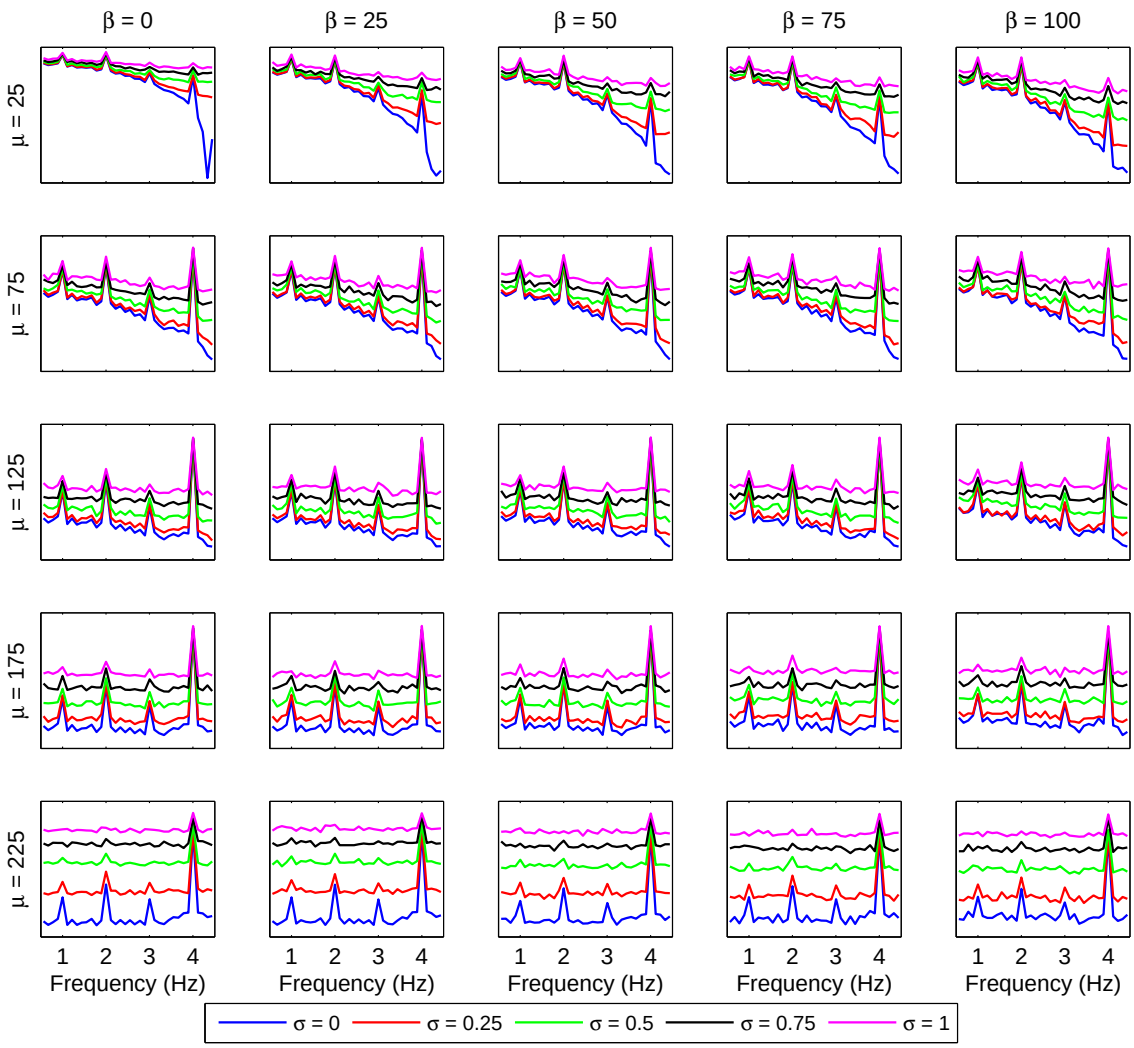
S4 Appendix Setting model parameters

The model has three free parameters:

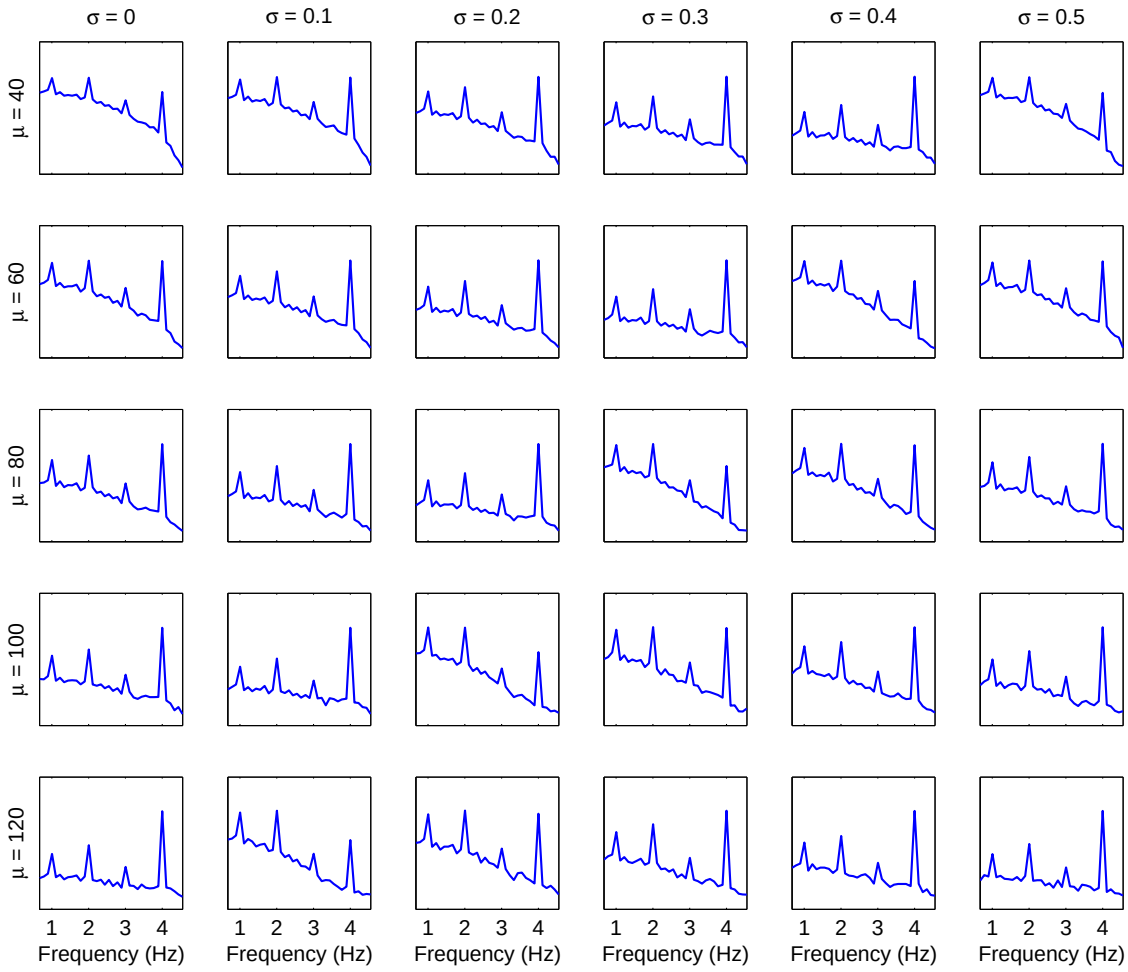
- μ: The average arrival time of lexical information, in simulated milliseconds from word onset
- β: The width of the uniform distribution of arrival time of lexical information
- σ: The standard deviation of Gaussian noise

Appropriate values for these parameters were found by getting a new set of word vectors (with $N = 300$) for the English [NP VP] sentences. The objective was to find μ, β, and σ such that the frequency spectrum resembles the corresponding results from Ding et al. in this condition, that is, there are peaks at 1 Hz, 2 Hz, and 4 Hz, possibly a minor peak at 3 Hz, no other peaks, and a slight increase in power for lower frequencies.

S4 Fig shows the power spectra for each combination of $\mu \in \{25, 75, 125, 175, 225\}, \beta \in \{0, 25, 50, 75, 100\}$, and $\sigma \in \{0, .25, .5, .75, 1\}$. The three major peaks at 1 Hz, 2 Hz, and 4 Hz, and the minor peak at 3 Hz, are clearly visible for most combinations of parameter values. Only for very high levels of noise σ or when both μ and β are high (which means that much lexical information never arrives) are the power spectra mostly flat. These results motivated us to fix β at 50 and perform a more fine-grained search through parameter space for low-to-medium levels of μ and σ. Based on visual inspection of the resulting power spectra in S5 Fig, we settled for $\mu = 40$ and $\sigma = 0.5$. The parameters are not over-fitted, as is clear from the fact that the same combination of values resulted in very similar power spectra using another set of vectors as well as on the Chinese sentences (Fig. 1).



S4 Fig. Power spectra resulting from processing English [NP VP] sentences, for different combinations of parameter values.



S5 Fig. Power spectra resulting from processing English [NP VP] sentences, for $\beta = 50$ and different values of μ and σ.