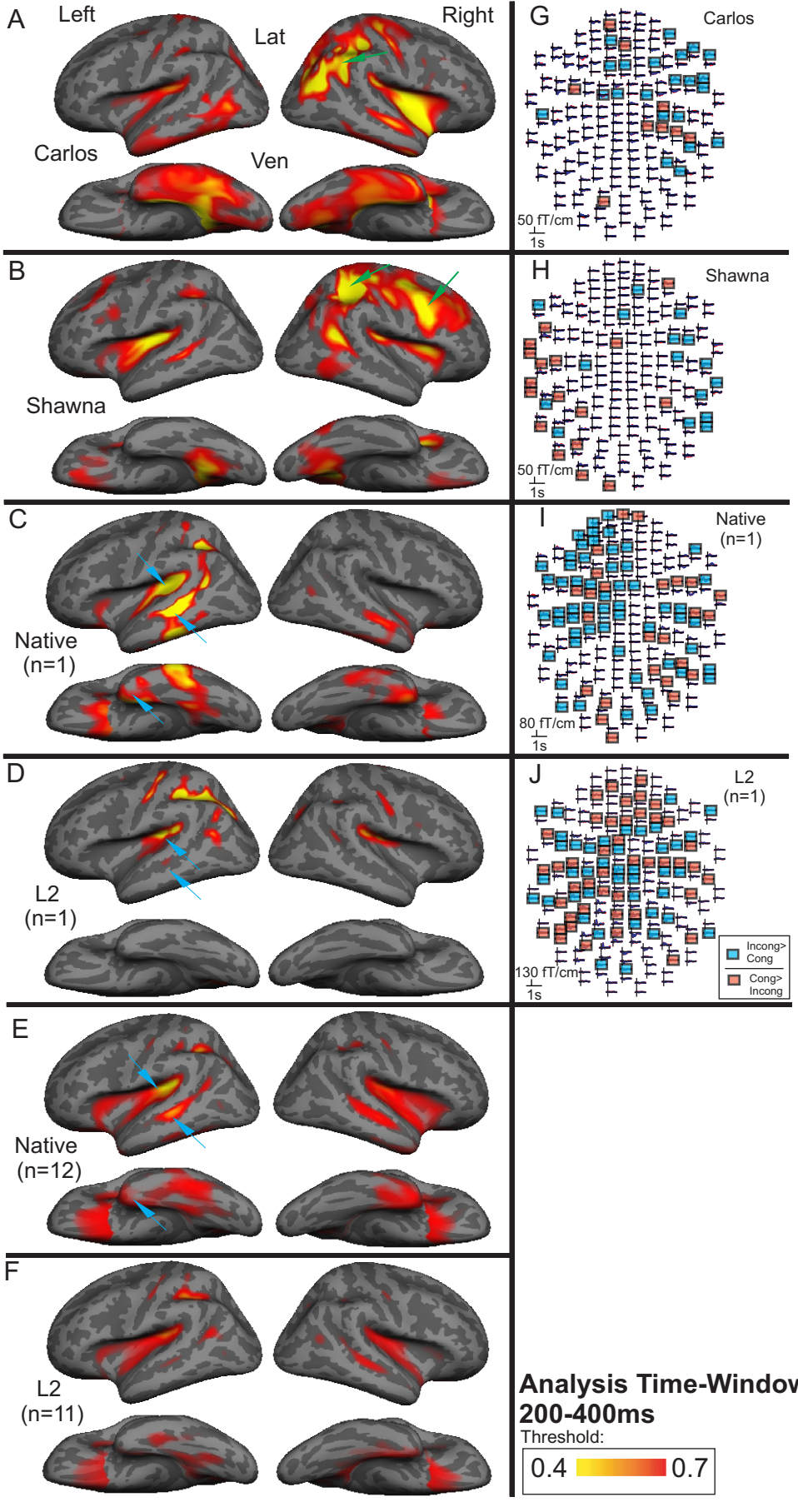
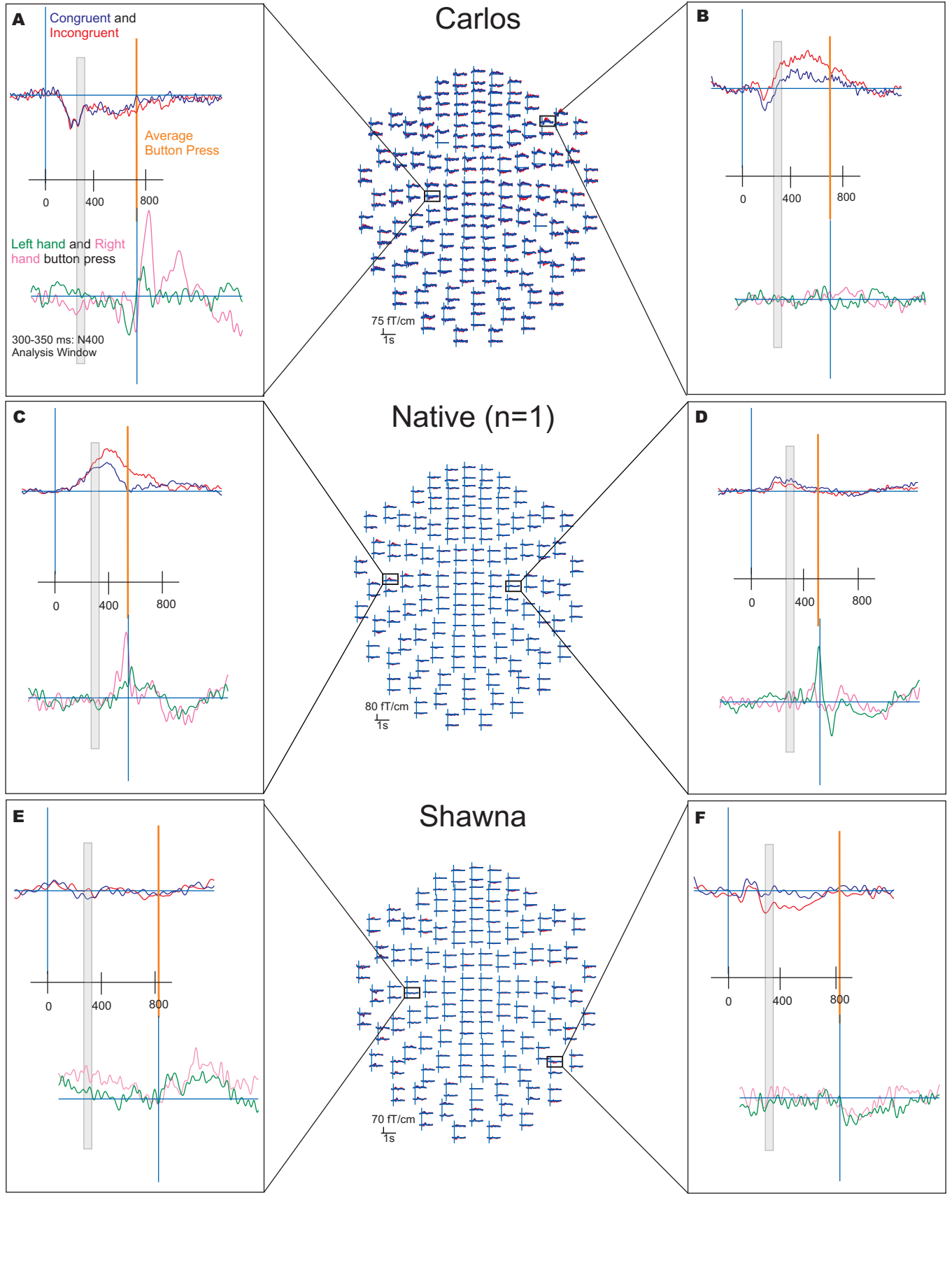
Fig S1: A-F: Contrasting semantic activation patterns to signs in cases who first experienced language at ~14yo, compared to a native and L2 signers in the 200-400 ms time-window. Like in the 300-350 ms time window (Figure 2), **(A)** Carlos and **(B)** Shawna show the strongest effect in right occipito-parietal cortex (green arrows). The two representative control participants **(panel C – native signer; panel D L2 signer)** show semantic effects in left fronto-temporal language areas. Similar activation patterns are observed at the group level **(panel E – native signers; panel F – L2 signers)**.

G-J: **Individual MEG sensor data in the 200-400 ms time-window.** Like in the 300-350 ms time-window (Figure 2), the cases lack a strong incongruent>congruent effect in left fronto-temporal regions. Blue channels: significant incongruent>congruent activity between 200-400ms, red channels: significant congruent>incongruent effects at the same time. **(E)** Carlos has the strongest incongruent>congruent effects in right hemisphere channels (blue channels); **(F)** Shawna also shows the most incongruent>congruent effects in right occipito-temporo-parietal channels (blue channels). In the cases, the semantic effect in left temporal cortex seen in panels A & B is mostly due to congruent>incongruent activity (red channels, panels G and H). **(I)** A native signer shows strong incongruent>congruent effects in left fronto-temporal channels (blue channels). **(J)** An L2 signer also shows predominantly left-lateralized semantic effects (blue channels). For more details on statistical procedure and subjects see Figure 2.

Figure S2: Neural responses to experimental task and motor control task. Selected channels are shown for Carlos and Shawna (panels A, B, E, & F) and a representative native signer (panels C & D). Panels B, C, and F show channels with large semantic congruity effects. The motor response to button press in these channels is either minimal (panels B and F), or occurs after the gray-shaded 300-350 ms time-window used in the N400 analyses (panel C). Conversely, panels A, D & E show channels with minimal semantic congruity effects but strong activity related to button press. Again, the MEG response to button press occurs well past the time window used in the N400 analyses. In the motor control task participants saw a grey dot on the screen and were asked to press a button when the dot changed its color to red. Each participant saw 120 trials, and responded 60 times with each hand. The motor control task was presented at the end of the MEG session, after the participants had completed the experimental blocks.


A
Left
Right
Lat
Carlos
Ven
B
Shawna
C
Native
(n=1)
D
L2
(n=1)
E
Native
(n=12)
F
L2
(n=11)
G
Carlos
50 fT/cm
1s
H
Shawna
50 fT/cm
1s
I
Native
(n=1)
80 fT/cm
1s
J
L2
(n=1)
130 fT/cm
1s
Incong>
Cong
Cong>
Incong
Analysis Time-Window:
200-400ms
Threshold:
0.4
0.7


A
Congruent and
Incongruent
Average
Button Press
0
400
800
Left hand and Right
hand button press
300-350 ms: N400
Analysis Window
Carlos
75 fT/cm
1s
B
0
400
800
C
0
400
800
Native (n=1)
80 fT/cm
1s
D
0
400
800
E
0
400
800
Shawna
70 fT/cm
1s
F
0
400
800