Table S1. Significant Results for Models Examining the Effects of Writing Stage on Pausing Behaviors

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Fixed effects |  |  |  |  |  |  | Random effects |
| Dependent variable | Pred | *Est* | *SE* | *t* | *p* | *R2m* | *R2c* | Factor | *SD* |
| *Pause frequency between words* |  |  |  |
| Stage 1referencelevel | Stage2 | 0.02 | 0.05 | 0.51 | 0.61 |  |  | Participant (Int) | .12 |
| Stage3 | 0.06 | 0.05 | 1.23 | 0.22 |  |  |  |  |
| Stage4 | 0.02 | 0.05 | 0.49 | 0.63 |  |  |  |  |
| Stage5 | -0.17 | 0.05 | -3.76 | 0.00 |  |  |  |  |
|  |  |  |  |  | Total: | .12 | .41 |  |  |
| Stage 2referencelevel | Stage1 | -0.02 | 0.05 | -0.51 | 0.61 |  |  | Participant (Int) | .12 |
| Stage3 | 0.03 | 0.05 | 0.72 | 0.47 |  |  |  |  |
| Stage4 | 0.00 | 0.05 | -0.02 | 0.98 |  |  |  |  |
|  | Stage5 | -0.19 | 0.05 | -4.26 | 0.00 |  |  |  |  |
|  |  |  |  |  | Total: | .12 | .41 |  |  |
| Stage 3referencelevel | Stage1 | -0.06 | 0.05 | -1.23 | 0.22 |  |  | Participant (Int) | .12 |
| Stage2 | -0.03 | 0.05 | -0.72 | 0.47 |  |  |  |  |
| Stage4 | -0.03 | 0.05 | -0.74 | 0.46 |  |  |  |  |
|  | Stage5 | -0.22 | 0.05 | -4.99 | 0.00 |  |  |  |  |
|  |  |  |  |  | Total: | .12 | .41 |  |  |
| Stage 4referencelevel | Stage1 | -0.02 | 0.05 | -0.49 | 0.63 |  |  | Participant (Int) | .12 |
| Stage2 | 0.00 | 0.05 | 0.02 | 0.98 |  |  |  |  |
| Stage3 | 0.03 | 0.05 | 0.74 | 0.46 |  |  |  |  |
|  | Stage5 | -0.19 | 0.05 | -4.25 | 0.00 |  |  |  |  |
|  |  |  |  |  | Total: | .12 | .41 |  |  |
| *Pause length between words* |
| Stage 1referencelevel | Stage2 | 0.02 | 0.03 | 0.83 | 0.41 |  |  | Participant (Int) | .07 |
| Stage3 | -0.01 | 0.03 | -0.49 | 0.63 |  |  |  |  |
| Stage4 | -0.01 | 0.03 | -0.35 | 0.73 |  |  |  |  |
|  | Stage5 | -0.10 | 0.03 | -3.20 | 0.00 |  |  |  |  |
|  |  |  |  |  | Total: | .08 | .35 |  |  |
| Stage 2referencelevel | Stage1 | -0.02 | 0.03 | -0.83 | 0.41 |  |  | Participant (Int) | .07 |
| Stage3 | -0.04 | 0.03 | -1.32 | 0.19 |  |  |  |  |
| Stage4 | -0.04 | 0.03 | -1.18 | 0.24 |  |  |  |  |
|  | Stage5 | -0.12 | 0.03 | -4.04 | 0.00 |  |  |  |  |
|  |  |  |  |  | Total: | .08 | .35 |  |  |
| Stage 3referencelevel | Stage1 | 0.01 | 0.03 | 0.49 | 0.63 |  |  | Participant (Int) | .07 |
| Stage2 | 0.04 | 0.03 | 1.32 | 0.19 |  |  |  |  |
| Stage4 | 0.00 | 0.03 | 0.14 | 0.89 |  |  |  |  |
|  | Stage5 | -0.08 | 0.03 | -2.72 | 0.01 |  |  |  |  |
|  |  |  |  |  | Total: | .08 | .35 |  |  |
| Stage 4referencelevel | Stage1 | 0.01 | 0.03 | 0.35 | 0.73 |  |  | Participant (Int) | .07 |
| Stage2 | 0.04 | 0.03 | 1.18 | 0.24 |  |  |  |  |
| Stage3 | 0.00 | 0.03 | -0.14 | 0.89 |  |  |  |  |
|  | Stage5 | -0.08 | 0.03 | -2.86 | 0.01 |  |  |  |  |
|  |  |  |  |  | Total: | .08 | .35 |  |  |
| *Pause length between sentences* |  |  |  |
| Stage 1referencelevel | Stage2 | -0.37 | 0.09 | -3.96 | 0.00 |  |  | Participant (Int) | .14 |
| Stage3 | -0.46 | 0.09 | -4.88 | 0.00 |  |  |  |  |
| Stage4 | -0.44 | 0.09 | -4.72 | 0.00 |  |  |  |  |
| Stage5 | -0.61 | 0.09 | -6.49 | 0.00 |  |  |  |  |
|  |  |  |  |  | Total: | .21 | .32 |  |  |
| Stage 2referencelevel | Stage1 | 0.37 | 0.09 | 3.96 | 0.00 |  |  | Participant (Int) | .14 |
| Stage3 | -0.09 | 0.09 | -0.91 | 0.36 |  |  |  |  |
| Stage4 | -0.07 | 0.09 | -0.75 | 0.45 |  |  |  |  |
|  | Stage5 | -0.24 | 0.09 | -2.53 | 0.01 |  |  |  |  |
|  |  |  |  |  | Total: | .21 | .32 |  |  |

Table S2. Results for Models Examining the Effects of Non-word Span on the

Relationship between Stage and Pausing Behaviours

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Fixed effects |  |  |  |  |  |  | Random effects |
| Dependent variable | Pred | *Est* | *SE* | *t* | *p* | *R2m* | *R2c* | Factor | *SD* |
| *Pause frequency between words* |  |  |  |
| Stage 1referencelevel | Stage2 | 0.04 | 0.12 | 0.35 | 0.72 |  |  | Participant (Int) |  .12 |
| Stage3 | 0.23 | 0.12 | 1.93 | 0.06 |  |  |  |  |
| Stage4 | -0.18 | 0.12 | -1.48 | 0.14 |  |  |  |  |
| Stage5 | -0.50 | 0.12 | -4.20 | 0.00 |  |  |  |  |
| NW | 0.01 | 0.03 | 0.29 | 0.77 |  |  |  |  |
|  | NWS:Stage2 | -0.01 | 0.03 | -0.20 | 0.85 |  |  |  |  |
|  | NWS:Stage3 | -0.05 | 0.03 | -1.51 | 0.13 |  |  |  |  |
|  | NWS:Stage4 | 0.06 | 0.03 | 1.83 | 0.07 |  |  |  |  |
|  | NWS:Stage5 | 0.10 | 0.03 | 3.06 | 0.00 |  |  |  |  |
|  |  |  |  |  | Total: | .23 | .52 |  |  |
| Stage 2referencelevel | Stage1 | -0.04 | 0.12 | -0.35 | 0.72 |  |  | Participant (Int) |  .12 |
| Stage3 | 0.19 | 0.12 | 1.58 | 0.12 |  |  |  |  |
| Stage4 | -0.22 | 0.12 | -1.84 | 0.07 |  |  |  |  |
|  | Stage5 | -0.55 | 0.12 | -4.56 | 0.00 |  |  |  |  |
|  | NW | 0.00 | 0.03 | 0.07 | 0.94 |  |  |  |  |
|  | NWS:Stage1 | 0.01 | 0.03 | 0.20 | 0.85 |  |  |  |  |
|  | NWS:Stage3 | -0.04 | 0.03 | -1.31 | 0.19 |  |  |  |  |
|  | NWS:Stage4 | 0.07 | 0.03 | 2.02 | 0.05 |  |  |  |  |
|  | NWS:Stage5 | 0.11 | 0.03 | 3.26 | 0.00 |  |  |  |  |
|  |  |  |  |  | Total: | .23 | .52 |  |  |
| Stage 3referencelevel | Stage1 | -0.23 | 0.12 | -1.93 | 0.06 |  |  | Participant (Int) |  .12 |
| Stage2 | -0.19 | 0.12 | -1.58 | 0.12 |  |  |  |  |
| Stage4 | -0.41 | 0.12 | -3.42 | 0.00 |  |  |  |  |
|  | Stage5 | -0.73 | 0.12 | -6.14 | 0.00 |  |  |  |  |
|  | NW | -0.04 | 0.03 | -1.38 | 0.17 |  |  |  |  |
|  | NWS:Stage1 | 0.05 | 0.03 | 1.51 | 0.13 |  |  |  |  |
|  | NWS:Stage2 | 0.04 | 0.03 | 1.31 | 0.19 |  |  |  |  |
|  | NWS:Stage4 | 0.11 | 0.03 | 3.33 | 0.00 |  |  |  |  |
|  | NWS:Stage5 | 0.15 | 0.03 | 4.57 | 0.00 |  |  |  |  |
|  |  |  |  |  | Total: | .23 | .52 |  |  |
| *Median pause length within words* |  |  |  |
| Stage 2referencelevel | Stage1 | 0.24 | 0.21 | 1.16 | 0.25 |  |  | Participant (Int) |  .12 |
| Stage3 | 0.05 | 0.21 | 0.26 | 0.80 |  |  |  |  |
| Stage4 | 0.47 | 0.21 | 2.29 | 0.02 |  |  |  |  |
| Stage5 | 0.18 | 0.21 | 0.87 | 0.39 |  |  |  |  |
| NW | 0.09 | 0.04 | 2.04 | 0.04 |  |  |  |  |
|  | NWS:Stage1 | -0.06 | 0.06 | -1.07 | 0.29 |  |  |  |  |
|  | NWS:Stage3 | -0.02 | 0.06 | -0.27 | 0.79 |  |  |  |  |
|  | NWS:Stage4 | -0.15 | 0.06 | -2.60 | 0.01 |  |  |  |  |
|  | NWS:Stage5 | -0.07 | 0.06 | -1.21 | 0.23 |  |  |  |  |
|  |  |  |  |  | Total: | .07 | .21 |  |  |
| *Median pause length between sentences* |  |  |
| Stage 1 referenceLevel | Stage2 | 0.26 | 0.26 | 0.98 | 0.33 |  |  | Participant (Int) |  .15 |
| Stage3 | -0.06 | 0.26 | -0.23 | 0.82 |  |  |  |  |
| Stage4 | -0.22 | 0.26 | -0.82 | 0.41 |  |  |  |  |
| Stage5 | -0.26 | 0.26 | -0.98 | 0.33 |  |  |  |  |
| NW | 0.14 | 0.06 | 2.39 | 0.02 |  |  |  |  |
|  | NWS:Stage2 | -0.19 | 0.07 | -2.61 | 0.01 |  |  |  |  |
|  | NWS:Stage3 | -0.12 | 0.07 | -1.65 | 0.10 |  |  |  |  |
|  | NWS:Stage4 | -0.07 | 0.07 | -0.90 | 0.37 |  |  |  |  |
|  | NWS:Stage5 | -0.11 | 0.07 | -1.54 | 0.13 |  |  |  |  |
|  |  |  |  |  | Total: | .27 | .38 |  |  |

*\**NWS = Non-word Span

Table S3. Results for Models Examining the Effects of Corsi Forward on the

Relationship between Stage and Pausing Behaviours

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Fixed effects |  |  |  |  |  |  | Random effects |
| DependentVariable | Pred | *Est* | *SE* | *t* | *p* | *R2m* | *R2c* | Factor | *SD* |
| *Pause frequency between words* |  |  |  |
| Stage 3referencelevel | Stage1 | -0.14 | 0.12 | -1.12 | 0.27 |  |  | Participant (Int) |  .12 |
| Stage2 | -0.06 | 0.12 | -0.48 | 0.63 |  |  |  |  |
| Stage4 | -0.21 | 0.12 | -1.76 | 0.08 |  |  |  |  |
| Stage5 | -0.53 | 0.12 | -4.32 | 0.00 |  |  |  |  |
|  | CF | 0.00 | 0.00 | -0.68 | 0.50 |  |  |  |  |
|  | CF:Stage1 | 0.00 | 0.00 | 0.71 | 0.48 |  |  |  |  |
|  | CF:Stage2 | 0.00 | 0.00 | 0.23 | 0.82 |  |  |  |  |
|  | CF:Stage4 | 0.00 | 0.00 | 1.59 | 0.11 |  |  |  |  |
|  | CF:Stage5 | 0.01 | 0.00 | 2.66 | 0.01 |  |  |  |  |
|  |  |  |  |  | Total: | .16 | .46 |  |  |
| *Median pause length between words* |  |  |  |
| Stage 1reference level | Stage2 | -0.24 | 0.08 | -3.05 | 0.00 |  |  | Participant (Int) |  .07 |
| Stage3 | -0.21 | 0.08 | -2.68 | 0.01 |  |  |  |  |
| Stage4 | -0.26 | 0.08 | -3.29 | 0.00 |  |  |  |  |
|  | Stage5 | -0.27 | 0.08 | -3.45 | 0.00 |  |  |  |  |
|  | CF | 0.00 | 0.00 | -3.83 | 0.00 |  |  |  |  |
|  | CF:Stage2 | 0.00 | 0.00 | 3.60 | 0.00 |  |  |  |  |
|  | CF:Stage3 | 0.00 | 0.00 | 2.67 | 0.01 |  |  |  |  |
|  | CF:Stage4 | 0.00 | 0.00 | 3.37 | 0.00 |  |  |  |  |
|  | CF:Stage5 | 0.00 | 0.00 | 2.39 | 0.02 |  |  |  |  |
|  |  |  |  |  | Total: | .17 | .43 |  |  |

*\**CF = Corsi Forward

Table S4. Results for Models Examining the Effects of Corsi Backward on the

Relationship between Stage and Pausing Behaviours

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Fixed effects |  |  |  |  |  |  | Random effects |
| DependentVariable | Pred | *Est* | *SE* | *t* | *p* | *R2m* | *R2c* | Factor | *SD* |
| *Median pause length between words* |  |  |  |
| Stage 1reference level | Stage2 | -0.16 | 0.14 | -1.18 | 0.24 |  |  | Participant (Int) |  .08 |
| Stage3 | -0.17 | 0.14 | -1.20 | 0.23 |  |  |  |  |
| Stage4 | -0.21 | 0.14 | -1.54 | 0.13 |  |  |  |  |
|  | Stage5 | -0.44 | 0.14 | -3.14 | 0.00 |  |  |  |  |
|  | CB | 0.00 | 0.00 | -1.35 | 0.18 |  |  |  |  |
|  | CB:Stage2 | 0.00 | 0.00 | 1.38 | 0.17 |  |  |  |  |
|  | CB:Stage3 | 0.00 | 0.00 | 1.12 | 0.27 |  |  |  |  |
|  | CB:Stage4 | 0.00 | 0.00 | 1.50 | 0.14 |  |  |  |  |
|  | CB:Stage5 | 0.01 | 0.00 | 2.51 | 0.01 |  |  |  |  |
|  |  |  |  |  | Total: | .11 | .39 |  |  |

*\**CB = Corsi Backward

Table S5. Results for Models Examining the Effects of Operation Span on the

Relationship between Stage and Pausing Behaviours

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Fixed effects |  |  |  |  |  |  | Random effects |
| DependentVariable | Pred | *Est* | *SE* | *t* | *p* | *R2m* | *R2c* | Factor | *SD* |
| *Median pause length between sentences* |
| Stage 3 referenceLevel | Stage1 | 0.96 | 0.27 | 3.56 | 0.00 |  |  | Participant (Int) |  .15 |
| Stage2 | 0.47 | 0.27 | 1.72 | 0.09 |  |  |  |  |
| Stage4 | 0.82 | 0.27 | 3.03 | 0.00 |  |  |  |  |
|  | Stage5 | 0.32 | 0.27 | 1.20 | 0.23 |  |  |  |  |
|  | OSPAN | 0.01 | 0.00 | 1.58 | 0.12 |  |  |  |  |
|  | OSPAN:Stage1 | -0.01 | 0.00 | -1.99 | 0.05 |  |  |  |  |
|  | OSPAN:Stage2 | -0.01 | 0.00 | -1.49 | 0.14 |  |  |  |  |
|  | OSPAN:Stage4 | -0.02 | 0.00 | -3.15 | 0.00 |  |  |  |  |
|  | OSPAN:Stage5 | -0.01 | 0.00 | -1.86 | 0.07 |  |  |  |  |
|  |  |  |  |  | Total: | .27 | .38 |  |  |

*\** OSPAN = Operation Span

Table S6. Results for Models Examining the Effects of Colour Shape Task on the

Relationship between Stage and Pausing Behaviours

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Fixed effects |  |  |  |  |  |  | Random effects |
| DependentVariable | Pred | *Est* | *SE* | *t* | *p* | *R2m* | *R2c* | Factor | *SD* |
|  *Pause frequency within words* |  |  |  |
|  Stage 1 reference level | Stage2 | 0.10 | 0.13 | 0.78 | 0.43 |  |  | Participant (Int) | .16 |
| Stage3 | 0.19 | 0.13 | 1.46 | 0.15 |  |  |  |  |
| Stage4 | 0.02 | 0.13 | 0.15 | 0.88 |  |  |  |  |
|  | Stage5 | 0.07 | 0.13 | 0.51 | 0.61 |  |  |  |  |
|  | CS | 0.00 | 0.00 | 1.96 | 0.05 |  |  |  |  |
|  | CS:Stage2 | 0.00 | 0.00 | -0.83 | 0.41 |  |  |  |  |
|  | CS:Stage3 | 0.00 | 0.00 | -2.54 | 0.01 |  |  |  |  |
|  | CS:Stage4 | 0.00 | 0.00 | -1.15 | 0.25 |  |  |  |  |
|  | CS:Stage5 | 0.00 | 0.00 | -1.23 | 0.22 |  |  |  |  |
|  |  |  |  |  | Total: | .06 | .31 |  |  |

*\**CS = Color Shape Task

Table S7. Significant Results for Models Examining the Effects of Writing Stage on Revision Behaviors

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Fixed effects |  |  |  |  |  |  | Random effects |
| Dependent variable | Pred | *Est* | *SE* | *t* | *p* | *R2m* | *R2c* | Factor | *SD* |
| *Revision at word level* |  |  |  |
| Stage 1referencelevel | Stage2 | 0.13 | 0.06 | 2.11 | 0.04 |  |  | Participant (Int) | .25 |
| Stage3 | 0.17 | 0.06 | 2.87 | 0.00 |  |  |  |  |
| Stage4 | 0.12 | 0.06 | 2.01 | 0.05 |  |  |  |  |
| Stage5 | 0.18 | 0.06 | 3.10 | 0.00 |  |  |  |  |
|  |  |  |  |  | Total: | .04 | .56 |  |  |
| *Revision below clause level* |
| Stage 1referencelevel | Stage2 | -0.01 | 0.07 | -0.14 | 0.89 |  |  | Participant (Int) | .25 |
| Stage3 | 0.13 | 0.07 | 1.71 | 0.09 |  |  |  |  |
| Stage4 | 0.30 | 0.07 | 3.99 | 0.00 |  |  |  |  |
|  | Stage5 | 0.21 | 0.07 | 2.76 | 0.01 |  |  |  |  |
|  |  |  |  |  | Total: | .09 | .49 |  |  |
| Stage 2referencelevel | Stage1 | 0.01 | 0.07 | 0.14 | 0.89 |  |  | Participant (Int) | .25 |
| Stage3 | 0.14 | 0.07 | 1.85 | 0.07 |  |  |  |  |
| Stage4 | 0.31 | 0.07 | 4.13 | 0.00 |  |  |  |  |
|  | Stage5 | 0.22 | 0.07 | 2.90 | 0.00 |  |  |  |  |
|  |  |  |  |  | Total: | .09 | .49 |  |  |
| *Revision at clause level* |  |  |  |
| Stage 1referencelevel | Stage2 | -0.03 | 0.08 | -0.43 | 0.67 |  |  | Participant (Int) | .14 |
| Stage3 | -0.13 | 0.08 | -1.58 | 0.12 |  |  |  |  |
| Stage4 | -0.25 | 0.08 | -3.12 | 0.00 |  |  |  |  |
| Stage5 | -0.14 | 0.08 | -1.68 | 0.10 |  |  |  |  |
|  |  |  |  |  | Total: | .06 | .21 |  |  |
| Stage 2referencelevel | Stage1 | 0.03 | 0.08 | 0.43 | 0.67 |  |  | Participant (Int) | .14 |
| Stage3 | -0.09 | 0.08 | -1.15 | 0.25 |  |  |  |  |
| Stage4 | -0.22 | 0.08 | -2.69 | 0.01 |  |  |  |  |
|  | Stage5 | -0.10 | 0.08 | -1.24 | 0.22 |  |  |  |  |
|  |  |  |  |  | Total: | .06 | .21 |  |  |
| *Eye-gaze at previous sentence before revision* |  |
| Stage 1 referenceLevel | Stage2 | 0.19 | 0.08 | 2.36 | 0.02 |  |  | Participant (Int) | .13 |
| Stage3 | 0.18 | 0.08 | 2.33 | 0.02 |  |  |  |  |
| Stage4 | 0.11 | 0.08 | 1.41 | 0.16 |  |  |  |  |
|  | Stage5 | 0.22 | 0.08 | 2.84 | 0.01 |  |  |  |  |
|  |  |  |  |  | Total:: | .05 | .20 |  |  |