   |                    |

*Note.* Increases or decreases in within-network connectivity in the DMN in primiparous women between the preconception and the early postpartum session corrected for the amount of stress since birth. Results are reported at a statistical threshold of p<0.05 FWE-corrected. L = left, R = right.
### Supplementary Table 67. Changes in grey matter volume across pregnancy (PRE to POST) corrected for the K10 scale in the pregnancy period.

| Contrasts | Regions                                                                 | MNI coordinates | T (FWE-corrected) | Cluster Size (mm$^3$) |
|-----------|--------------------------------------------------------------------------|------------------|-------------------|-----------------------|
| Increases | -                                                                        |                  |                   |                       |
| Decreases | LR Superior, Middle, Inferior Frontal Gyrus, LR Superior Medial Frontal Cortex, LR Orbitofrontal Cortex, LR Superior, Middle, Inferior Temporal Gyrus, LR Precuneus, LR Superior, Inferior Parietal Gyrus, LR Anterior, Middle, Posterior Cingulate Cortex, LR Fusiform Gyrus, LR Precentral Gyrus, LR Postcentral Gyrus, LR Superior, Middle, Inferior Occipital Gyrus, LR Angular gyrus, LR Supplementary Motor Area, LR Supramarginal Gyrus, LR Anterior, Posterior Cerebellum, LR Insula, LR Superior, Middle Temporal Pole, LR Rolandic Operculum, LR Lingual Gyrus, LR Thalamus, LR Caudate Nucleus, LR Putamen, LR Calcarine Sulcus, LR Gyrus Rectus, LR Hippocampus, LR Parahippocampal Gyrus, LR Cuneus, LR Heschl’s Gyrus, Vermis, LR Olfactory Cortex, LR Pallidum, LR Paracentral Lobule, LR Superior Temporal Sulcus, LR Temporo-Parietal Junction | -66 -27 -15 18.49 <0.001 1223498 | -68 -41 -14 16.39 <0.001 | -36 24 -17 15.66 <0.001 |

Note. Increases or decreases in regional grey matter volumes in primiparous women between the pre-conception and the early postpartum session corrected for K10 in the pregnancy session. Statistics are extracted from one-sample t-tests performed within the framework of an SPM12 General Linear Model and are one-sided (as is standard in SPM). Results are reported at a statistical threshold of p<0.05 FWE-corrected. L = left, R = right.
Supplementary Table 68. Changes in grey matter volume across pregnancy (PRE to POST) corrected for the K10 scale in the postpartum period.

| Contrasts | Regions                                                                 | MNI coordinates | T (FWE-corrected) | Cluster Size (mm³) |
|-----------|--------------------------------------------------------------------------|-----------------|-------------------|--------------------|
| Increases | -                                                                        |                 |                   |                    |
| Decreases | LR Superior, Middle, Inferior Frontal Gyrus, LR Superior Medial Frontal Cortex, LR Orbitofrontal Cortex, LR Superior, Middle, Inferior Temporal Gyrus, LR Precuneus, LR Superior, Inferior Parietal Gyrus, LR Anterior, Middle, Posterior Cingulate Cortex, LR Fusiform Gyrus, LR Precentral Gyrus, LR Postcentral Gyrus, LR Superior, Middle, Inferior Occipital Gyrus, LR Angular gyrus, LR Supplementary Motor Area, LR Supramarginal Gyrus, LR Anterior, Posterior Cerebellum, LR Insula, LR Superior, Middle Temporal Pole, LR Rolandic Operculum, LR Lingual Gyrus, LR Thalamus, LR Caudate Nucleus, LR Putamen, LR Calcarine Sulcus, LR Gyrus Rectus, LR Hippocampus, LR Parahippocampal Gyrus, LR Cuneus, LR Heschl’s Gyrus, Vermis, LR Olfactory Cortex, LR Pallidum, LR Paracentral Lobule, LR Superior Temporal Sulcus, LR Temporo-Parietal Junction | -65 -29 -15 18.11 <0.001 1273847 |
|           | R Postcentral Gyrus, R Superior Parietal Gyrus, R Precentral Gyrus       | 17 -35 89 6.78 0.001 1499 |
|           | L Superior Parietal Gyrus, L Precuneus, L Postcentral Gyrus              | -14 -57 83 6.17 0.006 628 |

Note. Increases or decreases in regional grey matter volumes in primiparous women between the pre-conception and the early postpartum session corrected for K10 of the early postpartum session. Statistics are extracted from one-sample t-tests performed within the framework of an SPM12 General Linear Model and are one-sided (as is standard in SPM). Results are reported at a statistical threshold of p<0.05 FWE-corrected. L = left, R = right.
Supplementary Table 69. Changes in grey matter volume across pregnancy (PRE to POST) corrected for the degree of stress during pregnancy

| Contrasts | Regions                                                                                           | MNI coordinates | \( T \)  | \( p \) (FWE-corrected) | Cluster Size (mm³) |
|-----------|---------------------------------------------------------------------------------------------------|------------------|--------|--------------------------|-------------------|
| Increases |                                                                                                   |                  |        |                          |                   |
| Decreases |                                                                                                   |                  |        |                          |                   |
|           | LR Superior, Middle, Inferior Frontal Gyrus, LR Superior Medial Frontal Cortex, LR Orbitofrontal | -63 -66 53       | 19.53  | <0.001                   | 928172            |
|           | Cortex, LR Superior, Inferior Temporal Gyrus, LR Precuneus, LR Superior, Inferior Parietal Gyrus, |                  |        |                          |                   |
|           | LR Anterior, Middle, Posterior Cingulate Cortex, LR Fusiform Gyrus, LR Precentral Gyrus, LR      |                  |        |                          |                   |
|           | Postcentral Gyrus, LR Superior, Middle Occipital Gyrus, L Inferior Occipital Gyrus, LR Angular    |                  |        |                          |                   |
|           | gyrus, LR Supplementary Motor Area, LR Supramarginal Gyrus, LR Anterior, Cerebellum, LR Insula,  |                  |        |                          |                   |
|           | LR Superior, Middle Temporal Pole, LR Rolandic Operculum, LR Lingual Gyrus, LR Thalamus, LR      |                  |        |                          |                   |
|           | Caudate Nucleus, LR Putamen, LR Calcarine Sulcus, LR Gyrus Rectus, LR Hippocampus, LR            |                  |        |                          |                   |
|           | Parahippocampal Gyrus, LR Cuneus, LR Heschl’s Gyrus, Vermis, LR Olfactory Cortex, LR Pallidum,  |                  |        |                          |                   |
|           | LR Paracentral Lobule, LR Superior Temporal Sulcus, LR Temporo-Parietal Junction                  |                  |        |                          |                   |
|           | Vermis, LR Anterior Cerebellum                                                                    | 3 -36           | 6.89   | 0.006                    | 270               |
|           | R Calcarine Sulcus                                                                                | 12 -36          | 6.61   | 0.010                    | 192               |
|           | L Posterior Cerebellum                                                                           | -11 -47         | 6.60   | 0.010                    | 186               |
|           | R Supramarginal Gyrus, R Postcentral Gyrus, R Rolandic Operculum                                  | 59 -17          | 6.54   | 0.011                    | 250               |
|           | L Inferior Temporal Gyrus                                                                         | -36 3           | 6.48   | 0.013                    | 216               |
|           | R Posterior Cerebellum                                                                           | 41 -30          | 6.36   | 0.017                    | 30                |
|           | L Anterior Cingulate Cortex                                                                       | -2 0            | 6.17   | 0.025                    | 81                |
|           | R Posterior Cerebellum                                                                           | 41 -84          | 6.06   | 0.031                    | 34                |

**Note.** Increases or decreases in regional grey matter volumes in primiparous women between the pre-conception and the early postpartum session corrected for subjective degree of stress during pregnancy. Statistics are extracted from one-sample t-tests performed within the framework of an SPM12 General Linear Model and are one-sided (as is standard in SPM). Results are reported at a statistical threshold of \( p<0.05 \) FWE-corrected. L = left, R = right.
Supplementary Table 70. Changes in grey matter volume across pregnancy (PRE to POST) corrected for the degree of stress since birth

| Contrasts   | Regions                                                                                                           | MNI coordinates | T   | p (FWE-corrected) | Cluster Size (mm$^3$) |
|-------------|-------------------------------------------------------------------------------------------------------------------|-----------------|-----|-------------------|-----------------------|
| Increases   |                                                                                                                  |                 |     |                   |                       |
| Decreases   | LR Superior, Middle, Inferior Frontal Gyrus, LR Superior Medial Frontal Cortex, LR Orbitofrontal Cortex, LR Superior, Middle, Inferior Temporal Gyrus, LR Precuneus, LR Superior, Inferior Parietal Gyrus, LR Anterior, Middle, Posterior Cingulate Cortex, LR Fusiform Gyrus, LR Precentral Gyrus, LR Postcentral Gyrus, LR Superior, Middle Occipital Gyrus, L Inferior Occipital Gyrus, LR Angular gyrus, LR Supplementary Motor Area, LR Supramarginal Gyrus, LR Anterior, Posterior Cerebellum, LR Insula, LR Superior, Middle Temporal Pole, LR Rolandic Operculum, LR Lingual Gyrus, LR Thalamus, LR Caudate Nucleus, LR Putamen, LR Calcarine Sulcus, LR Gyrus Rectus, LR Hippocampus, LR Parahippocampal Gyrus, LR Cuneus, LR Heschl’s Gyrus, Vermis, LR Olfactory Cortex, LR Pallidum, LR Paracentral Lobule, LR Superior Temporal Sulcus, LR Temporo-Parietal Junction | -63 -42 -20     | 19.16 | <0.001             | 923400                |
|             | L Posterior Cerebellum                                                                                           | -36 -86 -47     | 6.64 | 0.009             | 196                   |
|             | Vermis                                                                                                            | 3 -47 -14       | 6.60 | 0.010             | 155                   |
|             | R Calcarine Sulcus                                                                                               | 12 -75 -14      | 6.57 | 0.011             | 189                   |
|             | R Supramarginal Gyrus, R Postcentral Gyrus                                                                      | 59 -17 -27      | 6.49 | 0.013             | 213                   |
|             | L Inferior Temporal Gyrus                                                                                         | -36 3 -39       | 6.38 | 0.016             | 179                   |
|             | R Posterior Cerebellum                                                                                           | 39 -30 -38      | 6.22 | 0.022             | 17                    |
|             | R Posterior Cerebellum                                                                                           | 41 -84 -48      | 6.05 | 0.031             | 41                    |

Note: Increases or decreases in regional grey matter volumes in primiparous women between the pre-conception and the early postpartum session corrected for the subjective degree of stress since birth. Statistics are extracted from one-sample t-tests performed within the framework of an SPM12 General Linear Model and are one-sided (as is standard in SPM). Results are reported at a statistical threshold of $p<0.05$ FWE-corrected. P-value at peak voxel (whole-brain FWE corrected) is reported. L = left, R = right.
Supplementary Table 71. Correlations between sleep quality and PRE to POST changes in grey matter volume.

| Measures                                                      | R   | p     |
|---------------------------------------------------------------|-----|-------|
| Average hours of sleep week preceding pregnancy session      | -.46| .965  |
| Average number of sleep disruptions week preceding pregnancy session | -.08| .521  |
| Average hours of sleep week preceding postpartum session     | .16 | .166  |
| Average number of sleep disruptions week preceding postpartum session | -.25| .831  |
| Indication of sleep quality (hours of sleep) across the first 36 weeks of pregnancy | -.04| .445  |
| Indication of sleep quality (sleep disruptions) across the first 36 weeks of pregnancy | .11 | .194  |
| Indication of sleep quality (hours of sleep) between delivery and the Post session | .04 | .319  |
| Indication of sleep quality (sleep disruptions) between delivery and the Post session | -.03| .436  |

*Note.* Correlation results between variables representing the women’s sleep quality during pregnancy and the postpartum period and the observed changes in grey matter volume. It should be noted that for these analyses the R cannot be interpreted as a reflection of the direction of the biological effect, since this statistic is based on patterns of brain changes across the whole brain.

Supplementary Table 72. Correlations between sleep quality and PRE to POST changes in DMN coherence.

| Measures                                                      | R (rho) | p (rho p) |
|---------------------------------------------------------------|---------|-----------|
| Average hours of sleep week preceding pregnancy session      | .071 (-0.006) | .683 (.971) |
| Average number of sleep disruptions week preceding pregnancy session | -.155 (-.228) | .374 (.188) |
| Average hours of sleep week preceding postpartum session     | -.202  | .212     |
| Average number of sleep disruptions week preceding postpartum session | -.075 (.010) | .647 (.951) |
| Indication of sleep quality (hours of sleep) across the first 36 weeks of pregnancy | -.092  | .601     |
| Indication of sleep quality (sleep disruptions) across the first 36 weeks of pregnancy | -.188 (-.232) | .280 (.179) |
| Indication of sleep quality (hours of sleep) between delivery and the Post session | -.102  | .560     |
| Indication of sleep quality (sleep disruptions) between delivery and the Post session | -.028 (.077) | .871 (.654) |

*Note.* Correlation results between variables representing the women’s sleep quality during pregnancy and the postpartum period and the observed changes in default mode network coherence. In case of deviations from normality, a non-parametric Spearman’s correlation test was performed rather than a Pearson’s test. Spearman’s rho (“rho”) and the p-values for this test (“p rho”) are then also reported in the table.

Supplementary Table 73. Changes in DMN across pregnancy (PRE to POST) corrected for hours of sleep in the week before the pregnancy session.

| Contrast     | Regions               | MNI coordinates | T   | P (FWE-corrected) | Cluster Size (mm³) |
|--------------|-----------------------|-----------------|-----|-------------------|-------------------|
| Increases    | L Cuneus, R Cuneus    | x: 6 y: -84 z: 18 | 6.32 | 0.001             | 216               |
| Decreases    | -                     |                 |     |                   |                   |

*Note.* Increases or decreases in within-network connectivity in the DMN in primiparous women between the preconception and the early postpartum session corrected for the average number of hours of sleep per night in the week before the pregnancy session. Results are reported at a statistical threshold of p<0.05 FWE-corrected. . L = left, R = right.
Supplementary Table 74. Changes in DMN across pregnancy (PRE to POST) corrected for hours of sleep in the week before the early postpartum session.

| Contrast | Regions               | MNI coordinates | T       | P (FWE-corrected) | Cluster Size (mm³) |
|----------|-----------------------|-----------------|---------|-------------------|--------------------|
|          |                       | x   y   z       |         |                   |                    |
| Increases| L Cuneus, R Cuneus   | 6   -84  18    | 5.59    | 0.005             | 135                |
| Decreases|                       |                 |         |                   |                    |

*Note.* Increases or decreases in within-network connectivity in the DMN in primiparous women between the pre-conception and the early postpartum session corrected for the average number of hours of sleep per night in the week before the early postpartum session. Results are reported at a statistical threshold of p<0.05 FWE-corrected. L = left, R = right.

Supplementary Table 75. Changes in DMN across pregnancy (PRE to POST) corrected for sleep disruptions in the week before the pregnancy session.

| Contrast | Regions               | MNI coordinates | T       | P (FWE-corrected) | Cluster Size (mm³) |
|----------|-----------------------|-----------------|---------|-------------------|--------------------|
|          |                       | x   y   z       |         |                   |                    |
| Increases| L Cuneus, R Cuneus   | 6   -84  18    | 6.31    | 0.001             | 216                |
| Decreases|                       |                 |         |                   |                    |

*Note.* Increases or decreases in within-network connectivity in the DMN in primiparous women between the pre-conception and the early postpartum session corrected for the average number of sleep disruptions per night in the week before the pregnancy session. Results are reported at a statistical threshold of p<0.05 FWE-corrected. L = left, R = right.

Supplementary Table 76. Changes in DMN across pregnancy (PRE to POST) corrected for sleep disruptions in the week before the early postpartum session.

| Contrast | Regions               | MNI coordinates | T       | P (FWE-corrected) | Cluster Size (mm³) |
|----------|-----------------------|-----------------|---------|-------------------|--------------------|
|          |                       | x   y   z       |         |                   |                    |
| Increases| L Cuneus, R Cuneus   | 6   -84  18    | 5.52    | 0.006             | 135                |
| Decreases|                       |                 |         |                   |                    |

*Note.* Increases or decreases in within-network connectivity in the DMN in primiparous women between the pre-conception and the early postpartum session corrected for the average number of sleep disruptions per night in the week before the early postpartum session. Results are reported at a statistical threshold of p<0.05 FWE-corrected. L = left, R = right.

Supplementary Table 77. Changes in DMN across pregnancy (PRE to POST) corrected for hours of sleep between birth and the early postpartum session.

| Contrast | Regions               | MNI coordinates | T       | P (FWE-corrected) | Cluster Size (mm³) |
|----------|-----------------------|-----------------|---------|-------------------|--------------------|
|          |                       | x   y   z       |         |                   |                    |
| Increases| L Cuneus, R Cuneus   | 6   -84  18    | 6.03    | 0.003             | 216                |
| Decreases|                       |                 |         |                   |                    |

*Note.* Increases or decreases in within-network connectivity in the DMN in primiparous women between the pre-conception and the early postpartum session corrected for the average number of hours of sleep per night between birth and the early postpartum session. Results are reported at a statistical threshold of p<0.05 FWE-corrected. L = left, R = right.
**Supplementary Table 78. Changes in DMN across pregnancy (PRE to POST) corrected for the average number of sleep disruptions per night between birth and the early postpartum session.**

| Contrast | Regions | MNI coordinates | T   | P (FWE-corrected) | Cluster Size (mm$^3$) |
|----------|---------|-----------------|-----|------------------|---------------------|
| Increases | L Cuneus, R Cuneus | $x$ $y$ $z$ | 5.96 | 0.003 | 216 |
| Decreases | - | | | | |

*Note.* Increases or decreases in within-network connectivity in the DMN in primiparous women between the pre-conception and the early postpartum session corrected for the average number of sleep disruptions per night between birth and the early postpartum session. Results are reported at a statistical threshold of p<0.05 FWE-corrected. L = left, R = right.

**Supplementary Table 79. Changes in grey matter volume across pregnancy (PRE to POST) corrected for hours sleep in the week before the pregnancy session.**

| Contrasts | Regions | MNI coordinates | T   | P (FWE-corrected) | Cluster Size (mm$^3$) |
|----------|---------|-----------------|-----|------------------|---------------------|
| Increases | - | | | | |
| Decreases | LR Superior, Middle, Inferior Frontal Gyrus, LR Superior Medial Frontal Cortex, LR Orbitofrontal Cortex, LR Superior, Middle, Inferior Temporal Gyrus, LR Precuneus, LR Superior, Inferior Parietal Gyrus, LR Anterior, Middle, Posterior Cingulate Cortex, LR Fusiform, LR Precentral Gyrus, LR Postcentral Gyrus, LR Superior, Middle, Inferior Occipital Gyrus, LR Angular gyrus, LR Supplementary Motor Area, LR Supramarginal Gyrus, LR Anterior, Posterior Cerebellum, LR Insula, LR Superior, Middle Temporal Pole, LR Rolandic Operculum, LR Lingual Gyrus, LR Thalamus, LR Caudate Nucleus, LR Putamen, LR Calcarine Sulcus, LR Gyrus Rectus, LR Hippocampus, LR Parahippocampal Gyrus, LR Cuneus, LR Heschl’s Gyrus, Vermis, LR Olfactory Cortex, LR Pallidum, LR Paracentral Lobule, LR Superior Temporal Sulcus, LR Temporo-Parietal Junction | $x$ $y$ $z$ | 18.56 | <0.001 | 1299375 |
| | R Postcentral Gyrus | 17 | -35 | 90 | 7.08 | 0.001 | 746 |
| | L Precuneus, L Superior Parietal Gyrus | -14 | -57 | 83 | 6.32 | 0.006 | 638 |
| | R Posterior Cerebellum | 44 | -87 | -47 | 6.17 | 0.009 | 338 |
| | R Postcentral Gyrus, R Superior Parietal Gyrus | 18 | -50 | 80 | 5.99 | 0.014 | 189 |
| | R Posterior Cerebellum | 60 | -66 | -45 | 5.92 | 0.016 | 74 |

*Note.* Increases or decreases in regional grey matter volumes in primiparous women between the pre-conception and the early postpartum session corrected for the average number of hours of sleep per night in the week before the pregnancy session. Statistics are extracted from one-sample t-tests performed within the framework of an SPM12 General Linear Model and are one-sided (as is standard in SPM). Results are reported at a statistical threshold of p<0.05 FWE-corrected. P-value at peak voxel (whole-brain FWE corrected) is reported. L = left, R = right.
**Supplementary Table 80. Changes in grey matter volume across pregnancy (PRE to POST) corrected for hours sleep in the week before the early postpartum session.**

| Contrasts | Regions                                                                 | MNI coordinates | T (FWE-corrected) | Cluster Size (mm³) |
|-----------|--------------------------------------------------------------------------|-----------------|-------------------|--------------------|
| Increases |                                                                          |                 |                   |                    |
| Decreases | LR Superior, Middle, Inferior Frontal Gyrus, LR Superior Medial Frontal Cortex, LR Orbitofrontal Cortex, LR Superior, Middle, Inferior Temporal Gyrus, LR Precuneus, LR Superior, Inferior Parietal Gyrus, LR Anterior, Middle, Posterior Cingulate Cortex, LR Fusiform, LR Precentral Gyrus, LR Postcentral Gyrus, LR Superior, Middle, Inferior Occipital Gyrus, LR Angular gyrus, LR Supplementary Motor Area, LR Supramarginal Gyrus, LR Anterior, Posterior Cerebellum, LR Insula, LR Superior, Middle Temporal Pole, LR Rolandic Operculum, LR Lingual Gyrus, LR Thalamus, LR Caudate Nucleus, LR Putamen, LR Calcarine Sulcus, LR Gyrus Rectus, LR Hippocampus, LR Parahippocampal Gyrus, LR Cuneus, LR Heschl’s Gyrus, Vermis, LR Olfactory Cortex, LR Pallidum, LR Paracentral Lobule, LR Superior Temporal Sulcus, LR Temporo-Parietal Junction | -65 -41 -17 | 18.56 | <0.001 | 1343770 |
|          |                                                                          | -65 -29 -15     | 17.91             | <0.001             |
|          |                                                                          | 63 -32 -15      | 16.17             | <0.001             |
|          | R Superior Parietal Gyrus, R Precentral Gyrus, R Postcentral Gyrus, R Paracentral Lobule | 17 -35 89       | 7.01              | 0.001              | 1755 |
|          | L Precuneus, L Superior Parietal Gyrus, L Postcentral Gyrus              | -14 -57 83      | 6.29              | 0.004              | 1158 |
|          | L Paracentral Lobule                                                    | -3 -15 86       | 5.81              | 0.013              | 341  |

*Note.* Increases or decreases in regional grey matter volumes in primiparous women between the pre-conception and the early postpartum session corrected for the average number of hours of sleep per night in the week before the early postpartum session. Statistics are extracted from one-sample t-tests performed within the framework of an SPM12 General Linear Model and are one-sided (as is standard in SPM). Results are reported at a statistical threshold of p<0.05 FWE-corrected. P-value at peak voxel (whole-brain FWE corrected) is reported. L = left, R = right.
Supplementary Table 81. Changes in grey matter volume across pregnancy (PRE to POST) corrected for sleep disruptions in the week before the pregnancy session.

| Contrasts | Regions                                                                 | MNI coordinates | $T$ (FWE-corrected) | Cluster Size (mm$^3$) |
|-----------|--------------------------------------------------------------------------|-----------------|---------------------|----------------------|
| Increases | -                                                                        |                 |                     |                      |
| Decreases | LR Superior, Middle, Inferior Frontal Gyrus, LR Superior Medial Frontal Cortex, LR Orbitofrontal Cortex, LR Superior, Middle, Inferior Temporal Gyrus, LR Precuneus, LR Superior, Inferior Parietal Gyrus, LR Anterior, Middle, Posterior Cingulate Cortex, LR Fusiform, LR Precentral Gyrus, LR Postcentral Gyrus, LR Superior, Middle, Inferior Occipital Gyrus, LR Angular gyrus, LR Supplementary Motor Area, LR Supramarginal Gyrus, LR Anterior, Posterior Cerebellum, LR Insula, LR Superior, Middle Temporal Pole, LR Rolandic Operculum, LR Lingual Gyrus, LR Thalamus, LR Caudate Nucleus, LR Putamen, LR Calcarine Sulcus, LR Gyrus Rectus, LR Hippocampus, LR Parahippocampal Gyrus, LR Cuneus, LR Heschl’s Gyrus, Vermis, LR Olfactory Cortex, LR Pallidum, LR Paracentral Lobule, LR Superior Temporal Sulcus, LR Temporo-Parietal Junction | -66 -27 -15   | 19.93 <0.001 | 1227214 |
|           | -63 -42 -18                                                             | 17.05 <0.001    |                     |                      |
|           | -36 26 -17                                                              | 16.28 <0.001    |                     |                      |
|           | R Postcentral Gyrus                                                     | 7.18 0.001      | 699                 |                      |
|           | L Precuneus, L Superior Parietal Gyrus                                   | -14 -57 83     | 6.38 0.005          | 786                 |
|           | R Postcentral Gyrus, R Superior Parietal Gyrus                           | 17 -50 81      | 6.25 0.007          | 304                 |
|           | R Posterior Cerebellum                                                  | 44 -86 -53     | 6.14 0.010          | 321                 |
|           | R Posterior Cerebellum                                                  | 60 -66 -45     | 5.85 0.019          | 182                 |

Note. Increases or decreases in regional grey matter volumes in primiparous women between the pre-conception and the early postpartum session corrected for the average number of sleep disruptions per night in the week before the pregnancy session. Statistics are extracted from one-sample t-tests performed within the framework of an SPM12 General Linear Model and are one-sided (as is standard in SPM). Results are reported at a statistical threshold of $p<0.05$ FWE-corrected. P-value at peak voxel (whole-brain FWE corrected) is reported. L = left, R = right.
Supplementary Table 82. Changes in grey matter volume across pregnancy (PRE to POST) corrected for sleep disruptions in the week before the early postpartum session.

| Contrasts | Regions | MNI coordinates | T (FWE-corrected) | Cluster Size (mm³) |
|-----------|---------|-----------------|-------------------|-------------------|
| Increases | -       | -               | -                 | -                 |
| Decreases | LR Superior, Middle, Inferior Frontal Gyrus, LR Superior Medial Frontal Cortex, LR Orbitofrontal Cortex, LR Superior, Middle, Inferior Temporal Gyrus, LR Precuneus, LR Superior, Inferior Parietal Gyrus, LR Anterior, Middle, Posterior Cingulate Cortex, LR Fusiform, LR Precentral Gyrus, LR Postcentral Gyrus, LR Superior, Middle, Inferior Occipital Gyrus, LR Angular gyrus, LR Supplementary Motor Area, LR Supramarginal Gyrus, LR Anterior, Posterior Cerebellum, LR Insula, LR Superior, Middle Temporal Pole, LR Rolandic Operculum, LR Lingual Gyrus, LR Thalamus, LR Caudate Nucleus, LR Putamen, LR Calcarine Sulcus, LR Gyrus Rectus, LR Hippocampus, LR Parahippocampal Gyrus, LR Cuneus, LR Heschl’s Gyrus, Vermis, LR Olfactory Cortex, LR Pallidum, LR Paracentral Lobule, LR Superior Temporal Sulcus, LR Temporo-Parietal Junction | | |
| | | x | y | z | | |
| | -65 | -29 | -15 | 18.77 | <0.001 | 1321907 |
| | -63 | -41 | -18 | 18.60 | <0.001 | 63 -32 -17 16.44 <0.001 |
| | 63 | -32 | -17 | 16.44 | <0.001 | |
| | R Superior Parietal Gyrus, R Precentral Gyrus, R Postcentral Gyrus, R Paracentral Lobule | 17 | -35 | 89 | 7.13 | <0.001 | 1944 |
| | L Precuneus, L Superior Parietal Gyrus, L Postcentral Gyrus | -14 | -57 | 83 | 6.28 | 0.004 | 1232 |
| | L Paracentral Lobule | -6 | -15 | 89 | 5.83 | 0.012 | 358 |
| | R Postcentral Gyrus | 72 | -6 | 30 | 5.44 | 0.033 | 4 |

Note. Increases or decreases in regional grey matter volumes in primiparous women between the pre-conception and the early postpartum session corrected for the average number of sleep disruptions per night in the week before the early postpartum session. Statistics are extracted from one-sample t-tests performed within the framework of an SPM12 General Linear Model and are one-sided (as is standard in SPM). Results are reported at a statistical threshold of p<0.05 FWE-corrected. P-value at peak voxel (whole-brain FWE corrected) is reported. L = left, R = right.
Supplementary Table 83. Changes in grey matter volume across pregnancy (PRE to POST) corrected for hours
sleep between birth and the early postpartum session.

| Contrasts   | Regions                                                                 | MNI coordinates | T     | p (FWE-corrected) | Cluster Size (mm³) |
|-------------|-------------------------------------------------------------------------|------------------|-------|-------------------|-------------------|
| Increases   |                                                                         |                  |       |                   |                   |
| Decreases   | LR Superior, Middle, Inferior Frontal Gyrus, LR Superior Medial Frontal Cortex, LR Orbitofrontal Cortex, LR Superior, Middle, Inferior Temporal Gyrus, LR Precuneus, LR Superior, Inferior Parietal Gyrus, LR Anterior, Middle, Posterior Cingulate Cortex, LR Fusiform, LR Precentral Gyrus, LR Postcentral Gyrus, LR Superior, Middle, Inferior Occipital Gyrus, LR Angular gyrus, LR Supplementary Motor Area, LR Supramarginal Gyrus, LR Anterior, Posterior Cerebellum, LR Insula, LR Superior, Middle Temporal Pole, LR Rolandic Operculum, LR Lingual Gyrus, LR Thalamus, LR Caudate Nucleus, LR Putamen, LR Calcarine Sulcus, LR Gyrus Rectus, LR Hippocampus, LR Parahippocampal Gyrus, LR Cuneus, LR Heschl’s Gyrus, Vermis, LR Olfactory Cortex, LR Pallidum, LR Paracentral Lobule, LR Superior Temporal Sulcus, LR Temporo-Parietal Junction | -63 -65 -36 -36 -29 -23 -18 -14 | 18.43  17.83  14.49 | <0.001 <0.001 <0.001 | 1162229 |
|             | R Postcentral Gyrus, R Superior Parietal Gyrus                           | -35 -48 -35 -48 -35 -35 -35 -35 | 7.29  6.04  5.65 | 0.001  0.012  0.031 | 604   132  27   |
|             | R Posterior Cerebellum                                                  | -90 -66 -66 -66 -66 -66 -66 -66 | 6.03  5.64  5.23 | 0.001  0.012  0.031 | 604   132  27   |

**Note.** Increases or decreases in regional grey matter volumes in primiparous women between the pre-conception and the early postpartum session corrected for the average number of hours of sleep per night between birth and the early postpartum session. Statistics are extracted from one-sample t-tests performed within the framework of an SPM12 General Linear Model and are one-sided (as is standard in SPM). Results are reported at a statistical threshold of p<0.05 FWE-corrected. P-value at peak voxel (whole-brain FWE corrected) is reported. L = left, R = right.
**Supplementary Table 84.** Changes in grey matter volume across pregnancy (PRE to POST) corrected for sleep disruptions between birth and the early postpartum session.

| Contrasts | Regions | MNI coordinates | T (FWE-corrected) | Cluster Size (mm³) |
|-----------|---------|-----------------|-------------------|-------------------|
| Increases | -       |                 |                   |                   |
| Decreases | LR Superior, Middle, Inferior Frontal Gyrus, LR Superior Medial Frontal Cortex, LR Orbitofrontal Cortex, LR Superior, Middle, Inferior Temporal Gyrus, LR Precuneus, LR Superior, Inferior Parietal Gyrus, LR Anterior, Middle, Posterior Cingulate Cortex, LR Fusiform, LR Precentral Gyrus, LR Postcentral Gyrus, LR Superior, Middle, Inferior Occipital Gyrus, LR Angular gyrus, LR Supplementary Motor Area, LR Supramarginal Gyrus, LR Anterior, Posterior Cerebellum, LR Insula, LR Superior, Middle Temporal Pole, LR Rolandic Operculum, LR Lingual Gyrus, LR Thalamus, LR Caudate Nucleus, LR Putamen, LR Calcarine Sulcus, LR Gyrus Rectus, LR Hippocampus, LR Parahippocampal Gyrus, LR Cuneus, LR Heschl’s Gyrus, Vermis, LR Olfactory Cortex, LR Pallidum, LR Paracentral Lobule, LR Superior Temporal Sulcus, LR Temporo-Parietal Junction | -63 -41 -18 19.07 <0.001 | 1182546 |
|           | R Postcentral Gyrus, R Superior Parietal Gyrus | 63 -32 -17 16.47 <0.001 | 1182546 |
| Decreases | R Posterior Cerebellum | -65 -27 -15 18.53 <0.001 | 1182546 |
| Decreases | L Precuneus, L Superior Parietal Gyrus | -63 -32 -17 16.47 <0.001 | 1182546 |
| Decreases | R Posterior Cerebellum | 63 -32 -17 16.47 <0.001 | 1182546 |
| Note. Increases or decreases in regional grey matter volumes in primiparous women between the pre-conception and the early postpartum session corrected for the average number of sleep disruptions per night between birth and the early postpartum session. Statistics are extracted from one-sample t-tests performed within the framework of an SPM12 General Linear Model and are one-sided (as is standard in SPM). Results are reported at a statistical threshold of p<0.05 FWE-corrected. P-value at peak voxel (whole-brain FWE corrected) is reported. L = left, R = right.

**Supplementary Table 85.** Correlation between duration exposure to postpartum factors and grey matter volume.

| Measures | R  | p   |
|----------|----|-----|
| Duration exposure postpartum factors | -.01 | .940 |

Note. Correlation results between variables representing the duration of exposure to postpartum factors and the observed changes in grey matter volume. It should be noted that for these analyses the R cannot be interpreted as a reflection of the direction of the biological effect, since this statistic is based on patterns of brain changes across the whole brain.

**Supplementary Table 86.** Correlation between duration exposure to postpartum factors and DMN coherence.

| Measures | R  | p   |
|----------|----|-----|
| Duration exposure postpartum factors | -.08 | .524 |

Note. Correlation results between variables representing the duration of exposure to postpartum factors and the observed changes in default mode network coherence.
Supplementary Table 87. Changes in grey matter volume (PRE to POST) corrected for time between birth and post session.

| Contrasts | Regions | MNI coordinates | T (FWE-corrected) | Cluster Size (mm³) |
|-----------|---------|-----------------|------------------|-------------------|
| Increase  | -       |                 |                  |                   |
| Decrease  | LR Superior, Middle, Inferior Frontal Gyrus, LR Superior Medial Frontal Cortex, LR Superior, Middle, Inferior Temporal Gyrus, LR Superior Temporal Sulcus, LR Temporal Pole, LR Precuneus, LR Anterior, Middle, Posterior Cingulate Cortex, LR Fusiform, LR Angular Gyrus, LR Supramarginal Gyrus, LR Temporo-Parietal Junction, LR Supplementary Motor Area, LR Anterior, Posterior Cerebellum, LR Insula, LR Orbitofrontal Cortex, LR Precentral Gyrus, LR Postcentral Gyrus, LR Putamen, LR Calcarine Sulcus, LR Gyrus Rectus, LR Hippocampus LR Thalamus, LR Parahippocampal Gyrus, LR Cuneus, LR Olfactory, Vermis, Pallidum, LR Paracentral Lobule, LR Superior, Middle, Inferior Occipital Gyrus, LR Superior, Inferior Parietal Lobule, LR Lingual Gyrus, LR Caudate | -62 -32 -12 | 21.07 <0.001 | 3461124 |
|           |         | -36 24 -10      | 18.33 <0.001     |                   |
|           |         | -28 10 54        | 17.76 <0.001     |                   |
|           | R Anterior Cerebellum | 42 -80 -48 | 6.17 0.032 | 9 |
|           | R Postcentral Gyrus, R Superior Parietal Lobule | 15 -33 82 | 6.17 0.033 | 11 |
|           |         | 18 -50 78        | 6.16 0.033       |                   |

*Note.* One sample t-test to explore the direction of change in grey matter volume in primiparous (PRG) participants across Pre and Post1 sessions, while adjusting for the days between birth and Post session. Statistics are extracted from one-sample t-tests performed within the framework of an SPM12 General Linear Model and are one-sided (as is standard in SPM). Results are reported at a statistical threshold of p<0.05 FWE-corrected. P-value at peak voxel (whole-brain FWE corrected) is reported. L = left, R = right.

Supplementary Table 88. Changes in DMN across pregnancy (PRE to POST) corrected for time between birth and post session.

| Contrast | Regions | MNI coordinates | T (FWE-corrected) | Cluster Size (mm³) |
|----------|---------|-----------------|------------------|-------------------|
| Increases | L Cuneus, R Cuneus | 9 -84 15 | 6.25 0.006 | 216 |
| Decreases | -       |                 |                  |                   |

*Note.* Increases or decreases in within-network connectivity in the DMN in primiparous women between the preconception and the early postpartum session corrected for the duration of exposure to postpartum factors (the number of days between birth and the post session). Results are reported at a statistical threshold of p<0.05 FWE-corrected. L = left, R = right.

Supplementary Table 89. Correlation between breastfeeding and PRE to POST changes in grey matter volume.

| Measures                  | R    | p      |
|---------------------------|------|--------|
| Number of feedings per 24 hours | -.32 | .819   |
Note. Correlation results between the number of feedings per 24 hours in the women who breastfed their children and the observed changes in grey matter volume. It should be noted that for these analyses the R cannot be interpreted as a reflection of the direction of the biological effect, since this statistic is based on patterns of brain changes across the whole brain.

Supplementary Table 90. Correlation between breastfeeding and PRE to POST changes in DMN coherence.

| Measures            | R (rho)     | P (rho p)   |
|---------------------|-------------|-------------|
| Number of feedings per 24 hours | -.054 (-.060) | .775 (.755) |

Note. Correlation results between the number of feedings per 24 hours in the women who breastfed their children and the observed changes default mode network coherence. In case of deviations from normality, a non-parametric Spearman’s correlation test was performed rather than a Pearson’s test. Spearman’s rho (“rho”) and the p-values for this test (“p rho”) are then also reported in the table.

Supplementary Table 91. Changes in grey matter volume across pregnancy (PRE to POST) corrected for the number of feedings per 24 hours in breastfeeding mothers.

| Contrasts | Regions                                                                 |
|-----------|------------------------------------------------------------------------|
| Increases | -                                                                      |
| Decreases | LR Superior, Middle, Inferior Frontal Gyrus, LR                         |
|           | Superior Medial Frontal Cortex, LR Orbitofrontal Cortex, LR Superior, Inferior |
|           | Parietal Gyrus, LR Anterior, Middle, Posterior Cingulate Cortex, LR Fusiform Gyrus, LR |
|           | Precuneus, LR Superior, Inferior Parietal Gyrus, LR Anterior, Middle, Posterior Cingulate Cortex, LF Fusiform Gyrus, LF |
|           | Angular gyrus, LR Supplementary Motor Area, LR Superior, Inferior Parietal Gyrus, LR Anterior, Middle, Posterior Cingulate Cortex, LF Fusiform Gyrus, LF |
|           | Supramarginal Gyrus, LR Anterior, Posterior Cerebellum, LR Insula, LR Superior, Inferior Parietal Gyrus, LR Anterior, Middle, Posterior Cingulate Cortex, LF Fusiform Gyrus, LF |
|           | Temporal Pole, LR Rolandic Operculum, LR                               |
|           | Lingual Gyrus, LR Thalamus, LR Caudate Nucleus, LR Putamen, LR Calcarine Sulcus, LR |
|           | Gyrus Rectus, LR Hippocampus, LR                                        |
|           | Parahippocampal Gyrus, LR Cuneus, LR Heschl’s Gyrus, LR Vermis, LR Olfactory Cortex, LR Pallidum, LR Paracentral Lobule, LR Superior Temporal Sulcus, LR Temporo-Parietal Junction |
|           | R Postcentral Gyrus 17 -35 90 6.71 0.005 365                            |
|           | Vermis 2 -45 -17 5.94 0.027 152                                         |
|           | R Posterior Cerebellum 38 -30 -36 5.93 0.028 34                         |
|           | R Posterior Cerebellum 39 -30 -39 5.67 0.049 4                           |

Note. Changes in regional grey matter volumes in primiparous women between the pre-conception and the early postpartum session corrected for the number of feedings per 24 hours in breastfeeding women. Statistics are extracted from one-sample t-tests performed within the framework of an SPM12 General Linear Model and are one-sided (as is standard in SPM). Results are reported at a statistical threshold of p<0.05 FWE-corrected. P-value at peak voxel (whole-brain FWE corrected) is reported. L = left, R = right.
Supplementary Table 92. Changes in DMN across pregnancy (PRE to POST) corrected for the number of feedings per day.

| Contrast | Regions               | MNI coordinates | T      | P (FWE-corrected) | Cluster Size (mm$^3$) |
|----------|-----------------------|-----------------|--------|-------------------|----------------------|
| Increases| L Cuneus, R Cuneus    | 6 -84 18        | 5.96   | 0.006             | 189                  |
| Decreases| -                     |                 |        |                   |                      |

Changes in within-network connectivity in the DMN in primiparous women between the Pre and Post sessions corrected for the number of feedings per day in women breastfeeding their infants. Results are reported at a statistical threshold of p<0.05 FWE-corrected. L = left, R = right.

Supplementary Table 93. Correlation between breastfeeding and grey matter volume changes across postpartum period (POST to POST+1y).

| Measures                              | R   | p   |
|---------------------------------------|-----|-----|
| Total months of breastfeeding          | .06 | .264|

Note. Correlation results between the total number of months of breastfeeding until the Post+1yr session and the observed changes in grey matter volume across the postpartum period (between Post and Post+1yr sessions). It should be noted that for these analyses the R cannot be interpreted as a reflection of the direction of the biological effect, since this statistic is based on patterns of brain changes across the whole brain.

Supplementary Table 94. Correlation between breastfeeding and DMN coherence changes across postpartum period (POST to POST+1y).

| Measures                              | R   | p   |
|---------------------------------------|-----|-----|
| Total months of breastfeeding          | .48 | .022|

Note. Correlation results between the total number of months of breastfeeding until the Post+1yr session and the observed changes in default mode network coherence across the postpartum period (between Post and Post+1yr sessions).
## Supplementary Table 95. Demographics Table

| Characteristic                          | PRG            | CTR            | Between Group Differences |
|-----------------------------------------|----------------|----------------|---------------------------|
| Sample Size                             | 40             | 40             |                           |
| Age at Pre (M ± SD years)               | 29.35 ± 3.51   | 29.33 ± 3.57   | t = 0.032, p = 0.975      |
| Education (M Verhagen Score ± SD)       | 6.43 ± 0.78    | 6.65 ± 0.53    | t = -1.505, p = 0.137     |
| Secondary school                        | 0              | 0              |                           |
| College                                 | 19             | 12             |                           |
| University                              | 21             | 28             |                           |
| Duration Pre-Post (M ± SD days)         | 509.78 ± 158.91| 457.95 ± 81.95| t = 1.833, p = 0.072      |
| Duration without the 3 subjects with    | 480.32 ± 124.29| 457.95 ± 81.95| t = .925, p = 0.359       |
| delayed session (M ± SD days)           |                |                |                           |
| Natural Conception                      | 37             | -              |                           |
| Assisted Conception                     | 3              | -              |                           |
| Vaginal Birth                           | 31             | -              |                           |
| Caesarean section                       | 9              | -              |                           |
| Breastfeeding                           | 30             | -              |                           |
| Formula Feeding                         | 10             | -              |                           |
| Twins                                   | 1              | -              |                           |
| Medical history                         |                |                |                           |
| Depression/anxiety                      | 3              | 5              |                           |
| Eating Disorder                         | 1              |                |                           |
| ADHD                                    |                |                |                           |
| Harlequin Syndrome                      |                |                |                           |
| Trigeminal neuralgia                    |                |                |                           |
| Meningitis                              |                |                |                           |
| Burnout                                 |                |                |                           |

*Note. Demographic information of the sample and between-group differences. PRG = nulliparous women who were pregnant between sessions, CTR = nulliparous women who were not pregnant between sessions.*

## Supplementary Table 96. Correlation between age, scan interval and educational level with PRE to POST changes in DMN coherence.

| Measure                      | R     | P     |
|------------------------------|-------|-------|
| Age                          | .06   | .715  |
| Time interval between scans  | -.063 | .699  |
| Educational level (Verhagen) | .023  | .888  |

*Note. Correlation results between age (at Pre session), the time interval between the pre-conception and post-pregnancy scans and the educational level according to the Verhagen scale and the observed changes in default mode network coherence.*
Supplementary Table 97. Correlation between age, scan interval and educational level with PRE to POST changes in grey matter volume.

| Measure                              | R   | p    |
|--------------------------------------|-----|------|
| Age                                  | .16 | .144 |
| Time interval between scans          | -.08| .516 |
| Educational level (Verhagen)         | -.06| .472 |

*Note. Correlation results between age (at Pre session), the time interval between the pre-conception and post-pregnancy scans and the educational level according to the Verhagen scale and the observed changes in grey matter volume based on multivariate regression analyses. It should be noted that for these analyses the R cannot be interpreted as a direct reflection of the direction of the biological effect, since this statistic is based on patterns of brain changes across the whole brain.

Supplementary Figure 11. Positions of the VOIs used during the Magnetic Resonance Spectroscopy acquisitions. These depict the PCC VOI (a, in yellow) and the STG VOI (b, in blue) of a representable subject at the baseline session, shown in subject T1 space. VOI = Volume of Interest, PCC = Posterior Cingulate Cortex, STG = Superior Temporal Gyrus.

Supplementary Figure 12. Position of the PCC VOI used during the Magnetic Resonance Spectroscopy acquisitions. These images depict the VOI of a representable subject at the baseline session, shown in MNI space. The position of this VOI is at the mean center-of-gravity of all VOIs (x=0 mm, y=-57 mm, z=38 mm). I= Inferior, S=Superior, L=Left, R=Right, A=Anterior, P=Posterior, VOI = Volume of Interest, PCC = Posterior Cingulate Cortex.
Supplementary Table 98. Networks based on spatial sorting.

| Neural network               | R values |
|-----------------------------|----------|
| Visual network 1            | 0.781    |
| Visual network 2            | 0.524    |
| Visual network 3            | 0.705    |
| Sensorimotor network        | 0.665    |
| Default mode network        | 0.591    |
| Perception/pain network     | 0.608    |
| Auditory network            | 0.702    |
| Cognition/language network  | 0.671    |
| Cerebellum network          | 0.415    |
| Executive control network   | 0.464    |

Note. Overview of the networks derived from spatial sorting by using the components of Smith et al. and their respective R values.
Supplementary Figure 13. Illustration of resting state neural networks. The depicted networks represent the visual network 1 (a), visual network 2 (b), visual network 3 (c), default mode network (d), cerebellar network (e), sensorimotor network (f), auditory network (g), executive function network (h), frontoparietal network 1 (i), frontoparietal network 2 (j) based on the components of Smith et al.³.
Supplementary Figure 14. Mean levels of estradiol across pregnancy. Estradiol levels (pg/ml) divided by creatinine (mg/dl) to correct for urine concentration are depicted (M±SEM). Levels were extracted from first-morning urine samples available from 30 women in week 8 (N=30), 31 women in week 12 (N=31), 33 women in week 16 (N=33), 34 women in week 20 (N=34), 36 women in week 24 (N=36), 37 women in week 28 (N=37), 33 women in week 32 (N=33), 34 women in week 36 (N=34), 26 women in week 38 (N=26) and 8 women in week 40 of pregnancy (N=8) by means of a high throughput liquid chromatography–tandem mass spectrometry assay. Wk=week.

Supplementary Figure 15. Mean levels of estriol across pregnancy. Estriol levels (pg/ml) divided by creatinine (mg/dl) to correct for urine concentration are depicted (M±SEM). Levels were extracted from first-morning urine samples available from 29 women in week 8 (N=29), 32 women in week 12 (N=32), 34 women in week 16 (N=34), 35 women in week 20 (N=35), 36 women in week 24 (N=36), 37 women in week 28 (N=37), 33 women in week 32 (N=33), 34 women in week 36 (N=34), 26 women in week 38 (N=26) and 9 women in week 40 of pregnancy (N=9) by means of a high throughput liquid chromatography–tandem mass spectrometry assay. Wk=week.

Supplementary Figure 16. Mean levels of progesterone across pregnancy. Progesterone levels (pg/ml) divided by creatinine (mg/dl) to correct for urine concentration are depicted (M±SEM). Levels were extracted from first-morning urine samples available from 30 women in week 8 (N=30), 33 women in week 12 (N=33), 34 women in week 16 (N=34), 35 women in week 20 (N=35), 36 women in week 24 (N=36), 37 women in week 28 (N=37), 32 women in week 32 (N=32), 34 women in week 36 (N=34), 26 women in week 38 (N=26) and 9 women in week 40.
of pregnancy (N=9) by means of a high throughput liquid chromatography–tandem mass spectrometry assay. Wk=week.

Supplementary Figure 17. Mean levels of cortisol across pregnancy. Cortisol levels (nmol/l) divided by creatinine (mg/dl) to correct for urine concentration are depicted (M±SEM). Levels were extracted from first-morning urine samples available from 30 women in week 8 (N=30), 33 women in week 12 (N=33), 34 women in week 16 (N=34), 35 women in week 20 (N=35), 36 women in week 24 (N=36), 37 women in week 28 (N=37), 33 women in week 32 (N=33), 34 women in week 36 (N=34), 26 women in week 38 (N=26) and 9 women in week 40 of pregnancy (N=9) by means of a high throughput liquid chromatography–tandem mass spectrometry assay. Wk=week.

Supplementary References

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