

Appendix S1: Sample Lexical Items

Sample list of lexical items. There were eight such lists with different Alienese-to-English meaning mapping.

| Alienese | English | Dutch |
|-------------------------|----------------|--------------|
| Transitive verbs | | |
| basi | to dress | aankleden |
| dase | to chase | achtervolgen |
| haki | to dry someone | afdrogen |
| kisu | to scare | bangmaken |
| momu | to serve | bedienen |
| mose | to hassle | bedreigen |
| nago | to greet | begroeten |
| nosoku | to pay | betalen |
| nuga | to jostle | duwen |
| oku | to photograph | fotograferen |
| omo | to help | helpen |
| ona | to interview | interviewen |
| sawe | to hug | knuffelen |
| sitagu | to massage | masseren |
| sosa | to tow | meetrokken |
| teso | to measure | meten |
| tomi | to call after | naroepen |

| | | |
|--------|-------------------------|----------------|
| tose | to make wet | natmaken |
| agero | to shoot | neerschieten |
| epaki | to topple | omtrekken |
| hakaro | to pick someone up | optillen |
| hakenu | to help getting up | overeindhelpen |
| hakoba | to annoy | pesten |
| hipare | to kick | schoppen |
| imera | to hit | slaan |
| misabe | to tow | slepen |
| mukare | to stop | stoppen |
| nagabi | to draw | tekenen |
| nurasi | to console | troosten |
| odaku | to wave someone goodbye | uitzwaaien |
| odoka | to tie someone | vastbinden |
| odosi | to attend to someone | verzorgen |
| osuta | to find | vinden |
| sikimo | to feed | voeren |
| utape | to send away | wegsturen |
| utuso | to choke | wurgen |

Intransitive verbs

| | | |
|--------|--------------|----------|
| atoku | to dry | afdrogen |
| mikuro | to yawn | gapen |
| parube | to bend over | buigen |
| simera | to dance | dansen |
| tokasi | to think | denken |

| | | |
|--------------|-----------|----------|
| mimu | to jump | hinkelen |
| ote | to cry | huilen |
| suki | to clap | klappen |
| ucha | to beckon | zwaaien |
| ugo | to drink | drinken |
| Nouns | | |
| josa | woman | vrouw |
| komi | man | man |
| sako | boy | jongen |
| miru | girl | meisje |

Sample sentences of the same content with the three different word orders.

| Word Order | Alienese | Literal English translation |
|---------------------|-----------------|------------------------------------|
| Object Subject Verb | Josa komi oku. | *Woman man photograph. |
| Verb Object Subject | Oku josa komi. | *Photograph woman man. |
| Subject Verb Object | Komi oku josa. | *Man photograph woman. |
| Subject Verb | Miru simera | *Girl dance. |

Appendix S2: Summary of Statistical Results

Table S1 Summary of fixed effects for the overall reading times over all days. The main contrasts of interests are marked in bold.

| Predictor | Coefficient | SE | t | p | |
|-------------------------------------------------------------|--------------------|-------------|---------------|-----------------|------------|
| Intercept | 2.44 | 0.04 | 54.57 | <.001 | *** |
| Day (Day 3 vs. Day 9) | 0.06 | 0.03 | 2.03 | 0.056 | . |
| Day (Day 2 vs Day 3&9) | 0.49 | 0.04 | 11.64 | <.001 | *** |
| Syntax | -0.03 | 0.01 | -4.71 | <.001 | *** |
| Verb | -0.06 | 0.01 | -11.07 | <.001 | *** |
| Type of Sentence (Freq Vs. Infreq) | 0.00 | 0.01 | -0.05 | 0.965 | |
| Type of Sentence (Known Vs. Novel) | 0.02 | 0.01 | 2.03 | 0.047 | * |
| Day (Day 3 vs. Day 9) * Syntax | -0.01 | 0.01 | -0.71 | 0.478 | |
| Day (Day 2 vs Day 3&9) * Syntax | -0.01 | 0.01 | -0.47 | 0.639 | |
| Day (Day 3 vs. Day 9) * Verb | 0.01 | 0.01 | 0.42 | 0.672 | |
| Day (Day 2 vs Day 3&9) * Verb | -0.03 | 0.01 | -2.79 | 0.005 | ** |
| Syntax * Verb | -0.02 | 0.01 | -2.00 | 0.045 | * |
| Day (Day 3 vs. Day 9) * Type of Sentence (Freq Vs. Infreq) | 0.02 | 0.02 | 1.53 | 0.127 | |
| Day (Day 2 vs Day 3&9) * Type of Sentence (Freq Vs. Infreq) | 0.00 | 0.01 | -0.05 | 0.961 | |
| Day (Day 3 vs. Day 9) * Type of Sentence (Known Vs. Novel) | 0.02 | 0.01 | 1.53 | 0.126 | |

| | | | | | |
|-------------------------------------------------------------------------------------|--------------|-------------|--------------|--------------|----|
| Day (Day 2 vs Day 3&9) * Type of Sentence (Known Vs. Novel) | 0.01 | 0.02 | 0.84 | 0.404 | |
| Syntax * Type of Sentence (Freq Vs. Infreq) | 0.00 | 0.01 | 0.17 | 0.869 | |
| Syntax * Type of Sentence (Known Vs. Novel) | 0.00 | 0.01 | -0.05 | 0.963 | |
| Verb * Type of Sentence (Freq Vs. Infreq) | -0.01 | 0.01 | -0.74 | 0.461 | |
| Verb * Type of Sentence (Known Vs. Novel) | 0.02 | 0.01 | 2.10 | 0.036 | * |
| Day (Day 3 vs. Day 9) * Syntax * Verb | 0.03 | 0.03 | 1.11 | 0.268 | |
| Day (Day 2 vs Day 3&9) * Syntax * Verb | -0.01 | 0.02 | -0.64 | 0.522 | |
| Day (Day 3 vs. Day 9) * Syntax * Type of Sentence (Freq Vs. Infreq) | -0.01 | 0.03 | -0.22 | 0.823 | |
| Day (Day 2 vs Day 3&9) * Syntax *Type of Sentence (Freq Vs. Infreq) | -0.01 | 0.03 | -0.23 | 0.816 | |
| Day (Day 3 vs. Day 9) * Syntax * Type of Sentence (Known Vs. Novel) | 0.00 | 0.03 | -0.13 | 0.896 | |
| Day (Day 2 vs Day 3&9) * Syntax * Type of Sentence (Known Vs. Novel) | 0.00 | 0.03 | 0.17 | 0.863 | |
| Day (Day 3 vs. Day 9) * Verb * Type of Sentence (Freq Vs. Infreq) | -0.02 | 0.03 | -0.71 | 0.479 | |
| Day (Day 2 vs Day 3&9) * Verb *Type of Sentence (Freq Vs. Infreq) | 0.02 | 0.03 | 0.77 | 0.444 | |
| Day (Day 3 vs. Day 9) * Verb * Type of Sentence (Known Vs. Novel) | -0.01 | 0.03 | -0.44 | 0.661 | |
| Day (Day 2 vs Day 3&9) * Verb * Type of Sentence (Known Vs. Novel) | 0.07 | 0.03 | 2.80 | 0.005 | ** |
| Syntax * Verb * Type of Sentence (Freq Vs. Infreq) | 0.05 | 0.03 | 1.84 | 0.066 | . |

| | | | | |
|-----------------------------------------------------------------------------|--------------|-------------|--------------|--------------|
| Syntax * Verb * Type of Sentence (Known Vs. Novel) | -0.01 | 0.02 | -0.46 | 0.643 |
| Day (Day 3 vs. Day 9) * Syntax * Verb * Type of Sentence (Freq Vs. Infreq) | 0.07 | 0.06 | 1.06 | 0.292 |
| Day (Day 2 vs Day 3&9) * Syntax * Verb * Type of Sentence (Freq Vs. Infreq) | -0.03 | 0.05 | -0.62 | 0.535 |
| Day (Day 3 vs. Day 9) * Syntax * Verb * Type of Sentence (Known Vs. Novel) | 0.01 | 0.06 | 0.26 | 0.793 |
| Day (Day 2 vs Day 3&9) * Syntax * Verb * Type of Sentence (Known Vs. Novel) | 0.05 | 0.05 | 0.92 | 0.357 |

N= 14367

.<.1 *<.05, **<.01 ***<.001

Description of further effects not described in the main text:

Participants were slower on Day 2 than on the following days ($\beta=.49$, $SE=.04$, $t=11.6$, $p<.001$). This is partly due to the slightly different structure of the trials on Day 2 (see Methods). There was a main effect of Type of Sentence ($\beta=.02$, $SE=.01$, $t=2.0$, $p=.047$) as participants were slightly faster on the known compared to the new structures.

The verb repetition effect was larger on Day 2 than on the following days ($\beta=-.03$, $SE=.01$, $t=-2.0$, $p=.005$) as well as larger for the novel structures than for the known one ($\beta=.02$, $SE=.01$, $t=2.1$, $p=.036$), this might be driven by a stronger saliency for the verb, in either first or last position in the sentence for the new structures compared to the middle position for the known structure. This stronger verb repetition effect for the novel structures was mainly present on Day 2 as evidenced by a three-way interaction between Day, Verb and Type of Sentence ($\beta=.07$, $SE=.03$, $t=2.8$, $p=.005$).

Table S2 Summary of fixed effects for the overall reading times on Day 2. The main contrasts of interests are marked in bold.

| Predictor | Coefficient | SE | t | p | |
|-----------------------------------------------------------|--------------------|-------------|--------------|------------------|------------|
| Intercept | 2.77 | 0.06 | 45.25 | <0.001 | *** |
| Syntax | -0.01 | 0.01 | -2.62 | 0.009 | ** |
| Verb | -0.04 | 0.01 | -7.14 | <0.001 | *** |
| Type of Sentence (Freq Vs. Infreq) | 0.00 | 0.01 | -0.08 | 0.941 | |
| Type of Sentence (Known Vs. Novel) | 0.03 | 0.02 | 1.71 | 0.089 | . |
| Syntax * Verb | -0.01 | 0.01 | -1.46 | 0.144 | |
| Syntax * Type of Sentence (Freq Vs. Infreq) | 0.00 | 0.01 | -0.02 | 0.985 | |
| Syntax * Type of Sentence (Known Vs. Novel) | 0.00 | 0.01 | 0.21 | 0.832 | |
| Verb * Type of Sentence (Freq Vs. Infreq) | 0.00 | 0.01 | 0.13 | 0.895 | |
| Verb * Type of Sentence (Known Vs. Novel) | 0.04 | 0.01 | 2.92 | 0.004 | ** |
| Syntax * Verb * Type of Sentence (Freq Vs. Infreq) | 0.01 | 0.01 | 0.56 | 0.577 | |
| Syntax * Verb * Type of Sentence (Known Vs. Novel) | 0.01 | 0.01 | 0.40 | 0.692 | |

N= 5645

.<.1 *<.05, **<.01 ***<.001

Description of further effects not described in the main text:

The interaction between Type of Sentence (known versus new) and Verb ($\beta=.04$, $SE=.01$, $t=2.9$, $p=.004$), is due to participants showing a larger verb repetition effect for the new structures. This might be driven by a stronger saliency for the verb, in either first or last position in the sentence for the new structures compared to the middle position for the old structures.

Table S3 Summary of fixed effects for the response choices on Day 3 and 9. The main contrasts of interests are marked in bold.

| Predictor | Coefficient | SE | Wald Z | p | |
|--------------------------------------------------|--------------------|-------------|---------------|-----------------|------------|
| Intercept | 2.12 | 0.16 | 13.23 | <.001 | *** |
| Day | 0.61 | 0.23 | 2.64 | 0.01 | ** |
| Verb | 0.24 | 0.06 | 3.82 | <.001 | *** |
| Syntax | 0.38 | 0.07 | 5.43 | <.001 | *** |
| Type of Sentence (Freq Vs. Infreq) | -0.13 | 0.10 | -1.41 | 0.16 | |
| Type of Sentence (Known Vs. Novel) | 0.04 | 0.17 | 0.23 | 0.82 | |
| Day*Verb | 0.23 | 0.13 | 1.85 | 0.06 | . |
| Day*Syntax | -0.39 | 0.13 | -2.95 | <.001 | ** |
| Verb*Syntax | 0.23 | 0.13 | 1.83 | 0.07 | . |
| Day*Type of Sentence (Freq Vs. Infreq) | -0.24 | 0.17 | -1.41 | 0.16 | |
| Day*Type of Sentence (Known Vs. Novel) | -0.20 | 0.16 | -1.26 | 0.21 | |
| Verb*Type of Sentence (Freq Vs. Infreq) | -0.08 | 0.15 | -0.49 | 0.62 | |
| Verb*Type of Sentence (Known Vs. Novel) | 0.23 | 0.13 | 1.71 | 0.09 | . |
| Syntax*Type of Sentence (Freq Vs. Infreq) | 0.32 | 0.15 | 2.07 | 0.04 | * |
| Syntax*Type of Sentence (Known Vs. Novel) | 0.36 | 0.14 | 2.56 | 0.01 | * |
| Day*Verb*Syntax | -0.52 | 0.25 | -2.06 | 0.04 | * |
| Day*Verb*Type of Sentence (Freq Vs. Infreq) | -0.39 | 0.31 | -1.26 | 0.21 | |
| Day*Verb*Type of Sentence (Known Vs. Novel) | -0.16 | 0.27 | -0.59 | 0.55 | |

| | | | | | |
|-------------------------------------------------------|--------------|-------------|--------------|-----------------|------------|
| Day*Syntax*Type of Sentence (Freq Vs. Infreq) | 0.29 | 0.31 | 0.96 | 0.34 | |
| Day*Syntax*Type of Sentence (Known Vs. Novel) | -0.02 | 0.27 | -0.08 | 0.94 | |
| Verb*Syntax*Type of Sentence (Freq Vs. Infreq) | 0.39 | 0.31 | 1.28 | 0.20 | |
| Verb*Syntax*Type of Sentence (Known Vs. Novel) | 0.98 | 0.27 | 3.64 | <.001 | *** |
| Day*Verb*Syntax*Type of Sentence (Freq Vs. Infreq) | 0.47 | 0.61 | 0.77 | 0.44 | |
| Day*Verb*Syntax*Type of Sentence (Known Vs. Novel) | 0.89 | 0.54 | 1.66 | 0.10 | . |

N= 10290

.<.1 *<.05, **<.01 ***<.001

Description of further effects not described in the main text:

Participants improved in making the correct choice from Day 3 to Day 9 ($\beta=.61$, $SE=.23$, $Z=2.64$, $p=.01$).

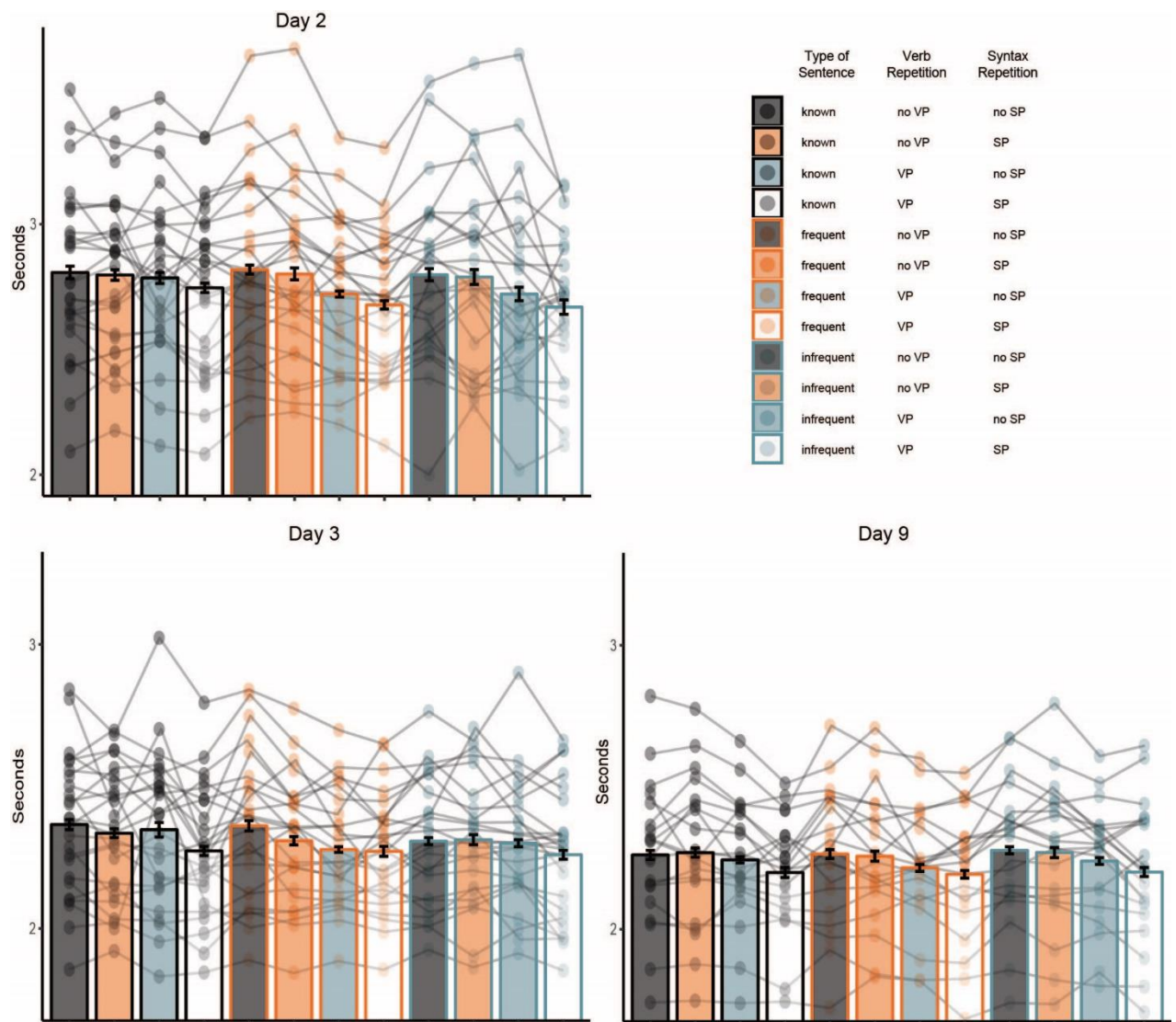


Figure S1. Total reading times per day and condition. The error bars show the standard error of the mean. Dots and lines represent individual subjects' performance.

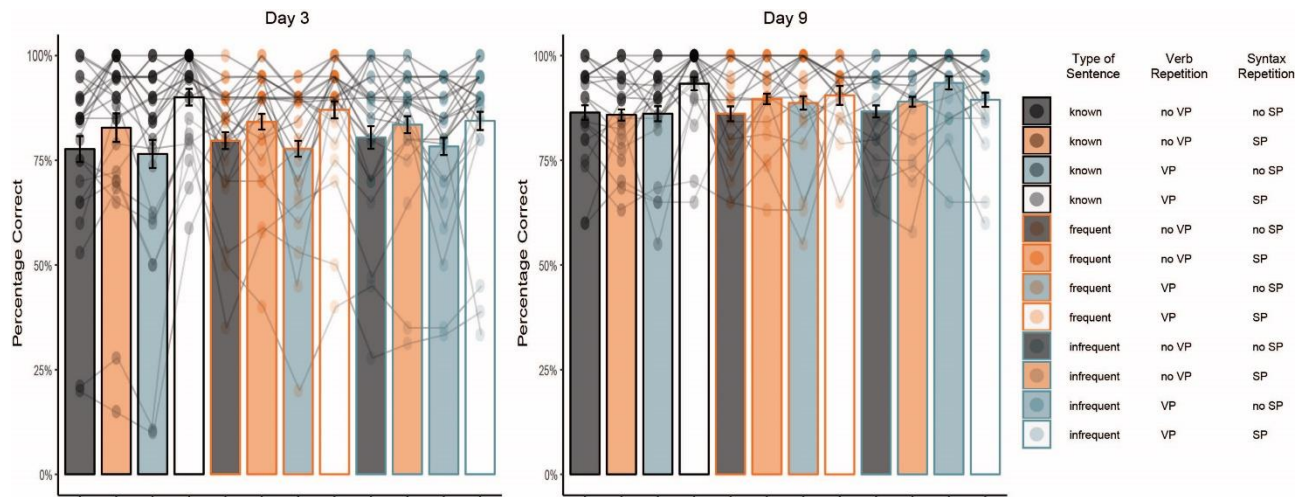


Figure S1. Response choices per day and condition. The error bars show the standard error of the mean. Dots and lines represent individual subjects' performance.