

**Table S1. The target binomial phrases selected in the study**

<b>Items (in their preferred word order)</b>	<b>Type</b>
sunrise and sunset	Arabic
coffee and dates	Arabic
land and sea	Arabic
rice and meat	Arabic
prophets and messengers	Arabic
sun and moon	Arabic
heaven and hell	Arabic
hunger and thirst	Arabic
fig and olives	Arabic
poetry and prose	Arabic
seller and buyer	Arabic
camels and sheep	Arabic
individual and society	Arabic
Jews and Christians	Arabic
boys and girls	Congruent
brothers and sisters	Congruent
Adam and Eve	Congruent
success and failure	Congruent
food and drink	Congruent
king and queen	Congruent
profit and loss	Congruent
men and women	Congruent
north and south	Congruent
past and present	Congruent
rich and poor	Congruent
gold and silver	Congruent
strengths and weaknesses	Congruent
reading and writing	Congruent
bride and groom	English
cause and effect	English
fish and chips	English
church and state	English
costs and benefits	English
art and design	English
accident and emergency	English
facts and figures	English
knife and fork	English
law and order	English
rules and regulations	English
salt and pepper	English
pain and suffering	English
trial and error	English
mind and body	Control
town and country	Control
hands and knees	Control
head and shoulders	Control

income and expenditure	Control
indoor and outdoor	Control
time and money	Control
science and education	Control
age and sex	Control
sweet and sour	Control
iron and steel	Control
stocks and shares	Control
urban and regional	Control
words and phrases	Control

**Table S2. Average correct responses in the norming studies across the item types for NSs and NNSs**

Item category	Judgement task		Forward completion		Backward completion	
	NS ( <i>n</i> =13)	NNS ( <i>n</i> =40)	NS ( <i>n</i> =10)	NNS ( <i>n</i> =32)	NS ( <i>n</i> =10)	NNS ( <i>n</i> =11)
Congruent	90.47%	68.93%	94.16%	44.2%	73.57%	27.14%
English-only	100%	51.07%	61.69%	13.84%	52.85%	5.71%
Arabic-only	66.68%	60.90%	48.05%	21.88%	35.00%	7.14%

**Table S3. Example for the item *gold and silver* when presented two and five times in the reading passages**

<b>List</b>	<b>Item</b>	<b>Passage</b>
1	gold and silver	The first time in history currency was exchanged was in the form of gold and silver in 1500 BC. In 1066, the Norman conquerors issued gold and silver coins to use in international trade. In 1285, Venice and England recognized gold and silver as official currency. In 1792, the United States started adapting a gold and silver monetary system that was linked to the value of the dollar. However, converting the dollar into assets such as gold and silver was suspended by President Nixon in 1971.
1	fish and chips	Winston Churchill once described fish and chips as 'the good companions'. England's popular dish of fish and chips first appeared in UK shops in 1860 and was sold by a Jewish immigrant.
2	gold and silver	In 1792, the United States started adapting a gold and silver monetary system that was linked to the value of the dollar. However, converting the dollar into assets such as gold and silver was suspended by President Nixon in 1971.
2	fish and chips	Winston Churchill once described fish and chips as 'the good companions'. England's popular dish of fish and chips first appeared in UK shops in 1860 and was sold by a Jewish immigrant. By the 19th century, the presence of fish and chips shops had increased significantly to meet the demands of a growing industrial population. It started as a popular take-away meal among the British working class, and then later fish and chips became popular among all social classes. Nowadays, the popularity of fish and chips has reached many other English-speaking countries around the world.

**Table S4. Results of model comparisons**

<b>A. Likelihood ratio tests for accuracy</b>		
	<b>Accuracy for experimental items</b>	
<i>Predictors</i>	$\chi^2$	<i>p</i>
Group	45.48	<0.001
Item Type	14.62	<0.001
Session	53.79	<0.001
Familiarity ratings for non-natives	1.38	0.239
Familiarity ratings for natives	7.77	0.005
Length	2.17	0.139
Forward/backward ratio	1.54	0.213

<b>B. Likelihood ratio tests for response time (word order recognition task)</b>		
	<b>RT for experimental items</b>	
<i>Predictors</i>	$\chi^2$	<i>p</i>
Group	37.70	<0.001
Item Type	11.59	0.003
Session	1013.44	<0.001
Familiarity ratings for non-natives	3.08	0.079
Familiarity ratings for natives	0.01	0.930
Length	17.98	<0.001
Forward/backward ratio	0.80	0.368

### **C. Likelihood ratio tests for reading times data (self-paced reading task)**

<i>Predictors</i>	<b>RT</b>	
	$\chi^2$	<i>p</i>
Group	89.85	<0.001
Item Type	0.35	0.841
Reps	1325.32	<0.001
Familiarity ratings for non-natives	1.34	0.247
Familiarity ratings for natives	0.60	0.439
Length	46.79	<0.001
Forward/backward ratio	2.49	0.115
Trial number	261.52	<0.001
Pre-test scores	3.39	0.066
Word Frequency	0.71	0.400

**Table S5. Analysis of accuracy as a function of repetition****A. Means and standard deviations of accuracy scores by repetition**

Group	Repetition	Item Type					
		Arabic		Congruent		English	
		<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
NNS	2	9.81	1.94	11.1	2.27	9.55	2.95
NNS	5	10.10	2.28	11.00	2.25	9.87	2.07
NS	2	9.83	1.98	13.20	1.20	13.60	0.68
NS	5	10.30	2.09	13.10	1.12	13.50	0.76

*Note.* The maximum score was 14.

**B. Model outcome of accuracy scores as a function of repetition**

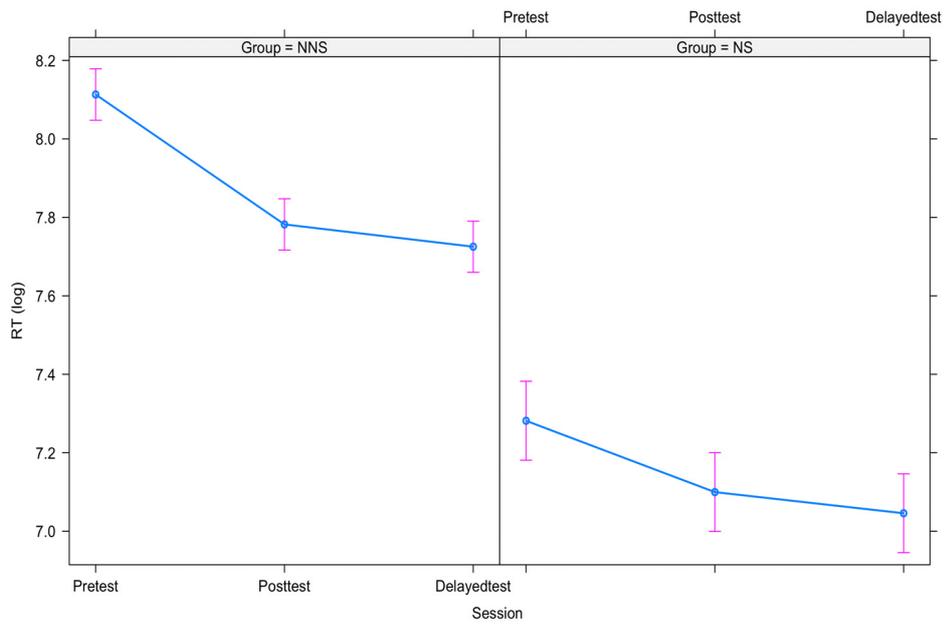
<i>Predictors</i>	Accuracy			
	<i>Estimates</i>	<i>std. Error</i>	<i>Statistic</i>	<i>p</i>
(Intercept)	-3.59	2.24	-1.60	0.110
Group [NS]	0.04	0.17	0.22	0.822
Item Type [Congruent]	-0.09	0.25	-0.35	0.726
Item Type [English]	-0.39	0.27	-1.44	0.150
Session [Delayed test]	-0.38	0.11	-3.43	0.001
Reps [5]	0.08	0.07	1.14	0.256
Familiarity ratings for NNS	0.81	0.56	1.45	0.147
Familiarity ratings for NS	0.37	0.13	2.91	0.004
Group [NS] * Item Type [Congruent]	1.35	0.23	5.90	<0.001
Group [NS] * Item Type [English]	2.61	0.28	9.21	<0.001
Item Type [Congruent] * Session [Delayed test]	0.40	0.17	2.32	0.020
Item Type [English] * Session [Delayed test]	0.29	0.16	1.78	0.076
<b>Random Effects</b>				
$\sigma^2$	3.29			

$\tau_{00}$ subject	0.18
$\tau_{00}$ Item	0.26
ICC	0.12
N subject	65
N Item	42
<hr/>	
Observations	5459
Marginal $R^2$ / Conditional $R^2$	0.180 / 0.278

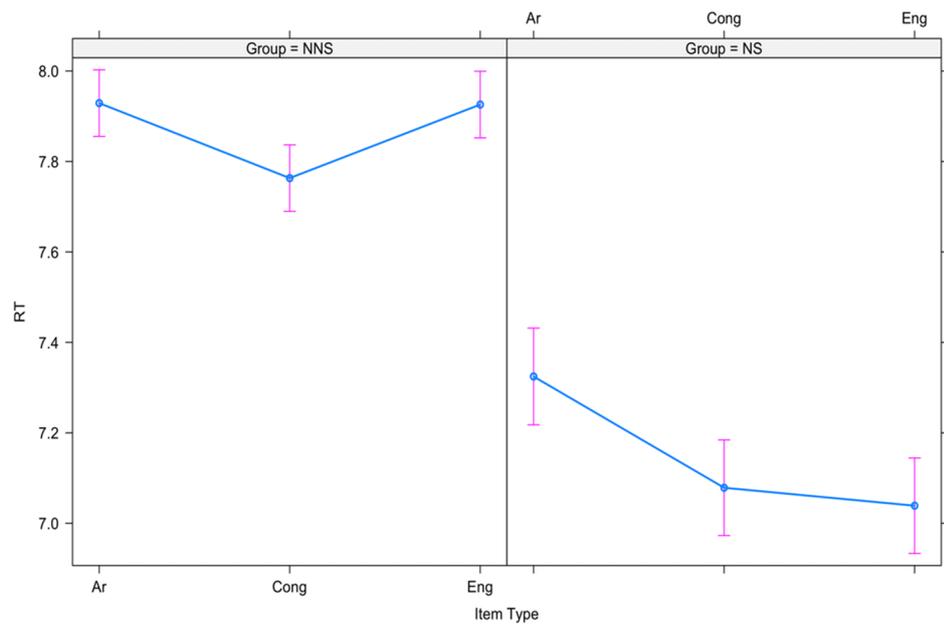
**Table S6. Analysis of response time as a function of test session for experimental and control items**

<i>Predictors</i>	<b>Log RT</b>			
	<i>Estimates</i>	<i>std. Error</i>	<i>Statistic</i>	<i>p</i>
(Intercept)	7.23	0.15	48.74	<0.001
Group [NS]	-0.74	0.06	-12.86	<0.001
Item Type [Arabic]	0.04	0.04	1.01	0.310
Item Type [Congruent]	-0.18	0.03	-5.12	<0.001
Item Type [English]	-0.09	0.04	-2.70	0.007
Session [Post-test]	-0.20	0.02	-10.33	<0.001
Session [Delayed test]	-0.35	0.02	-18.13	<0.001
Length (log)	0.35	0.05	6.49	<0.001
Item Type [Arabic] * Session [Post-test]	-0.13	0.03	-4.64	<0.001
Item Type [Congruent] * Session [Post-test]	-0.07	0.03	-2.76	0.006
Item Type [English] * Session [Post-test]	-0.06	0.03	-2.27	0.023
Item Type [Arabic] * Session [Delayed test]	-0.01	0.03	-0.40	0.689
Item Type [Congruent] * Session [Delayed test]	0.01	0.03	0.34	0.733
Item Type [English] * Session [Delayed test]	0.03	0.03	0.97	0.334
<b>Random Effects</b>				
$\sigma^2$	0.11			
$\tau_{00}$ subject	0.04			
$\tau_{00}$ Item	0.01			
ICC	0.30			

**Figure S1. Interaction between Group and Session**



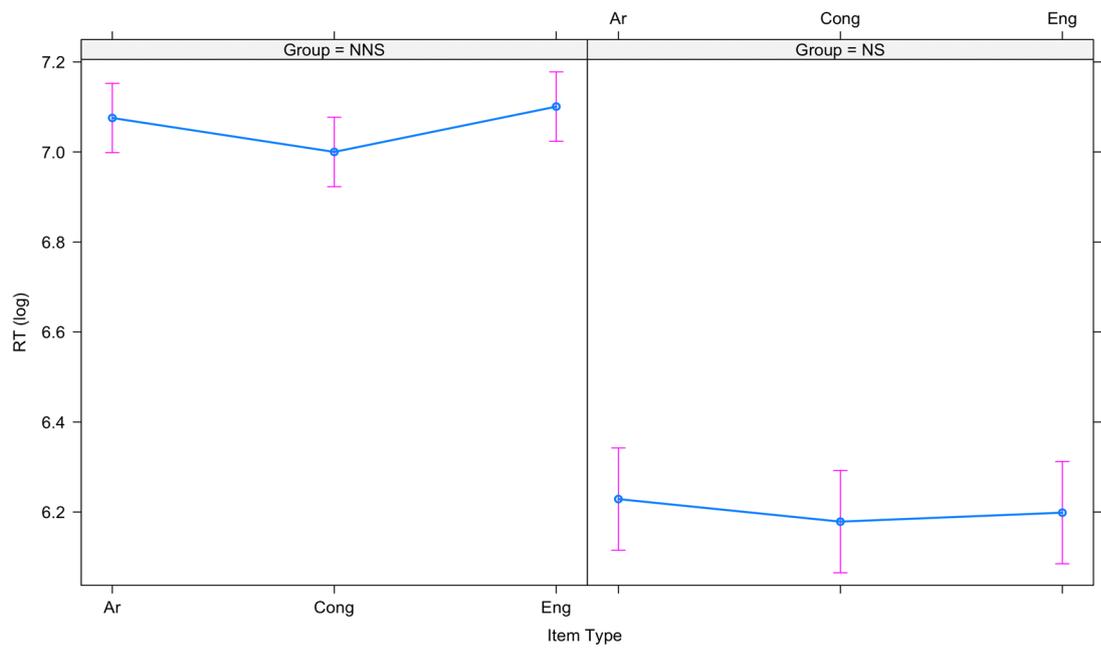
**Figure S2. Interaction between Group and Item Type**



**Table S7. Analysis of response time as a function of repetition**

<i>Predictors</i>	<b>Log RT</b>			
	<i>Estimates</i>	<i>std. Error</i>	<i>Statistic</i>	<i>p</i>
(Intercept)	6.89	0.17	40.68	<0.001
Group [NS]	-0.56	0.07	-8.47	<0.001
Session [Delayed test]	-0.05	0.01	-4.50	<0.001
Item Type [Congruent]	-0.16	0.03	-4.92	<0.001
Item Type [English]	0.01	0.03	0.17	0.866
Length [log]	0.36	0.06	5.78	<0.001
Reps [5]	-0.01	0.01	-1.35	0.179
Group [NS] * Session [Delayed test]	-0.00	0.02	-0.04	0.964
Group [NS] * Item Type [Congruent]	-0.07	0.03	-2.65	0.008
Group [NS] * Item Type [English]	-0.28	0.03	-10.24	<0.001
<b>Random Effects</b>				
$\sigma^2$	0.10			
$\tau_{00}$ subject	0.05			
$\tau_{00}$ Item	0.01			
ICC	0.36			

**Figure S3. Interaction between Group and Item Type in the reading task**



**Figure S4. Interaction between Group and number of repetitions in the reading task**

