# Supplementary Material

**Table S1.** Summary of measures used in the study

|  | Mean | SD |
|---|---|---|
| DUKE Social Support (T1) | 50.90 | 6.926 |
| DUKE Social Support (T2) | 50.69 | 7.054 |
| CES-D 4 (T1) | 2.39 | 1.036 |
| CES-D 8 (T1) | 2.40 | 0.966 |
| CES-D 12 (T1) | 2.47 | 0.864 |
| CES-D 16 (T1) | 2.47 | 0.873 |
| CES-D 4 (T2) | 2.48 | 0.993 |
| CES-D 8 (T2) | 2.45 | 0.957 |
| CES-D 12 (T2) | 2.48 | 0.888 |
| CES-D 16 (T2) | 2.55 | 0.839 |
| PAR-PRO Social outside home (T1) | 4.40 | 1.037 |
| PAR-PRO Social inside home (T1) | 3.67 | 1.453 |
| PAR-PRO HOBBY (T1) | 3.29 | 1.521 |
| PAR-PRO RELIGIOUS (T1) | 3.27 | 1.521 |
| PAR-PRO Social outside home (T2) | 4.33 | 1.132 |
| PAR-PRO Social inside home (T2) | 3.81 | 1.326 |
| PAR-PRO HOBBY (T2) | 3.47 | 1.353 |
| PAR-PRO RELIGIOUS (T2) | 3.24 | 1.427 |
| FIM COMMUNICATION (T1) | 12.86 | 1.902 |
| FIM SOCIAL Cognition (T1) | 19.31 | 2.836 |
| FIM MOTOR (T1) | 73.95 | 17.921 |
| FIM COMMUNICATION (T2) | 13.00 | 1.867 |
| FIM SOCIAL Cognition (T2) | 19.44 | 2.823 |
| FIM MOTOR (T2) | 75.42 | 17.397 |

**Table S2.** Adjacency matrix of the T1 → T2 cross-lagged panel network

|     | P1   | P2   | P3   | P4   | C1    | C2   | C3   | C4    | F1   | F2   | F3   | S    |
|-----|------|------|------|------|-------|------|------|-------|------|------|------|------|
| P1  | 0.26 | 0    | 0.04 | 0    | 0.04  | 0    | 0    | 0     | 0    | 0    | 0    | 0    |
| P2  | 0    | 0.1  | 0    | 0.03 | 0.05  | 0    | 0    | 0     | 0    | 0    | 0    | 0    |
| P3  | 0.03 | 0.09 | 0.2  | 0.08 | 0.07  | 0    | 0.03 | 0.06  | 0    | 0    | 0    | 0.31 |
| P4  | 0    | 0.05 | 0.05 | 0.07 | -0.12 | 0    | 0    | 0.07  | 0    | 0    | 0    | 0    |
| C1  | 0    | 0.02 | 0    | 0    | 0.4   | 0.14 | 0.07 | 0.09  | 0    | 0    | 0    | 0.25 |
| C2  | 0    | 0    | 0.01 | 0    | 0.02  | 0.3  | 0.11 | -0.04 | 0    | 0    | 0    | 0    |
| C3  | 0.02 | 0    | 0.02 | 0.02 | 0.06  | 0.04 | 0.34 | -0.02 | 0    | 0    | 0    | 0.14 |
| C4  | 0    | 0.05 | 0.07 | 0.03 | 0.06  | 0    | 0    | 0.52  | 0.06 | 0.01 | 0.46 | 0.19 |
| F1  | 0.02 | 0    | 0    | 0    | 0.15  | 0    | 0    | 0     | 0.39 | 0.16 | 0    | 0    |
| F2  | 0.06 | 0.05 | 0.01 | 0.01 | -0.08 | 0    | 0    | 0     | 0.16 | 0.49 | 0.56 | 0    |
| F3  | 0    | 0    | 0    | 0    | -0.01 | 0.02 | 0    | 0     | 0.01 | 0.02 | 0.72 | 0    |
| S   | 0.01 | 0.02 | 0.01 | 0.02 | 0.01  | 0    | 0    | 0     | 0    | 0.01 | 0    | 0.54 |

Independent variables are in rows and dependent variables in columns. Autoregressive edges are in the diagonals. Full names of variables are present in Figure 1.
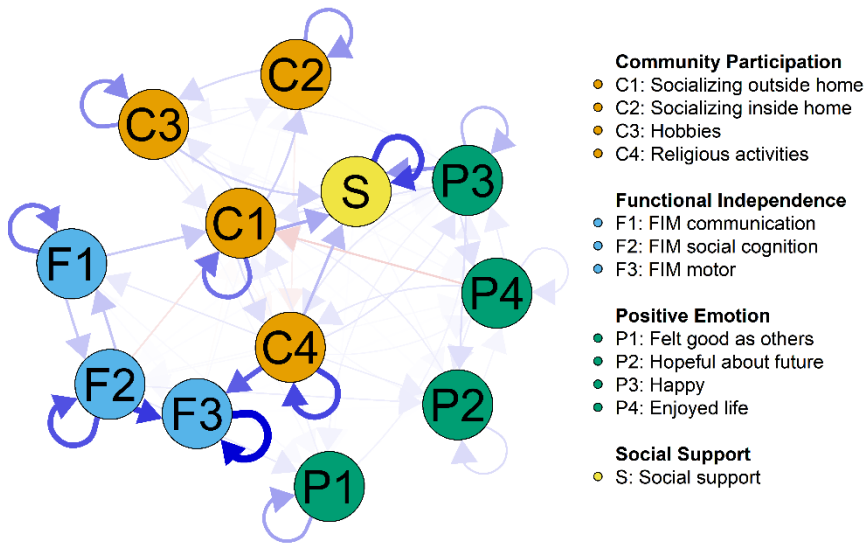
**Community Participation**
- C1: Socializing outside home
- C2: Socializing inside home
- C3: Hobbies
- C4: Religious activities

**Functional Independence**
- F1: FIM communication
- F2: FIM social cognition
- F3: FIM motor

**Positive Emotion**
- P1: Felt good as others
- P2: Hopeful about future
- P3: Happy
- P4: Enjoyed life

**Social Support**
- S: Social support

**Fig. S1.** CLPN of Persons with Stroke.

The plot includes both cross-lagged and auto-regressive edges.
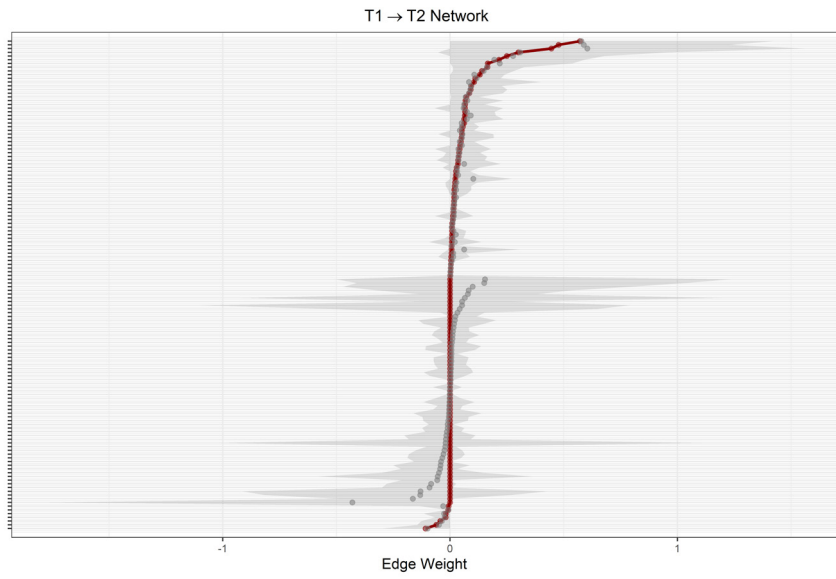
**T1 → T2 Network**

**Fig. S2.** Bootstrapped 95% confidence intervals

Edge weights (solid lines) and 95% confidence interval (grey bars) around the edge weights. Narrower CIs indicate more robust estimation of edge weights.
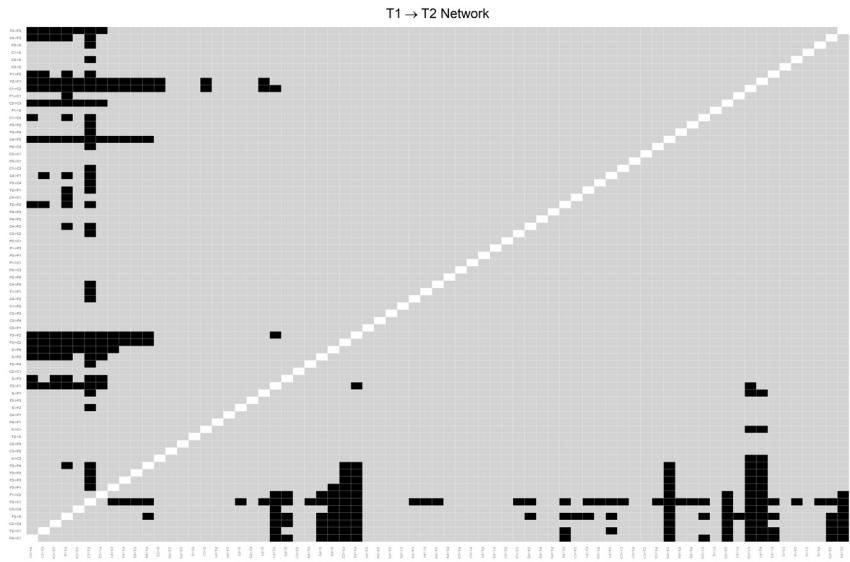
**Fig. S3.** Edge Weight Difference Test

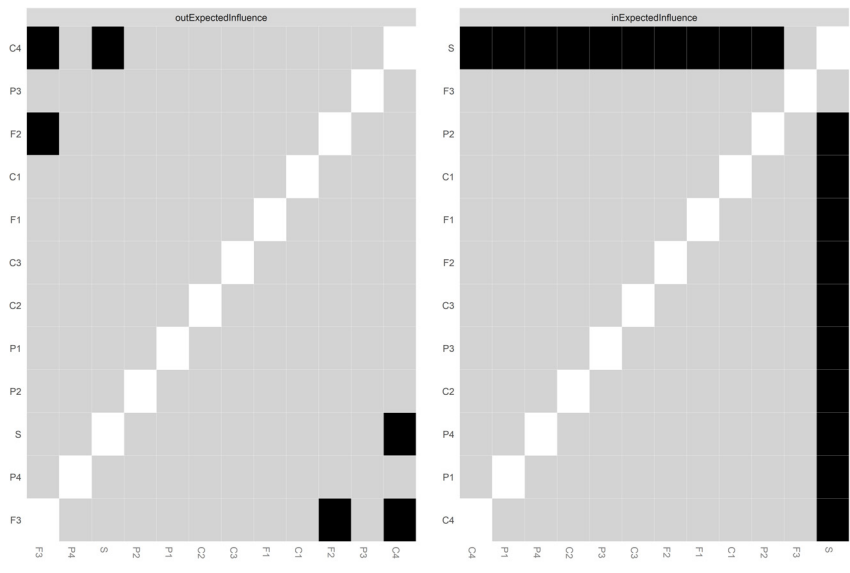Significant differences among edges are shown in black. Gray boxes indicate no difference.

**Fig. S4.** Centrality Difference Test

Gray boxes indicate no difference between nodes, whereas black boxes indicate significant difference (α = 0.05).

**Table S3.** Adjacency matrix of the T1 → T2 cross-lagged panel network for persons with aphasia

| | P1 | P2 | P3 | P4 | C1 | C2 | C3 | C4 | F1 | F2 | F3 | S |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P1 | 0.31 | 0 | 0 | 0 | 0.06 | 0 | 0 | 0 | 0 | 0 | 0 | -0.26 |
| P2 | 0 | 0.15 | 0.04 | 0.11 | 0.18 | 0 | 0 | 0 | 0 | 0 | 0.78 | 0 |
| P3 | 0 | 0.11 | 0.16 | 0.07 | 0.05 | 0 | 0 | 0.05 | -0.08 | -0.25 | -1.67 | 0.38 |
| P4 | 0 | 0.03 | 0.11 | 0 | -0.28 | 0 | 0 | 0.01 | 0 | 0.23 | 0 | 0 |
| C1 | 0 | 0 | 0 | 0 | 0.35 | 0.15 | 0.08 | 0.07 | 0 | 0.16 | 0 | 0.59 |
| C2 | -0.02 | 0 | 0 | 0 | 0 | 0.25 | 0.04 | 0 | -0.06 | -0.29 | 0 | 0.03 |
| C3 | 0 | 0.05 | 0 | 0.01 | 0.04 | 0 | 0.26 | 0 | -0.08 | -0.04 | 0 | 0.3 |
| C4 | 0 | 0.01 | 0.01 | 0 | 0.05 | 0.03 | 0 | 0.42 | 0.08 | 0 | 0.42 | 0 |
| F1 | 0.07 | 0.02 | 0 | 0 | 0.09 | 0 | 0 | 0 | 0.53 | 0.36 | 0.52 | 0 |
| F2 | 0.01 | 0 | 0 | 0 | -0.05 | 0 | 0 | 0 | 0.08 | 0.36 | 0 | 0 |
| F3 | 0 | 0 | 0 | 0 | -0.01 | 0.02 | 0 | 0 | 0.02 | 0.04 | 0.73 | -0.03 |
| S | 0.01 | 0.02 | 0.01 | 0.02 | 0.01 | 0 | 0.03 | 0 | 0.01 | 0.02 | 0 | 0.58 |

Independent variables are in rows and dependent variables in columns. Autoregressive edges are in the diagonals. Full names of variables are present in figures below.

**Table S4.** Adjacency matrix of the T1 → T2 cross-lagged panel network for persons without aphasia

|    | P1   | P2   | P3   | P4   | C1    | C2    | C3   | C4   | F1   | F2   | F3   | S    |
|----|------|------|------|------|-------|-------|------|------|------|------|------|------|
| P1 | 0.24 | 0    | 0.06 | 0    | 0.01  | 0     | 0    | 0    | 0.01 | 0    | 0.33 | 0.09 |
| P2 | 0    | 0.09 | 0    | 0    | 0     | 0     | 0    | 0    | 0    | 0    | 0    | 0    |
| P3 | 0.01 | 0.04 | 0.19 | 0.06 | 0.08  | -0.05 | 0.1  | 0    | 0    | 0    | 0    | 0.23 |
| P4 | 0.04 | 0.01 | 0    | 0.11 | 0     | 0     | 0    | 0.01 | 0    | 0    | 0    | 0    |
| C1 | 0    | 0.02 | 0    | 0    | 0.39  | 0.09  | 0    | 0    | 0    | 0    | 0    | 0    |
| C2 | 0.07 | 0.04 | 0.01 | 0    | 0.06  | 0.37  | 0.18 | 0    | 0.03 | 0    | 0.45 | 0    |
| C3 | 0.04 | 0    | 0.05 | 0    | 0.1   | 0.06  | 0.35 | 0    | 0    | 0    | 0    | 0    |
| C4 | 0.01 | 0.07 | 0.1  | 0.09 | 0.05  | 0     | 0    | 0.52 | 0.08 | 0.12 | 0.39 | 0.49 |
| F1 | 0.05 | 0    | 0.09 | 0.08 | 0.23  | 0     | 0    | 0    | 0.16 | 0.03 | 0    | 0.48 |
| F2 | 0.07 | 0.11 | 0    | 0    | -0.08 | 0     | 0    | 0    | 0.28 | 0.62 | 0.89 | 0    |
| F3 | 0    | 0    | 0    | 0    | -0.01 | 0.01  | 0    | 0    | 0    | 0.01 | 0.68 | 0    |
| S  | 0    | 0    | 0    | 0    | 0     | 0     | 0    | 0    | 0    | 0    | 0    | 0.48 |

Independent variables are in rows and dependent variables in columns. Autoregressive edges are in the diagonals. Full names of variables are present in figures below.
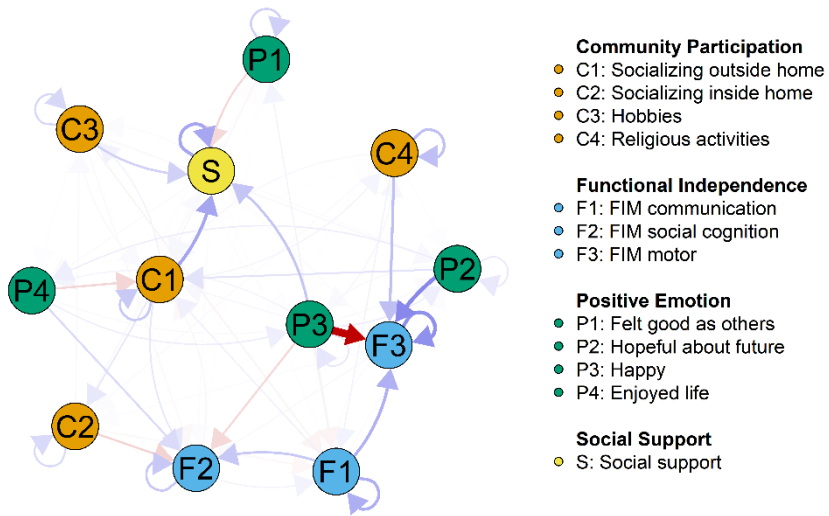
**Community Participation**
- C1: Socializing outside home
- C2: Socializing inside home
- C3: Hobbies
- C4: Religious activities

**Functional Independence**
- F1: FIM communication
- F2: FIM social cognition
- F3: FIM motor

**Positive Emotion**
- P1: Felt good as others
- P2: Hopeful about future
- P3: Happy
- P4: Enjoyed life

**Social Support**
- S: Social support

**Fig. S5.** CLPN of Persons with Aphasia

CLPN of persons with aphasia. Blue represents positive associations and red negative associations. Autoregressive edges are included.
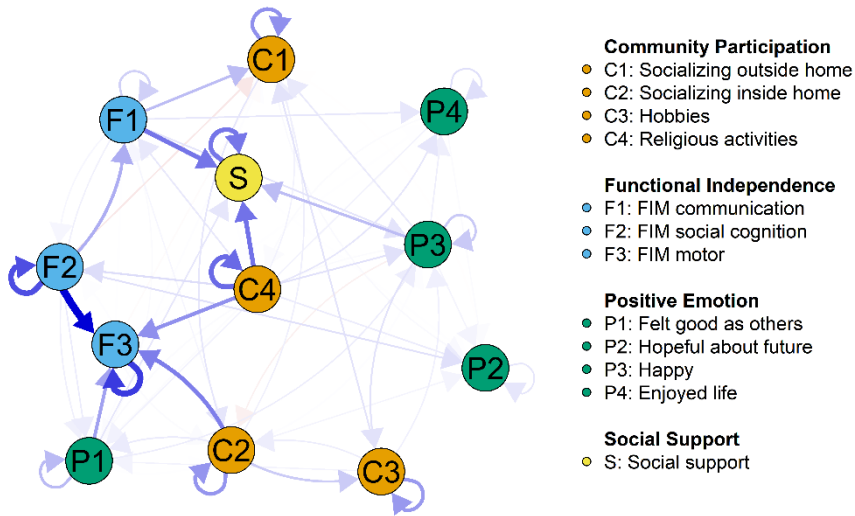
**Community Participation**
- C1: Socializing outside home
- C2: Socializing inside home
- C3: Hobbies
- C4: Religious activities

**Functional Independence**
- F1: FIM communication
- F2: FIM social cognition
- F3: FIM motor

**Positive Emotion**
- P1: Felt good as others
- P2: Hopeful about future
- P3: Happy
- P4: Enjoyed life

**Social Support**
- S: Social support

**Fig. S6.** CLPN of Persons with No Aphasia

CLPN of persons with aphasia. Blue represents positive associations and red negative associations. Autoregressive edges are included.