|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | | **Experiment 1** |  |  | **Experiment 2a** |  | **Experiment 3** |
| fROI | SProd vs. | SProd vs. | SProd vs. | SProd vs. | SProd vs. | SProd vs. | SProd vs. SProd vs. |
|  | fixation | N | VisEvSem | fixation | N | VisEvSem | fixation N |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| IFGorb | *d p* | = 4*.*042  *<* 0*.*001 | *d p* | = 3*.*069  *<* 0*.*001 | *d p* | = 5*.*665  *<* 0*.*001 | *d* = 1*.*835  *p* = 0*.*004 | *d* = 1*.*639  *p* = 0*.*033 | *d* = 1*.*122  *p* = 0*.*016 | *d p* | = 1*.*656  = 0*.*012 | *d p* | = 2*.*300  = 0*.*003 |
| IFG | *d p* | = 4*.*183  *<* 0*.*001 | *d p* | = 3*.*939  *<* 0*.*001 | *d p* | = 4*.*292  *<* 0*.*001 | *d* = 2*.*213  *p* = 0*.*001 | *d* = 2*.*082  *p* = 0*.*014 | *d* = 1*.*754  *p* = 0*.*016 | *d p* | = 2*.*449  = 0*.*001 | *d p* | = 2*.*452  = 0*.*003 |
| MFG | *d p* | = 3*.*409  *<* 0*.*001 | *d p* | = 2*.*777  *<* 0*.*001 | *d p* | = 3*.*892  *<* 0*.*001 | *d* = 2*.*545  *p <* 0*.*001 | *d* = 1*.*530  *p* = 0*.*033 | *d* = 1*.*184  *p* = 0*.*016 | *d p* | = 3*.*115  *<* 0*.*001 | *d p* | = 3*.*300  = 0*.*001 |
| AntTemp | *d p* | = 3*.*928  *<* 0*.*001 | *d p* | = 3*.*559  *<* 0*.*001 | *d p* | = 4*.*967  *<* 0*.*001 | *d* = 1*.*374  *p* = 0*.*019 | *d* = 1*.*161  *p* = 0*.*068 | *d* = 0*.*904  *p* = 0*.*035 | *d p* | = 2*.*105  = 0*.*003 | *d p* | = 2*.*519  = 0*.*003 |
| PostTemp | *d p* | = 4*.*391  *<* 0*.*001 | *d p* | = 3*.*561  *<* 0*.*001 | *d p* | = 4*.*785  *<* 0*.*001 | *d* = 2*.*251  *p* = 0*.*001 | *d* = 1*.*225  *p* = 0*.*068 | *d* = 1*.*072  *p* = 0*.*017 | *d p* | = 2*.*434  = 0*.*001 | *d p* | = 2*.*410  = 0*.*003 |
| AngG | *d p* | = 2*.*058  *<* 0*.*001 | *d p* | = 3*.*319  *<* 0*.*001 | *d p* | = 1*.*688  = 0*.*007 | *d* = 0*.*630  *p* = 0*.*128 | *d* = 0*.*928  *p* = 0*.*118 | *d* = 0*.*702  *p* = 0*.*228 | *d p* | = 1*.*393  = 0*.*025 | *d p* | = 1*.*575  = 0*.*003 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Language network** | *d p* | = 2*.*241  *<* 0*.*001 | *d p* | = 1*.*832  *<* 0*.*001 | *d p* | = 2*.*081  *<* 0*.*001 | *d* = 1*.*527  *p <* 0*.*001 | *d* = 1*.*054  *p <* 0*.*001 | *d* = 1*.*037  *p <* 0*.*001 | *d p* | = 1*.*731  *<* 0*.*001 | *d p* | = 1*.*587  *<* 0*.*001 |

Table 1: Q1: Does sentence production elicit a response in the language network?

*p* = 0*.*892

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Experiment 2b** | | | |
| fROI | SProd (typed) vs. fixation | SProd (typed) vs. N | SProd (typed) vs. VisEvSem | SProd (typed) vs. SProd |
|  |  |  |  |  |
| IFGorb | *d* = 1*.*507  *p* = 0*.*018 | *d* = 1*.*263  *p* = 0*.*121 | *d* = 1*.*603  *p* = 0*.*025 | *d* = 0*.*501  *p* = 0*.*383 |
| IFG | *d* = 1*.*771  *p* = 0*.*018 | *d* = 1*.*283  *p* = 0*.*121 | *d* = 1*.*650  *p* = 0*.*025 | *d* = 0*.*614  *p* = 0*.*346 |
| MFG | *d* = 1*.*494  *p* = 0*.*018 | *d* = 0*.*361  *p* = 0*.*631 | *d* = 1*.*492  *p* = 0*.*028 | *d* = 0*.*580  *p* = 0*.*333 |
| AntTemp | *d* = 0*.*561  *p* = 0*.*198 | *d* = 0*.*274  *p* = 0*.*631 | *d* = 0*.*326  *p* = 0*.*680 | *d* = 0*.*813  *p* = 0*.*333 |
| PostTemp | *d* = 1*.*443  *p* = 0*.*018 | *d* = 0*.*488  *p* = 0*.*631 | *d* = 1*.*764  *p* = 0*.*025 | *d* = 0*.*707  *p* = 0*.*337 |
| AngG | *d* = 0*.*015  *p* = 0*.*969 | *d* = 0*.*006  *p* = 0*.*992 | *d* = −0*.*077 | *d* = 1*.*216  *p* = 0*.*283 |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Language network** | *d p* | = 1*.*027  *<* 0*.*001 | *d p* | = 0*.*498  = 0*.*003 | *d p* | = 0*.*576  *<* 0*.*001 | *d* = 0*.*459  *p* = 0*.*006 |

Table 2: Q2: Does the language network’s response to sentence production generalize across output modality?

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| fROI | **Experiment 1**  WProd vs. SProd vs.  NProd WProd | **Experiment 2a**  WProd vs. SProd vs.  NProd WProd | **Experiment 2b**  WProd (typed) SProd (typed) vs. vs.  NProd (typed) WProd (typed) | **Experiment 3**  SProd vs. WProd |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| IFGorb | *d p* | = 0*.*184  = 0*.*736 | *d p* | = 2*.*503  *<* 0*.*001 | *d p*  *d p*  *d p*  *d p*  *d p*  *d p* | = 0*.*659  = 0*.*308  = 1*.*572  = 0*.*085  = 0*.*717  = 0*.*308  = −0*.*122  = 0*.*829  = 0*.*672  = 0*.*308  = 1*.*136  = 0*.*184 | *d p*  *d p*  *d p*  *d p*  *d p*  *d p* | = 1*.*321  = 0*.*081  = 0*.*290  = 0*.*610  = 0*.*497  = 0*.*464  = 1*.*264  = 0*.*081  = 1*.*044  = 0*.*124  = 1*.*943  = 0*.*023 | *d p* | = −0*.*150  = 0*.*825 | *d p* | = 2*.*966  *<* 0*.*001 | *d* = 2*.*727  *p* = 0*.*002 |
| IFG | *d p* | = 1*.*506  = 0*.*082 | *d p* | = 1*.*867  = 0*.*004 | *d* = −0*.*125  *p* = 0*.*825  *d* = 0*.*148  *p* = 0*.*825 | | *d* = 1*.*570  *p* = 0*.*014 | | *d* = 1*.*003  *p* = 0*.*124 |
| MFG | *d p* | = 1*.*064  = 0*.*133 | *d p* | = 1*.*628  = 0*.*009 | *d* = 1*.*942  *p* = 0*.*005 | | *d* = 1*.*158  *p* = 0*.*097 |
| AntTemp | *d p* | = 0*.*620  = 0*.*318 | *d p* | = 2*.*419  *<* 0*.*001 | *d* = −1*.*881  *p* = 0*.*029 | | *d* = 2*.*988  *p <* 0*.*001 | | *d* = 2*.*251  *p* = 0*.*005 |
| PostTemp | *d p* | = 0*.*771  = 0*.*257 | *d p* | = 3*.*795  *<* 0*.*001 | *d* = −0*.*831  *p* = 0*.*378 | | *d* = 3*.*693  *p <* 0*.*001 | | *d* = 2*.*816  *p* = 0*.*002 |
| AngG | *d p* | = 1*.*273  = 0*.*096 | *d p* | = 3*.*529  *<* 0*.*001 | *d* = −0*.*769  *p* = 0*.*378 | | *d* = 2*.*718  *p <* 0*.*001 | | *d* = 4*.*396  *p <* 0*.*001 |

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Language network** | *d* = 0*.*333  *p* = 0*.*037 | *d* = 0*.*668  *p <* 0*.*001 | *d p* | = 0*.*376  = 0*.*023 | *d p* | = 0*.*356  = 0*.*032 | *d p* | = −0*.*105  = 0*.*524 | *d p* | = 0*.*830  *<* 0*.*001 | *d* = 0*.*609  *p <* 0*.*001 |

Table 3: Q3: Does the language network respond to both lexical access and syntactic encoding?

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| fROI | **Experiment 1**  SProd vs. WProd | **Experiment 2a**  SProd vs. WProd | **Experiment 2b**  SProd vs. WProd | **Experiment 3**  SProd vs. WProd |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| LH PostParietal | *d* = −3*.*491 | *d* = −1*.*873 | *d* = −0*.*962  *p* = 0*.*354  *d* = −0*.*530  *p* = 0*.*594  *d* = −0*.*690  *p* = 0*.*483  *d* = −0*.*267  *p* = 0*.*769  *d* = −0*.*317  *p* = 0*.*769  *d* = −0*.*099  *p* = 0*.*906  *d* = −0*.*444  *p* = 0*.*673  *d* = 0*.*040  *p* = 0*.*943  *d* = 0*.*681  *p* = 0*.*483  *d* = 0*.*351  *p* = 0*.*769  *d* = −1*.*432  *p* = 0*.*223  *d* = −1*.*233  *p* = 0*.*223  *d* = −0*.*946  *p* = 0*.*354  *d* = −1*.*250  *p* = 0*.*223  *d* = −1*.*470  *p* = 0*.*223  *d* = −0*.*614  *p* = 0*.*524  *d* = −0*.*913  *p* = 0*.*354  *d* = −0*.*720  *p* = 0*.*483  *d* = −0*.*242  *p* = 0*.*769  *d* = 0*.*224  *p* = 0*.*769 | *d* = −1*.*034  *p* = 0*.*190  *d* = 0*.*912  *p* = 0*.*240  *d* = 1*.*413  *p* = 0*.*114  *d* = −1*.*132  *p* = 0*.*160  *d* = −1*.*398  *p* = 0*.*114  *d* = −1*.*132  *p* = 0*.*160  *d* = −0*.*521  *p* = 0*.*477  *d* = −0*.*828  *p* = 0*.*275  *d* = −3*.*099  *p* = 0*.*006  *d* = −1*.*290  *p* = 0*.*134  *d* = −3*.*804  *p* = 0*.*003  *d* = −0*.*098  *p* = 0*.*879  *d* = −0*.*695  *p* = 0*.*350  *d* = −2*.*722  *p* = 0*.*008  *d* = −1*.*262  *p* = 0*.*134  *d* = −0*.*452  *p* = 0*.*517 |
|  | *p <* 0*.*001 | *p* = 0*.*059 |
| LH midParietal | *d* = −1*.*731 | *d* = −1*.*137 |
|  | *p* = 0*.*014 | *p* = 0*.*076 |
| LH antParietal | *d* = −1*.*266 | *d* = −1*.*194 |
|  | *p* = 0*.*053 | *p* = 0*.*073 |
| LH supFrontal | *d* = −1*.*156 | *d* = −0*.*767 |
|  | *p* = 0*.*064 | *p* = 0*.*200 |
| LH Precentral A PrecG | *d* = −1*.*392 | *d* = −1*.*400 |
|  | *p* = 0*.*037 | *p* = 0*.*064 |
| LH Precentral B IFGop | *d* = −1*.*232 | *d* = −0*.*927 |
|  | *p* = 0*.*055 | *p* = 0*.*132 |
| LH midFrontal | *d* = −1*.*221 | *d* = −1*.*473 |
|  | *p* = 0*.*055 | *p* = 0*.*064 |
| LH midFrontalOrb | *d* = −1*.*036 | *d* = −1*.*174 |
|  | *p* = 0*.*089 | *p* = 0*.*073 |
| LH insula | *d* = −1*.*601 | *d* = −1*.*092 |
|  | *p* = 0*.*020 | *p* = 0*.*083 |
| LH medialFrontal | *d* = −0*.*990 | *d* = −0*.*652 |
|  | *p* = 0*.*098 | *p* = 0*.*261 |
| RH PostParietal | *d* = −3*.*255 | *d* = −1*.*622 |
|  | *p <* 0*.*001 | *p* = 0*.*059 |
| RH midParietal | *d* = −2*.*518 | *d* = −1*.*363 |
|  | *p* = 0*.*001 | *p* = 0*.*064 |
| RH antParietal | *d* = −2*.*543 | *d* = −1*.*364 |
|  | *p* = 0*.*001 | *p* = 0*.*064 |
| RH supFrontal | *d* = −2*.*369 | *d* = −1*.*662 |
|  | *p* = 0*.*002 | *p* = 0*.*059 |
| RH Precentral A PrecG | *d* = −2*.*397 | *d* = −1*.*283 |
|  | *p* = 0*.*002 | *p* = 0*.*073 |
| RH Precentral B IFGop | *d* = −1*.*720 | *d* = −1*.*181 |
|  | *p* = 0*.*014 | *p* = 0*.*073 |
| RH midFrontal | *d* = −3*.*083 | *d* = −1*.*633 | *d* = −2*.*101 |
|  | *p <* 0*.*001 | *p* = 0*.*059 | *p* = 0*.*022 |
| RH midFrontalOrb | *d* = −2*.*596 | *d* = −1*.*386 | *d* = −2*.*201 |
|  | *p* = 0*.*001 | *p* = 0*.*064 | *p* = 0*.*020 |
| RH insula | *d* = −3*.*602 | *d* = −1*.*193 | *d* = −2*.*960 |
|  | *p <* 0*.*001 | *p* = 0*.*073 | *p* = 0*.*006 |
| RH medialFrontal | *d* = −2*.*505 | *d* = −1*.*171 | *d* = −2*.*384 |
|  | *p* = 0*.*001 | *p* = 0*.*073 | *p* = 0*.*015 |

**MD network**

|  |  |  |  |
| --- | --- | --- | --- |
| *d* = −0*.*692 | *d* = −0*.*612 | *d* = −0*.*225 | *d* = −0*.*353 |
| *p <* 0*.*001 | *p <* 0*.*001 | *p* = 0*.*010 | *p <* 0*.*001 |

Table 4: Q3 [CONTROL]: Is language production more demanding than word production?