Supplementary Table 1: Individual participant trauma details for both sham and cervical non-invasive vagal nerve stimulation (nVNS) groups. Number of distinct traumatic experiences are also presented. It was possible for a trauma to be present in multiple traumatic scripts or a script to contain multiple traumatic experiences.

| Participant | Sham or nVNS | Trauma Classification (s)                                                                 | Number of Distinct |
|-------------|--------------|------------------------------------------------------------------------------------------|--------------------|
| 1           | nVNS         | Death of parent; Loss of job; unfaithful spouse; failed relationship; emotional neglect (n = 3); molested; work-related stress | 9                  |
| 2           | nVNS         | Seeing ghosts; Observed death of others; Work-related stress                              | 3                  |
| 3           | nVNS         | Death of parent; Molested                                                                | 2                  |
| 4           | nVNS         | Observed death of workplace customer                                                      | 1                  |
| 5           | nVNS         | Observed serious injury to others (n = 2)                                                | 2                  |
| 6           | nVNS         | House Fire; Near Car Accident                                                            | 2                  |
| 7           | nVNS         | Attempted suicide and emotional abuse related to serious illness of parent                | 1                  |
| 8           | nVNS         | Physical Assault, Car Accident                                                           | 2                  |
| 9           | nVNS         | Robbery, Attempted abduction of family member                                             | 2                  |
| 10          | nVNS         | Car Accident, Threatened by strangers                                                    | 4                  |
| 11          | nVNS         | Death of family member                                                                  | 2                  |
| 1           | Sham         | Observed seriously injury to others; Molested                                            | 2                  |
| 2           | Sham         | Personal Injury, Near Car Accident                                                       | 2                  |
| 3a          | Sham         |                                                                                         |                    |
| 4           | Sham         | Robbery, Victim of Assault                                                               | 2                  |
| 5           | Sham         | Sexual Abuse                                                                             | 1                  |
| 6           | Sham         | Embarrassed by Peer                                                                      | 1                  |
| 7           | Sham         | Molested; Relationship Failed                                                             | 2                  |
| 8           | Sham         | Sexual Abuse                                                                             | 2                  |

*a content of script lost due to technical error*
**Supplementary Table 2**: Brain areas with significantly (p < 0.0025) greater activity during the first (TSB1), second (TSB2), and third (TSB3) applications of sham stimulation during trauma as measured with positron emission tomography. Significant clusters are presented by size (number of voxels) and location (Brodmann area, cluster peak Talairach coordinates). Sub-cluster peaks are also identified. ND = no difference.

| Voxel Number | Brain Region                        | Brodmann Area | X  | Y  | Z  | Z Score |
|--------------|------------------------------------|---------------|----|----|----|---------|
| **Activation** |                                    |               |    |    |    |         |
| TSB2 > TSB1: ND |                                     |               |    |    |    |         |
| TSB3 > TSB2 | R Parietal Lobe, Postcentral Gyrus | 1             | 65 | -21| 38 | 5.29    |
|             | R Parietal Lobe, Inferior Lobule   | 40            | 67 | -29| 33 | 3.39    |
|             | R Caudate                          | 16            | 14 | 20 | 9  | 5.16    |
|             | L Frontal Lobe, Precentral Gyrus   | 18            | -57| 6  | 11 | 4.05    |
|             | L Posterior Cingulate              | 16            | -6 | -29| 45 | 3.73    |
|             | R Claustrum                        | 26            | 26 | 21 | 2  | 3.65    |
|             | L Frontal Lobe, Middle Gyrus       | 25            | -46| 51 | 8  | 3.49    |
|             | L Frontal Lobe, Inferior Gyrus     | 46            | -48| 43 | 11 | 3.36    |
|             | R Temporal Lobe, Superior Gyrus    | 16            | 57 | 4  | 0  | 3.42    |
|             | L Claustrum                        | 17            | -34| -13| 11 | 3.28    |
| **Deactivation** |                                   |               |    |    |    |         |
| TSB2 > TSB1: ND |                                 |               |    |    |    |         |
| TSB3 > TSB2 | L Occipital Lobe, Precuneus        | 27            | 31 | 0  | -65| 20 | 3.88    |
|             | R Cerebellum                       | 16            | 32 | -30| -24| 3.84    |
Supplementary Figure 1: Axial slices of significant (p < 0.0025) areas with greater activation and deactivation during the third (TSB3) compared to second (TSB2) period of exposure to individualized trauma scripts with sham non-invasive vagal nerve stimulation. Talairach x coordinates are presented to indicate slice location.