

**Supporting Information for: Stärk, K., Kidd, E., & Frost, R. L. A. Close encounters of the word kind: Attested distributional information boosts statistical learning. Article accepted in *Language Learning* on 14 June 2022.**

Appendix S1: Experiment Testing the Validity of Our Stimuli

In the design of our main experiment, we made the explicit assumption that naturally occurring syllable combinations comprising highly attested transitional probabilities were more word-like, which led to the prediction that participants would require less exposure to chunk these adjacent syllables into words. Here, we sought independent evidence to confirm that this was the case. We tested 42 monolingual, native German-speaking adults in a two-alternative forced-choice task where we presented participants with either one of our experimental words (naturalistic or non-naturalistic, manipulated between-participants) and a part-word foil, and asked them to choose which word sounded more word-like. We conducted the study online using the experiment software Gorilla (Anwyl-Irvine et al., 2020) and the recruitment platform Prolific (Prolific, 2021). Participants were automatically assigned to one of two conditions: naturalistic or non-naturalistic. In the naturalistic condition, the target words were based on attested German syllable transitions (i.e., the six words from the naturalistic sequences of the experiment described in the main body of this paper) whereas in the non-naturalistic condition, the target words were devoid of any attested German syllable transitions (i.e., the six words from the non-naturalistic sequences of the experiment described in the main body of this paper). Each target word was presented four times, paired with four different part words with which it shared one syllable. Like the non-naturalistic words, the part words did not contain attested bigrams in our corpus.

We analysed the data using a generalised linear mixed-effects model with participants' performance on the two-alternative forced-choice task as the dependent variable. We specified a binomial distribution because the dependent variable was the correct/incorrect response to the task. We added naturalness (effect coding: naturalistic: +1, and non-naturalistic: -1) as a fixed effect and the random intercept of participants as a random effect.

No random intercept for items was added because differences between items were the key aspect of our design (i.e., we designed items to test the difference between naturalness, therefore testing systematic rather than random variation). No random slopes were added due to the between-participants design and the condition-dependent stimuli. The participants significantly rated naturalistic words as more word-like than non-naturalistic words in comparison to foils,  $b = 0.34$ , 95% CI [0.19, 0.50],  $t = 4.32$ ,  $p < .001$ . Notably, responses differed from chance in the naturalistic condition but not in the non-naturalistic condition: naturalistic,  $M = .68$ ,  $SD = .47$ ,  $t(479) = 8.51$ ,  $p < .001$ ; non-naturalistic,  $M = .52$ ,  $SD = .50$ ,  $t(527) = 1.04$ ,  $p = .30$ . This indicated that naturalistic target words were distinguishable from foils as resembling German words but the non-naturalistic target words were not distinguishable from foils (for more details about the stimuli and analyses, see OSF: <https://osf.io/p9fcm>).

The participants' preference for naturalistic words over foils provided additional evidence to support our claim that our naturalistic words were indeed perceived as more word-like by native speakers of German and that the participants in the main experiment built upon this prior knowledge when repeating the naturalistic sequences. Furthermore, the participants showed no such preference for non-naturalistic words over foils, equally supporting our claim that those syllable combinations were perceived as unfamiliar, with the participants in the main experiment first needing to identify the within-experiment distributional information before their performance on the non-naturalistic structured sequences differed from the foils.

## References

Anwyl-Irvine, A. L., Massonnié, J., Flitton, A., Kirkham, N., & Evershed, J. K. (2020).

Gorilla in our midst: An online behavioral experiment builder. *Behavior Research Methods*, 52(1), 388–407. <https://doi.org/10.3758/s13428-019-01237-x>

Prolific. (2021). Retrieved January 4, 2021 from <https://www.prolific.co>