**Supplementary Materials (S1) Full set of stimuli**

**Table S1.1:** List of learning stimuli.

| **Type** | **Hebrew Word** | **Hebrew IPA** | **Arabic Translation** | **Arabic IPA** | **Meaning** | **Cross FC IPA** | **Meaning of Cross FC** |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Cognate | מכתב | mixtav | مكتوب | maktu:b | letter | - | - |
|  | ספינה | sfina | سفينة | safi:na | ship | - | - |
|  | בריכה | brexa | بركة | burka | pool | - | - |
|  | גבינה | gvina | جبنة | dʒubna | cheese | - | - |
|  | סבון | sabon | صابون | sˤa:bu:n | soap | - | - |
|  | עין | ʕajin | عين | ʕajn | eye | - | - |
|  | מפתח | mafteaħ | مفتاح | mufta:ħ | key | - | - |
|  | אצבע | ʔetsbaʕ | إصبع | ʔisˤbaʕ | finger | - | - |
|  | בטן | beten | بطن | batˤn | stomach | - | - |
|  | גזר | gezer | جزر | dʒazar | carrots | - | - |
|  | רחם | reħem | رحم | raħm | womb | - | - |
|  | דם | dam | دم | damm | blood | - | - |
|  | רגל | regel | رجل | ridʒl | leg | - | - |
|  | אוזן | ʔozen | أذن | ʔuðn | ear | - | - |
| FC | רוח | [ruaħ](https://en.wikipedia.org/wiki/Voiceless_pharyngeal_fricative) | نسيم | nasi:m | breeze | nisim | miracles |
|  | תוכנית | toxnit | منهاج | minha:dʒ | curriculum | minhag | custom |
|  | אפרוח | ʔefroaħ | صوص | sˤu:sˤ | chick | sus | horse |
|  | דבורה | dvora | نحل | naħl | bee | naħal | stream |
|  | ערימה | ʕarima | كومة | kawma | pile | koma | floor |
| FC | כיתה | kita | صف | sˤaff | classroom | saf | threshold |
|  | עונה | ʕona | فصل | fasˤl | season | pesel | statue |
|  | בשר | basar | لحم | laħm | meat | leħem | bread |
|  | תמונה | tmuna | صورة | sˤu:ra | picture | ʃura | row |
|  | כלה | kala | عروس | ʕaru:s | bride | ʔarus | fiancé |
|  | דמיון | dimjon | خيال | xaja:l | imagination | ħajal | soldier |
|  | כרוב | kruv | ملفوف | malfu:f | cabbage | melafefon | cucumber |
|  | אפס | ʔefes | صفر | sˤifr | zero | sefer | book |
|  | גישה | giʃa | نهج | nahdʒ | approach | nahag | driver |
| Control | מאמר | maʔmar | مقال | maqa:l | article | - | - |
|  | שזיף | ʃezif | خوخ | xawx | plum | - | - |
|  | בננה | banana | موز | mawz | banana | - | - |
|  | עוגה | ʕuga | كعكة | kaʕka | cake | - | - |
|  | אישה | ʔiʃa | زوجة | zawdʒa | wife | - | - |
|  | גוזל | gozal | فرخ | farx | nestling | - | - |
|  | מגף | magaf | جزمه | dʒazma | boot | - | - |
|  | אדמה | ʔadama | ارض | ʔardˤ | land | - | - |
|  | במה | bama | مسرح | masraħ | stage | - | - |
|  | איש | ʔiʃ | شخص | ʃaxsˤ | person | - | - |
|  | עץ | ʕets | شجرة | ʃadʒara | tree | - | - |
|  | ארוחה | ʔaruħa | وجبة | wadʒba | meal | - | - |
|  | אש | ʔeʃ | نار | na:r | fire | - | - |
| Control | עישון | ʕiʃun | تدخين | tadxi:n | smoking | - | - |
|  | קן | ken | عش | ʕiʃʃ | nest | - | - |
|  | כוויה | kvija | حُرق | ħurq | burn | - | - |
|  | סיפור | sipur | قصة | qisˤsˤa | story | - | - |
|  | גלידה | glida | بوظه | bu:ðˤa | ice cream | - | - |
|  | גופה | gufa | جثة | dʒuθθa | corpse | - | - |
|  | אריה | ʔarje | اسد | ʔasad | lion | - | - |
|  | עמק | ʕemek | وادي | wa:di: | valley | - | - |
|  | הרצאה | hartsaʔa | محاضره | muħa:dˤara | lecture | - | - |
|  | נכד | nexed | حفيد | ħafi:d | grandchild | - | - |
|  | חול | ħol | رمل | raml | sand | - | - |
|  | אגם | ʔagam | بحيرة | buħajra | lake | - | - |
|  | מקרר | mekarer | براد | barra:d | refrigerator | - | - |
|  | חרקים | ħarakim | حشرات | ħaʃara:t | insects | - | - |
|  | הסכמה | haskama | موافقه | muwa:faqa | agreement | - | - |

*Note*: FC refers to false-cognates. Cross FC refers to the Hebrew word which overlaps in form but not in meaning with the false-cognate. IPA refers to The International Phonetic Alphabet. Note that Arabic orthography or IPA representations were never presented during the experiment.

**Table S1.2:** List of stimuli included in the lexical decision task

| **Type** | **Hebrew word** | **Hebrew IPA** | **Arabic Translation** | **Arabic IPA** | **Hebrew Meaning** |
| --- | --- | --- | --- | --- | --- |
| Cognate | **מכתב** | mixtav | مكتوب | maktu:b | letter |
|  | **ספינה** | sfina | سفينة | safi:na | ship |
|  | **בריכה** | brexa | بركة | burka | pool |
|  | **גבינה** | gvina | جبنة | dʒubna | cheese |
|  | **סבון** | sabon | صابون | sˤa:bu:n | soap |
|  | **עין** | ʕajin | عين | ʕajn | eye |
|  | **מפתח** | mafteaħ | مفتاح | mufta:ħ | key |
|  | **אצבע** | ʔetsbaʕ | إصبع | ʔisˤbaʕ | finger |
|  | **בטן** | beten | بطن | batˤn | stomach |
|  | **גזר** | gezer | جزر | dʒazar | carrots |
|  | **רחם** | reħem | رحم | raħm | womb |
|  | **דם** | dam | دم | damm | blood |
|  | **רגל** | regel | رجل | ridʒl | leg |
|  | **אוזן** | ʔozen | أذن | ʔuðn | ear |
| Cross FC | **ניסים** | nisim | عجائب | ʕadʒa:ʔib | miracles |
|  | **מנהג** | minhag | تقليد | taqli:d | custom |
|  | **סוס** | sus | حصان | ħisˤa:n | horse |
|  | **נחל** | naħal | جدول | dʒadwal | stream |
|  | **קומה** | koma | طابق | tˤa:biq | floor |
|  | **סף** | saf | درجة | daradʒa | threshold |
|  | **פסל** | pesel | تمثال | timθa:l | statue |
| Cross FC | **לחם** | leħem | خبز | xubz | bread |
|  | **שורה** | ʃura | سطر | satˤr | row |
|  | **ארוס** | ʔarus | خطيب | xatˤi:b | fiancé |
|  | **חייל** | ħajal | جندي | dʒundi | soldier |
|  | **מלפפון** | melafefon | خيار | xija:r | cucumber |
|  | **ספר** | sefer | كتاب | kita:b | book |
|  | **נהג** | nahag | سائق | sa:ʔiq | driver |
| Control words | **מאמר** | maʔmar | مقال | maqa:l | article |
|  | **בננה** | banana | موز | mawz | banana |
|  | **עוגה** | ʕuga | كعكة | kaʕka | cake |
|  | **אישה** | ʔiʃa | زوجة | zawdʒa | wife |
|  | **גוזל** | gozal | فرخ | farx | nestling |
|  | **אדמה** | ʔadama | ارض | ʔardˤ | land |
|  | **במה** | bama | مسرح | masraħ | stage |
|  | **איש** | ʔiʃ | شخص | ʃaxsˤ | person |
|  | **ארוחה** | ʔaruħa | وجبة | wadʒba | meal |
|  | **אש** | ʔeʃ | نار | na:r | fire |
|  | **עישון** | ʕiʃun | تدخين | tadxi:n | smoking |
|  | **כוויה** | kvija | حُرق | ħurq | burn |
|  | **סיפור** | sipur | قصة | qisˤsˤa | story |
|  | **גלידה** | glida | بوظه | bu:ðˤa | ice cream |
|  | **שזיף** | ʃezif | خوخ | xawx | plum |
| Control words | **אריה** | ʔarje | اسد | ʔasad | lion |
|  | **עמק** | ʕemek | وادي | wa:di: | valley |
|  | **הרצאה** | hartsaʔa | محاضره | muħa:dˤara | lecture |
|  | **חול** | ħol | رمل | raml | Sand |
|  | **אגם** | ʔagam | بحيرة | buħajra | lake |
|  | **מקרר** | mekarer | براد | barra:d | refrigerator |
|  | **חרקים** | ħarakim | حشرات | ħaʃara:t | insects |
|  | **הסכמה** | haskama | موافقه | muwa:faqa | agreement |
|  | **מגף** | magaf | جزمه | dʒazma | boot |
| Fillers | משרתת | meʃaretet | خادمة | xa:dima | servant |
|  | מפלגה | miflaga | حزب | ħizb | political party |
|  | ציור | tsijur | رسمة | rasma | painting |
|  | שמחה | simħa | فرح | faraħ | happiness |
|  | נתיב | nativ | مسار | masa:r | path |
|  | מחסה | maħase | مأوى | maʔwa | shelter |
|  | צוות | tsevet | طاقم | tˤa:qam | staff |
|  | פאב | pab | حانة | ħa:na | pub |
|  | נתח | netaħ | حصة | ħusˤsˤa | chunk |
|  | אומן | ʔuman | فنان | fanna:n | artist |
|  | פגיעה | pgiʕa | اصابة | ʔisˤa:ba | wound |
|  | תנודה | tnuda | ذبذبة | ðabðaba | vibration |
|  | שריר | ʃrir | عضل | ʕadˤal | muscle |
|  | חוף | ħof | شاطئ | ʃa:tˤiʔ | beach |
|  | מקהלה | makhela | جوقة | dʒawqa | choir |
|  | פרי | pri | ثمار | θima:r | fruit |
|  | הצגה | hatsaga | عرض | ʕardˤ | show |
|  | ענף | ʕanaf | فرع | firʕ | branch |
| Filler ambiguous | מפה | mapa | 1. خريطة | 1. xari:tˤa | 1. map |
|  |  | 2. غطاء طاولة | 2. ɣ:tˤa:ʔ tˤa:wila | 2. tablecloth |
|  | מנה | mana | 1. وجبة | 1. wadʒba | 1. meal |
|  |  | 2. حصة | 2. ħusˤsˤa | 2. portion |
|  | אח | ʔaħ | 1. اخ | 1. ʔaxx | 1. brother |
|  |  |  | 2. ممرض | 2. mumarrid | 2. nurse |
|  | הדחה | hadaħa | 1. فصل | 1. fasˤl | 1. dismissal |
|  |  |  | 2. جلي | 2. dʒali | 2. washing |
|  | הנחה | hanaħa | 1. تخفيض | 1. taxfi:dˤ | 1. sale |
|  |  |  | 2. وضع | 2. wadˤʕ | 2. put down |
|  | חלל | ħalal | 1. فضاء | 1. fadˤa:ʔ | 1. outer space |
|  |  |  | 2. فراغ | 2. fara:ɣ | 2. emptiness |
|  | טיפוס | tipus | 1. نوع | 1. nawʕ | 1. type |
|  |  |  | 2. تسلق | 2. tasalluq | 2. climbing |
|  | סרט | seret | 1. فيلم | 1. film | 1. movie |
|  |  |  | 2. شريط | 2. ʃari:tˤ | 2. ribbon |
|  | עמודים | ʕamudim | 1. صفحات | 1. sˤafaħa:t | 1. pages |
|  |  |  | 2. أعمدة | 2. ʔaʕmida | 2. columns |
|  | עצב | ʕetsev | 1. عصب | 1. ʕasˤab | 1. nerve |
|  |  |  | 2. حزن | 2. ħuzn | 2. sadness |
|  | רווח | revaħ | 1. مسافة | 1. masa:fa | 1. space |
|  |  |  | 2. ربح | 2. ribħ | 2. gain |
|  | רוק | rok | 1. لعاب | 1. luʕa:b | 1. saliva |
|  |  |  | 2. روك | 2. rokk | 2. rock music |
|  | רימון | rimon | 1. رمان | 1. rumma:n | 1.pomegranate |
|  |  |  | 2. قنبلة | 2. qunbula | 2. grenade |
|  | שיח | sijaħ | 1. حوار | 1. ħiwa:r | 1. discourse |
|  |  |  | 2. شجيرة | 2. ʃudʒajra | 2. bush |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Non-words:** | | | | | |
| פזחם | מקחשם | חרמר | צערנית | בוד | קלרית |
| צקלם | בחקת | לזמבש | גליחות | ריד | קישמון |
| פחשן | פחקם | רעבפש | חקשיר | מכו | הנדנים |
| קדרן | צבקת | עקרק | גיברון | מון | במד |
| נקלם | מבכרש | ואטלה | חזרית | לת | קגלת |
| שקמר | קשביר | לושאח | רגותש | נקו | פרדין |
| קרמד | מלזה | צרגן | השגעים | הור | מלר |
| לחבן | רקעק | צלקן | לימוק | ביור | צביל |
| גלבד | עיאפה | בחצת | גים | זישה | ביח |
| בחלץ | חמחון | קלעמה | סאור | בוד | שגון |
| פעקש | מרפמש | צלפק | תרשול | דול | עחון |
| צמעם | מחמקש | גשינות | מיר | מרן | זג |
| התפמז | קרבס | רדותל | במח | כים | רל |
| מסגבת | שקמיר | משפטע | גח | ניה | נקס |

*Note*: \* Words that were learned during the learning protocol appear in bold.

**Supplementary Materials (S2) – Summary CHaracteristics of Stimuli in the Lexical Decision TAsk**

**Table S2.1:** Mean item characteristics as a function of word type.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Word Type** | | | |
| **Measure** | Cognates | False-Cognates | Control | Fillers |
| Number of items | 14 | 14 | 24 | 32 |
| Hebrew length in letters | 3.71 (0.91) | 3.64 (1.01) | 4.00 (0.89) | 3.84 (0.92) |
| Hebrew length in syllables | 2.00 (0.39) | 2.00 (0.68) | 2.21 (0.66) | 2.09 (0.73) |
| Hebrew frequency | 32.64 (31.44) | 42.50 (75.21) | 42.28 (59.50) | 27.26 (24.79) |
| Bigram Frequency | 0.002 (0.001) | 0.002 (0.002) | 0.002 (0.002) | 0.002 (0.002) |
| Trigram Frequency | 0.0002 (0.0002) | 0.0002 (0.0002) | 0.0002 (0.0002) | 0.0002 (0.0002) |

*Note*: There were no significant differences among the word types based on a one-way Anova in any of the measures (all *Fs*<1). Standard deviations appear in parenthesis. Hebrew frequency is based on heTenTen 2014 corpus via SketchEngine (Kilgarriff et al., 2014; Kilgarriff, Reddy, Pomikálek, & Avinesh, 2010). Bigram and Trigram frequencies are based on a corpus of 12 million words from a collection of articles from the Hebrew newspaper *Haaretz* (see also Peleg et al., 2019).

**Table S2.2:** Mean item characteristics as a function lexicality

|  |  |  |
| --- | --- | --- |
|  | **Word Type** | |
| **Measure** | Words | Non-Words |
| Number of items | 84 | 84 |
| Hebrew length in letters | 3.83 (0.92) | 4.05 (0.92) |
| Hebrew length in syllables | 2.10 (0.65) | 2.06 (0.67) |
| Bigram Frequency | 0.002 (0.002) | 0.002 (0.002) |
| Trigram Frequency | 0.0002 (0.0002) | 0.0001 (0.0002) |

*Note*: There were no significant differences in any of the measures (all *p*s > 0.12) based on independent-sample t-tests. Standard deviations appear in parenthesis. Hebrew frequency is based on heTenTen 2014 corpus via SketchEngine (Kilgarriff et al., 2014; Kilgarriff, Reddy, Pomikálek, & Avinesh, 2010). Bigram and Trigram frequencies are based on a corpus of 12 million words from a collection of articles from the Hebrew newspaper *Haaretz* (see also Peleg et al., 2019).

**Supplementary Materials (S3) – Details of Models from the *ANOVA* function**

**Table S3.1**. Anova summary table for the effect of Word Type within and across Cycles.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | **Measure** | | | | | | | | | | | |
| **Cyc.** |  | **Error Rate Production** | | | | | |  | **Log RT Recognition** | | | | |
|  | **Fixed effect** | *df* | *MSS* | *F* | *P(F)* |  | *MSS* | | | *Df1* | *Df2* | *F* | *P(F)* |
| 1 | Word Type | 2 | 16.86 | 16.86 | <0.001\*\*\* |  | 3.95 | | | 2 | 58.11 | 23.66 | <.001\*\*\* |
| 2 | Word Type | 2 | 14.30 | 14.30 | <0.001\*\*\* |  | 4.37 | | | 2 | 59.53 | 27.82 | <.001\*\*\* |
| 3 | Word Type | 2 | 8.74 | 8.74 | <0.001\*\*\* |  | 5.23 | | | 2 | 54.69 | 27.49 | <.001\*\*\* |
| 4 | Word Type | 2 | 7.25 | 7.25 | <0.001\*\*\* |  | 2.57 | | | 2 | 52.47 | 16.69 | <.001\*\*\* |
| Across | Word Type | 2 | 17.65 | 17.65 | <0.001\*\*\* |  | 5.81 | | | 2 | 60.73 | 34.69 | <.001\*\*\* |
|  | Cycle | 2 | 28.27 | 28.27 | <0.001\*\*\* |  | 2.66 | | | 2 | 49.77 | 15.87 | <.001\*\*\* |

*Note*: ± *p*<0.1 \* *p*< .05; \*\* *p*<0.01; \*\*\* *p*<0.001

**Table S3.2**. Anova summary tables for the effects of Individual Differences and Word Type within each cycle.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | |  | **Measure** | | | | | | | | | | | |
| **Cyc.** | |  | **Error Rate** | | | | | | | **Log RT** | | | | |
|  | **Fixed effect** | | | *df* | *MSS* | *F* | *P(F)* |  | *MSS* | | *Df1* | *Df2* | *F* | *P(F)* | |
| 1 | Word Type | | | 2 | 16.63 | 16.63 | <0.001\*\*\* |  | 3.94 | | 2 | 58.15 | 23.65 | <.001\*\*\* | |
|  | Phonological STM | | | 1 | 16.09 | 16.09 | <0.001\*\*\* |  | - | | - | - | - | - | |
|  | L1 Verbal Fluency | | | - | - | - | - |  | 1.26 | | 1 | 53.83 | 7.54 | 0.008\*\* | |
| 2 | Word Type | | | 2 | 10.61 | 10.61 | <.001\*\*\* |  | 4.62 | | 2 | 55.33 | 28.89 | <.001\*\*\* | |
|  | Phonological STM | | | 1 | 2.26 | 2.26 | 0.13 |  | 0.02 | | 1 | 37.24 | 0.12 | 0.73 | |
|  | L1 Verbal Fluency | | | - | - | - | - |  | 0.12 | | 1 | 37.09 | 0.76 | 0.39 | |
|  | L1 use | | | 1 | 6.54 | 6.54 | 0.01\* |  | - | | - | - | - | - | |
|  | Word Type: Phonological STM | | | 2 | 2.13 | 2.13 | 0.12 |  | 0.89 | | 2 | 1671.93 | 5.56 | 0.004\*\* | |
|  | Word Type: L1 Verbal Fluency | | | - | - | - | - |  | 0.55 | | 2 | 1671.83 | 3.45 | 0.03\* | |
| 3 | Word Type | | | 2 | 5.95 | 5.95 | 0.003\*\* |  | 5.23 | | 2 | 54.75 | 27.52 | <.001\*\*\* | |
|  | Phonological STM | | | 1 | 0.05 | 0.05 | 0.49 |  | - | | - | - | - | - | |
|  | L1 Verbal Fluency | | | - | - | - | - |  | 1.30 | | 1 | 21.97 | 6.85 | 0.02\* | |
|  | Word Type: Phonological STM | | | 2 | 3.22 | 3.22 | 0.04\* |  | - | | - | - | - | - | |

*Note*: ± *p*<0.1 \* *p*< .05; \*\* *p*<0.01; \*\*\* *p*<0.001. FC refers to false-cognates. Phonological STM refers to phonological short-term memory.

**Supplementary Materials (S4) - Model Summary of Cycles 2, 3, and 4.**

**Table S4.1:** Model summaries for **Cycle 2** (n=37) performance examining the effect of Word Type, with control items set as the reference.

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Error Rate** | | | | | | **Log RT** | | | | |
| **Fixed effect** | *b* | *SE* | *z* | *P(z)* |  | *b* | | *SE* | *df* | *t* | *P(t)* |
| Intercept | -2.21 | 0.32 | -6.95 | <.001\*\*\* |  | 7.56 | | 0.06 | 77.82 | 117.78 | <.001\*\*\* |
| Word Type (Cognate) | -3.21 | 0.60 | -5.39 | <.001\*\*\* |  | -0.58 | | 0.08 | 56.89 | -7.39 | <.001\*\*\* |
| Word Type (FC) | -0.16 | 0.44 | -0.36 | 0.72 |  | -0.10 | | 0.08 | 60.80 | -1.28 | 0.20 |
| **Random effect** | *Variance* | | *SD* | |  | *Variance* | | | *SD* | *Corr.* |  |
| Item (intercept) | 1.40 | | 1.18 | |  | 0.05 | | | 0.22 |  |  |
| Participant (intercept) | 1.25 | | 1.12 | |  | 0.08 | | | 0.28 |  |  |
| Word Type (cognate) | - | | - | |  | 0.01 | | | 0.08 | -0.50 |  |
| Word Type (FC) | - | | - | |  | 0.01 | | | 0.11 | 0.06 | -0.31 |
| Residual | - | | - | |  |  | | |  |  |  |
| **AIC** | 1248.1 | | | |  | 2040.9 | | | | | |
| Intraclass Correlation (Item) | | | 0.24 | |  | 0.18 | | | | | |
| Intraclass Correlation (Participant) | | | 0.21 | |  | 0.28 | | | | | |
| *Note*: ± *p*<0.1 \* *p*< .05; \*\* *p*<0.01; \*\*\* *p*<0.001. Intraclass correlations may not be accurate in the presence of random slopes. The overall ICC for the RT model (adjusted ICC) is 0.45. FC refers to false-cognates. | | | | | | | | | | | |

**Table S4.2:** Model summaries for **Cycle 3** (n=22) performance examining the effect of Word Type, with control items set as the reference.

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Error Rate** | | | | | | **Log RT** | | | | |
| **Fixed effect** | *b* | *SE* | *z* | *P(z)* |  | *b* | | *SE* | *df* | *t* | *P(t)* |
| Intercept | -1.94 | 0.29 | -6.80 | <.001\*\*\* |  | 7.43 | | 0.08 | 44.83 | 98.48 | <.001\*\*\* |
| Word Type (Cognate) | -1.86 | 0.44 | -4.18 | <.001\*\*\* |  | -0.56 | | 0.08 | 54.09 | -7.11 | <.001\*\*\* |
| Word Type (FC) | -0.41 | 0.36 | -1.11 | 0.27 |  | -0.04 | | 0.08 | 55.78 | -0.45 | 0.66 |
| **Random effect** | *Variance* | | *SD* | |  | *Variance* | | | *SD* | *Corr.* |  |
| Item (intercept) | 0.74 | | 0.86 | |  | 0.05 | | | 0.22 |  |  |
| Participant (intercept) | 0.75 | | 0.87 | |  | 0.08 | | | 0.28 |  |  |
| Word Type (cognate) | - | | - | |  | - | | | - |  |  |
| Word Type (FC) | - | | - | |  | - | | | - |  |  |
| Residual | - | | - | |  | 0.19 | | | 0.44 |  |  |
| **AIC** | 837.5 | | | |  | 1399.4 | | | | | |
| Intraclass Correlation Item) | | | 0.15 | |  | 0.15 | | | | | |
| Intraclass Correlation (Participant) | | | 0.16 | |  | 0.25 | | | | | |
| *Note*: ± *p*<0.1 \* *p*< .05; \*\* *p*<0.01; \*\*\* *p*<0.001. FC refers to false-cognates | | | | | | | | | | | |

**Table S4.3:** Model summaries for **Cycle 4** (n=12) performance examining the effect of Word Type, with control items set as the reference.

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Error Rate** | | | | | | **Log RT** | | | | |
| **Fixed effect** | *b* | *SE* | *z* | *P(z)* |  | *b* | | *SE* | *df* | *t* | *P(t)* |
| Intercept | -1.35 | 0.32 | -4.23 | <.001\*\*\* |  | 7.48 | | 0.07 | 34.26 | 104.66 | <.001\*\*\* |
| Word Type (Cognate) | -2.00 | 0.53 | -3.75 | <.001\*\*\* |  | -0.44 | | 0.09 | 50.92 | -5.07 | <.001\*\*\* |
| Word Type (FC) | -0.30 | 0.44 | -0.68 | 0.50 |  | 0.08 | | 0.09 | 54.84 | 0.88 | 0.38 |
| **Random effect** | *Variance* | | *SD* | |  | *Variance* | | | *SD* | *Corr.* |  |
| Item (intercept) | 1.11 | | 1.05 | |  | 0.06 | | | 0.24 |  |  |
| Participant (intercept) | 0.45 | | 0.67 | |  | 0.03 | | | 0.17 |  |  |
| Word Type (cognate) | - | | - | |  | - | | | - |  |  |
| Word Type (FC) | - | | - | |  | - | | | - |  |  |
| Residual | - | | - | |  | 0.15 | | | 0.39 |  |  |
| **AIC** | 592.0 | | | |  | 630.3 | | | | | |
| Intraclass Correlation Item) | | | 0.23 | |  | 0.24 | | | | | |
| Intraclass Correlation (Participant) | | | 0.09 | |  | 0.12 | | | | | |
| *Note*: ± *p*<0.1 \* *p*< .05; \*\* *p*<0.01; \*\*\* *p*<0.001. FC refers to false-cognates | | | | | | | | | | | |

**Supplementary Materials (S5) - Model Summary of Individual Differences by Cycle**

**Table S5.1:** Model summaries for **Cycle 1** (n=54) performance examining individual differences and the effect of Word Type, with control items set as the reference.

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Error Rate** | | | | | | **Log RT** | | | | |
| **Fixed effect** | *b* | *SE* | *z* | *P(z)* |  | *b* | | *SE* | *df* | *t* | *P(t)* |
| Intercept | -1.65 | 0.27 | -6.17 | <.001\*\*\* |  | 7.67 | | 0.06 | 95.09 | 128.05 | <.001\*\*\* |
| Word Type (Cognate) | -2.74 | 0.49 | -5.64 | <.001\*\*\* |  | -0.58 | | 0.09 | 58.46 | -6.74 | <.001\*\*\* |
| Word Type (FC) | -0.21 | 0.41 | -0.51 | 0.61 |  | -0.08 | | 0.09 | 57.41 | -0.90 | 0.37 |
| L1 Verbal Fluency | - | - | - | - |  | -0.09 | | 0.03 | 53.83 | -2.75 | 0.008\*\* |
| L1 Use | - | - | - | - |  | - | | - | - | - | - |
| Phonological STM | -0.51 | 0.13 | -4.00 | <.001\*\*\* |  | - | | - | - | - | - |
| **Random effect** | *Var.* | *SD* |  |  |  | *Var.* | | *SD* | *Corr.* |  |  |
| Item (intercept) | 1.38 | 1.17 |  |  |  | 0.06 | | 0.25 |  |  |  |
| Participant (intercept) | 0.71 | 0.84 |  |  |  | 0.06 | | 0.25 |  |  |  |
| Word Type (Cognate) | - | - |  |  |  | 0.01 | | 0.12 | -0.53 |  |  |
| Word Type (FC) | - | - |  |  |  | 0.01 | | 0.08 | -0.02 | 0.00 |  |
| Residual | - | - |  |  |  | 0.17 | | 0.41 |  |  |  |
| **AIC** | 2103.1 | | | |  | 2923.8 | | | | | |
| Interclass Correlation (Item) | | | 0.26 |  |  | 0.22 | | | | | |
| Interclass Correlation (Participant) | | | 0.13 |  |  | 0.22 | | | | | |

*Note*: ± *p*<0.1 \* *p*< .05; \*\* *p*<0.01; \*\*\* *p*<0.001. FC refers to false-cognates. Phonological STM refers to phonological short-term memory. Intraclass correlations may not be accurate in the presence of random slopes. The overall ICC for RT model (adjusted ICC) is 0.42

**Table S5.2:** Model summaries for **Cycle 2** (n=37) performance examining individual differences and the effect of Word Type, with control items set as the reference.

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Error Rate** | | | | | | **Log RT** | | | | |
| **Fixed effect** | *b* | *SE* | *z* | *P(z)* |  | *b* | | *SE* | *df* | *t* | *P(t)* |
| Intercept | -2.19 | 0.31 | -7.14 | <.001\*\*\* |  | 7.57 | | 0.06 | 84.53 | 120.62 | <.001\*\*\* |
| Word Type (Cognate) | -3.49 | 0.69 | -5.10 | <.001\*\*\* |  | -0.58 | | 0.08 | 54.73 | -7.51 | <.001\*\*\* |
| Word Type (FC) | -0.14 | 0.44 | -0.31 | 0.75 |  | -0.11 | | 0.08 | 56.18 | -1.40 | 0.17 |
| L1 Verbal Fluency | - | - | - | - |  | -0.07 | | 0.04 | 40.78 | -1.53 | 0.13 |
| L1 Use | -0.48 | 0.18 | -2.65 | 0.008\*\* |  | - | | - | - | - | - |
| Phonological STM | -0.36 | 0.21 | -1.77 | 0.08± |  | -0.00 | | 0.05 | 40.84 | -0.06 | 0.95 |
| Word Type (Cognate): Phonological STM | 1.09 | 0.49 | 2.19 | 0.03\* |  | 0.03 | | 0.02 | 1672 | 1.07 | 0.29 |
| Word Type (FC): Phonological STM | 0.15 | 0.18 | 0.82 | 0.41 |  | -0.07 | | 0.03 | 1672 | -2.57 | 0.01\* |
| Word Type (Cognate): L1 Verbal Fluency | - | - | - | - |  | 0.03 | | 0.02 | 1672 | 1.48 | 0.14 |
| Word Type (FC): L1 Verbal Fluency | - | - | - | - |  | 0.06 | | 0.02 | 1672 | 2.56 | 0.01\* |
| **Random effect** | *Var.* | *SD* |  |  |  | *Var.* | | *SD* | *Corr.* |  |  |
| Item (intercept) | 1.40 | 1.18 |  |  |  | 0.05 | | 0.22 | - |  |  |
| Participant (intercept) | 0.97 | 0.99 |  |  |  | 0.07 | | 0.27 | - |  |  |
| Word Type (Cognate) | - | - |  |  |  | - | | - | - |  |  |
| Word Type (FC) | - | - |  |  |  | - | | - | - |  |  |
| Residual | - | - |  |  |  | 0.16 | | 0.40 |  |  |  |
| **AIC** | 1241.9 | | | |  | 2039.3 | | | | | |
| Interclass Correlation (item) | | | 0.25 |  |  | 0.18 | | | | | |
| Interclass Correlation (Participant) | | | 0.17 |  |  | 0.25 | | | | | |

*Note*: ± *p*<0.1 \* *p*< .05; \*\* *p*<0.01; \*\*\* *p*<0.001. FC refers to false-cognates. Phonological STM refers to phonological short-term memory.

**Table S5.3:** Model summaries for **Cycle 3** (n=22) performance examining individual differences and the effect of Word Type, with control items set as the reference.

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Error Rate** | | | | | | **Log RT** | | | | |
| **Fixed effect** | *b* | *SE* | *z* | *P(z)* |  | *b* | | *SE* | *df* | *t* | *P(t)* |
| Intercept | -2.00 | 0.29 | -6.88 | <.001\*\*\* |  | 7.40 | | 0.07 | 49.90 | 106.05 | <.001\*\*\* |
| Word Type (Cognate) | -1.90 | 0.47 | -4.01 | <.001\*\*\* |  | -0.56 | | 0.08 | 54.17 | -7.12 | <.001\*\*\* |
| Word Type (FC) | -0.38 | 0.37 | -1.01 | 0.311 |  | -0.04 | | 0.08 | 55.86 | -0.44 | 0.66 |
| L1 Verbal Fluency | - | - | - | - |  | -0.14 | | 0.05 | 21.97 | -2.62 | 0.02\* |
| Phonological STM | -0.26 | 0.25 | -1.06 | 0.29 |  | - | | - | - | - | - |
| Word Type (Cognate): Phonological STM | 1.03 | 0.39 | 2.62 | 0.009\*\* |  | - | | - | - | - | - |
| Word Type (FC): Phonological STM | 0.12 | 0.24 | 0.49 | 0.63 |  | - | | - | - | - | - |
| **Random effect** | *Var.* | *SD* |  |  |  | *Var.* | | *SD* | *Corr.* |  |  |
| Item (intercept) | 0.75 | 0.87 |  |  |  | 0.05 | | 0.22 | - |  |  |
| Participant (intercept) | 0.72 | 0.85 |  |  |  | 0.06 | | 0.24 | - |  |  |
| Word Type (Cognate) | - | - |  |  |  | - | | - | - |  |  |
| Word Type (FC) | - | - |  |  |  | - | | - | - |  |  |
| Residual | - | - |  |  |  | 0.19 | | 0.44 | - |  |  |
| **AIC** | 835.3 | | | |  | 1395.5 | | | | | |
| Interclass Correlation (item) | | | 0.16 |  |  | 0.16 | | | | | |
| Interclass Correlation (Participant) | | | 0.15 |  |  | 0.20 | | | | | |

*Note*: ± *p*<0.1 \* *p*< .05; \*\* *p*<0.01; \*\*\* *p*<0.001. FC refers to false-cognates. Phonological STM refers to phonological short-term memory.

**Supplementary Materials (S6) – Comparisons Across Leanrer and non-Learner Groups**

**Table S6.1**. Background characteristics of the two groups of native Hebrew speakers.

|  |  |  |
| --- | --- | --- |
| Measure | Native Hebrew Leaners | Native Hebrew Non-learners |
| Number of Participants | 43 | 30 |
| Age (in years) | 24.93 (3.85) | 26.38 (4.48) |
| SES - Maternal Education (in years) | 13.93 (3.53) | 14.67 (3.04) |
| Education (in years) | 13.65 (1.96) | 13.87 (1.57) |
| Avg. of L1 (Hebrew) Proficiencya | 9.48 (0.62) | 9.68 (0.48) |
| Avg. of L1 (Hebrew) Useb | 7.73 (1.31) | 7.82 (1.37) |
| Avg. of English Proficiencya | 7.10 (1.26) | 7.41 (0.99) |
| Avg. of English Useb | 6.30 (1.61) | 6.31 (1.61) |

*Note*: aLanguage proficiency reflects the average proficiency ratings in reading, writing, talking, and speech comprehension rated on a scale of 0 (lowest) to 10 (highest). bLanguage use reflects the average use in reading, writing, conversation, internet, listening, and TV watching rated on a scale from 0 (lowest) to 10 (highest). There were no significant differences between the groups on any of these measures based on independent-sample t-tests with *p*<.05.