**Appendices**

Appendix A: Verbs used in the studies

|  |  |  |
| --- | --- | --- |
| **Transitive-only verbs** | **Intransitive-only verbs** | **Alternating verbs** |
| cut | go | break |
| slice | come | rip |
| chop | rise | shatter |
| mash | fall | smash |
| hit | tumble | grow |
| strike | ascend | change |
| bite | descend | bake |
| peck | exit | boil |
| touch | enter | cook |
| stroke | arrive | fry |
| slash | eat | burn |
| saw | jump | split |
| crush | hop | tear |
| squash | run | melt |
| kick | drink | crack |
| tap | talk | improve |
| whack | swim | inflate |
| punch | climb | alter |
| nudge | sing | shrink |
| kiss | sleep | freeze |
| kill | smile | crash |
| destroy | cry  | fold |
| demolish | laugh | crease |
| take | frown | deflate |
| bring | giggle | defrost |
| raise | chortle | dissolve |
| hoist | chuckle | enlarge |
| lift | grin | expand |
| lower | groan | open |
| leave | moan | close |
| drop | glow | snap |
| tickle | glitter | bend |
| amuse | leak | slide |
| feed | appear | move |
| delight | disappear | roll |
| give | vanish | bounce |
| madden | die | turn |
| lend | stay | begin |
| pay | wait | start |
| offer | live | stop |

Appendix B: Details of the statistical models

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Judgment study: Single-predictor models** |   |   |   |   |   |   |   |   |   |   |   |
|   | **Age 5-6** |  | **Age 9-10** |  | **Adults** |   | **Interaction: Age Group x Predictor** |   |
|   | **AIC** | **Chi** | **p (Chi)** |  | **AIC** | **Chi** | **p (Chi)** |  | **AIC** | **Chi** | **p (Chi)** |   | **AIC** | **Chi** | **p (Chi)** |   |
| **Ratings of transitives** |   |  |  |  |  |  |  |  |  |  |   |   |   |   |   |
| Preemption | 7556.3 | 31.2 | < .001 | \*\*\* | 6524.0 | 50.8 | < .001 | \*\*\* | 3891.5 | 54.4 | < .001 | \*\*\* | 18750.0 | 32.0 | < .001 | \*\*\* |
| Entrenchment | 7556.7 | 26.5 | < .001 | \*\*\* | 6528.3 | 35.5 | < .001 | \*\*\* | 3946.8 | 37.5 | < .001 | \*\*\* | 18783.0 | 18.9 | < .001 | \*\*\* |
| Semantics | 7565.9 | 22.8 | < .001 | \*\*\* | 6574.1 | 29.6 | < .001 | \*\*\* | 3946.7 | 34.4 | < .001 | \*\*\* | 18864.0 | 22.7 | < .001 | \*\*\* |
|   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| **Ratings of intransitives** |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Preemption | 7616.0 | 10.6 | .001 | \*\* | 6587.1 | 26.9 | < .001 | \*\*\* | 4007.9 | 33.7 | < .001 | \*\*\* | 19077.0 | 22.4 | < .001 | \*\*\* |
| Entrenchment | 7616.3 | 10.4 | .001 | \*\* | 6588.4 | 33.1 | < .001 | \*\*\* | 4009.4 | 36.2 | < .001 | \*\*\* | 19079.0 | 26.5 | < .001 | \*\*\* |
| Semantics | 7621.4 | 12.1 | .001 | \*\*\* | 6565.2 | 37.2 | < .001 | \*\*\* | 3988.9 | 33.0 | < .001 | \*\*\* | 19065.0 | 26.5 | < .001 | \*\*\* |
|   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| **Difference scores** |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Preemption1 | 6918.7 | 44.3 | < .001 | \*\*\* | 6007.4 | 67.1 | < .001 | \*\*\* | 3671.6 | 82.4 | < .001 | \*\*\* | 17165 | 53.72 | < .001 | \*\*\* |
| Entrenchment | 6917.3 | 49.6 | < .001 | \*\*\* | 5976.6 | 88.9 | < .001 | \*\*\* | 3659.0 | 115.1 | < .001 | \*\*\* | 17110.0 | 70.2 | < .001 | \*\*\* |
| Semantics | 6939.6 | 31.6 | < .001 | \*\*\* | 6070.5 | 49.4 | < .001 | \*\*\* | 3725.8 | 49.5 | < .001 | \*\*\* | 17311.0 | 38.7 | < .001 | \*\*\* |

1. It was necessary to remove the correlation between the random slope and the intercept in order to enable this model to converge

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Judgment study: Simultaneous (multiple-predictor) models**  |   |   |   |   |   |
|   | **Age 5-6** |  | **Age 9-10** |  | **Adults** |   |
|   | **AIC** | **Chi** | **p (Chi)** |  | **AIC** | **Chi** | **p (Chi)** |  | **AIC** | **Chi** | **p (Chi)** |   |
| **Ratings of transitives** |   |   |   |   |   |   |   |   |   |   |   |
| Preemption | 7525.3 | 5.4 | .021 | \* | 6462.3 | 13.6 | < .001 | \*\*\* | 3849.2 | 15.0 | < .001 | \*\*\* |
| Entrenchment | 7522.4 | 2.4 | .121 |   | 6450.6 | 1.9 | .171 |   | 3835.8 | 1.6 | .209 |   |
| Semantics | 7525.7 | 5.7 | .017 | \* | 6456.0 | 7.2 | .007 | \*\* | 3844.1 | 9.9 | .002 | \*\* |
|   |   |   |   |   |   |   |   |   |   |   |   |   |
| **Ratings of intransitives** |   |   |   |   |   |   |   |   |   |   |
| Preemption | 7604.2 | 1.7 | .193 |   | 6503.2 | 2.4 | .121 |   | 3936.5 | 5.1 | .024 | \* |
| Entrenchment | 7602.8 | 0.3 | .593 |   | 6503.8 | 3.0 | .085 |  | 3933.9 | 2.6 | .108 |   |
| Semantics | 7607.8 | 5.2 | .022 | \* | 6519.4 | 18.6 | < .001 | \*\*\* | 3945.8 | 14.4 | < .001 | \*\*\* |
|   |   |   |   |   |   |   |   |   |   |   |   |   |
| **Difference scores** |   |   |   |   |   |   |   |   |   |   |   |
| Preemption | 6866.1 | 1.7 | .198 |   | 5847.6 | 0.5 | .459 |   | 3518.9 | 2.7 | .100 |  |
| Entrenchment | 6869.7 | 5.2 | .022 | \* | 5866.0 | 19.0 | < .001 | \*\*\* | 3533.6 | 17.4 | < .001 | \*\*\* |
| Semantics | 6874.1 | 9.6 | .002 | \*\* | 5866.4 | 19.4 | < .001 | \*\*\* | 3534.5 | 18.2 | < .001 | \*\*\* |
|   |   |   |   |   |   |   |   |   |   |   |   |   |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Production study.** |   |   |   |   |   |
|   | **Single-predictor models** |  | **Simultaneous models** |
|   | **AIC** | **Chi** | **p (Chi)** |  | **AIC** | **Chi** | **p (Chi)** |
| **Transitivisation errors for intransitive-only verbs** |   |   |   |
| Preemption | 403.1 | 5.6 | .018 | \* | 401.6 | 2.6 | .105 |
| Entrenchment | 403.1 | 3.4 | .065 |  | 399.4 | 0.5 | .497 |
| Semantics | 401.7 | 0.2 | .671 |   | 398.9 | 0.0 | .941 |
|   |   |   |   |   |   |   |   |
| **Intransitivisation errors for transitive-only verbs** |   |   |   |
| Preemption | 454.2 | 0.0 | .971 |   | 455.4 | 0.0 | .979 |
| Entrenchment | 454.4 | 0.7 | .392 |   | 458.1 | 2.7 | .100 |
| Semantics | 460.9 | 1.6 | .208 |   | 457.2 | 1.8 | .180 |

Appendix C: Additional figures. Note that Error bars show 95% Bayesian Highest Density Intervals. These are particularly useful because they allow inferences to be read directly off the plot: two values are different if the point estimate for the former lies outside of the 95% HDI for the other.



*Figure 11.* Mean by-child rates of transitivisation error and 95% Bayesian Highest Density Intervals.



*Figure 12.* Mean by-child rates of intransitivisation error and 95% Bayesian Highest Density Intervals.



*Figure 13.* Mean by-verb rates of transitivisation error and 95% Bayesian Highest Density Intervals.



*Figure 14.* Mean by-verb rates of intransitivisation error and 95% Bayesian Highest Density Intervals.