Supplementary Figure S1: Plots of the connectivity weighting factors (β-values) determined with SEM analysis for each participant, in relation to the pain ratings obtained for each run. Plots are shown for each connection with a significant correlation between β-values and pain ratings. Results are only shown for the period before the thermal stimulus was applied.
Supplementary Figure S2: Anatomical regions with connectivity values that are significantly correlated with pain ratings across 59 healthy participants, for the period preceding the application of a noxious heat stimulus. Source regions are shown in orange and target regions are shown in dark red. Value labels indicate the caudal-to-rostral position from the ponto-medullary junction (PMJ), in mm. Each frame shows a 1 mm thick axial slice in spatially normalized format. The highest signal regions (the brightest white) in each slice correspond with the cerebrospinal fluid (CSF).
Supplementary Figure S3: Anatomical regions with connectivity values that are significantly correlated with pain ratings across 59 healthy participants, for the period during the application of a noxious heat stimulus. Source regions are shown in orange and target regions are shown in dark red. Value labels indicate the caudal-to-rostral position from the ponto-medullary junction (PMJ), in mm. Each frame shows a 1 mm thick axial slice in spatially normalized format. The highest signal regions (the brightest white) in each slice correspond with the cerebrospinal fluid (CSF).
**Supplementary Figure S4:** Anatomical regions with connectivity values that are significantly correlated with pain ratings across 59 healthy participants, for the period after the application of a noxious heat stimulus. Source regions are shown in orange and target regions are shown in dark red. Value labels indicate the caudal-to-rostral position from the ponto-medullary junction (PMJ), in mm. Each frame shows a 1 mm thick axial slice in spatially normalized format. The highest signal regions (the brightest white) in each slice correspond with the cerebrospinal fluid (CSF).
Supplementary Figure S5: Bayesian Regression Results for all regions included in the SEM analysis, showing a) the median BOLD response patterns ($S_0$), b) the variation with pain ratings ($S_p$), and c) the variation with stimulation temperature ($S_t$). The vertical lines indicate the start and end of the stimulation periods. BOLD response patterns are shown as percent signal change from the average over time.