

Supplemental Material

Section A: Below is example code for the linear mixed effects model analysis that was used for the first lines in Table 6. For the remainder of the mixed effects analyses, we included one additional variable (e.g. intelligence), as well as two additional two-way interactions and the three-way interaction.

```
#install.packages("arm",dep=T)
#install.packages("languageR",dep=T)
reading=read.table("A1.txt", header=TRUE)
reading.lmerSxV =
lmer(response~struct+verb+struct:verb+(1+struct:verb|subject)+(1+struct:verb|item),data=reading, family =
"binomial")
summary(reading.lmerSxV)
```

Section B: In order to verify the statistical significance of z -statistics with values < 2 , we ran follow up analyses by comparing models using the `anova()` function in R. There was one interaction between intelligence and sentence structure (i.e. ambiguity) in which the z -value was -1.937 (see Table 6 and Figure 1). The models we compared and the results of the analysis are presented below. As can be seen, adding the structure \times intelligence interaction produces a significant improvement in fit.

The structure \times intelligence interaction also produced a z -value < 2 when both intelligence and inhibition were tested in the same model (see Table 9). We conducted a follow up analysis for this interaction by including the inhibition and comparing two models (based on the inclusion of the structure \times intelligence interaction).

Follow up analysis 1

```
reading.lmerSVISxV = lmer(response~struct+verb+IQ+struct:verb+(1+struct:verb |subject)+(1+struct:verb
|item),data=reading, family = "binomial")
```

```
reading.lmerSVISxVSxI = lmer(response~struct+verb+IQ+struct:verb+struct:IQ+(1+struct:verb
|subject)+(1+struct:verb |item),data=reading, family = "binomial")
```

```
anova(reading.lmerSVISxV, reading.lmerSVISxVSxI)
```

	Df	AIC	BIC	logLik	deviance	Chisq	Df	Pr(>Chisq)
lmerSVISxV	7	3646.8	3691.2	-1816.4	3632.8			
lmerSVISxVSxI	8	3640.6	3691.3	-1812.3	3624.6	8.2147	1	0.004155**

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Follow up analysis 2

```
reading.lmerSVIISxV = lmer(response~struct+verb+IQ+IN+struct:verb+(1+struct:verb |subject)+(1+struct:verb
|item),data=reading, family = "binomial")
```

```
reading.lmerSVIISxVSxI = lmer(response~struct+verb+IQ+IN+struct:verb+struct:IQ+(1+struct:verb
|subject)+(1+struct:verb |item),data=reading, family = "binomial")
```

```
anova(reading.lmerSVIISxV, reading.lmerSVIISxVSxI)
```

	Df	AIC	BIC	logLik	deviance	Chisq	Df	Pr(>Chisq)
reading.lmerSVIISxV	8	3646.4	3697.1	-1815.2	3630.4			
reading.lmerSVIISxVSxI	9	3640.0	3697.1	-1811.0	3622.0	8.3153	1	0.003931**

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1