

Supplementary Materials Online

Appendix S1: Idioms and control items used in Experiments 1 and 2.

Experiment 1

English idioms	Controls	Chinese idioms	Controls
A chip off the old block	wall	Half believe and half doubt	judge
A pain in the neck	back	Neither three nor four	five
A piece of cake	pie	Draw a snake and add feet	hair
Armed to the teeth	bones	Beat the grass to scare the snake	beast
At the end of the day	hour	Move the tiger away from the mountain	jungle
Bare your soul	core	Chicken feathers and garlic skins	plants
Barking up the wrong tree	bush	One gun and a horse	knife
Be on cloud nine	eight	Can't tell beans from wheat	corn
Below the belt	knee	Doesn't know good from bad	odd
Egg on your face	suit	Eyes bright like torches	mirrors
Get blood from a stone	rock	Three long and two short	small
Get cold feet	hands	Add oil and vinegar	coconut
Left in the dark	cold	Different mouths but one sound	voice
Not my cup of tea	milk	Bare fangs and show claws	anger
On the edge of your seat	chair	Have neither learning nor skill	brains
On the other hand	side	Cover your ears to steal a bell	bike
Raise the roof	wall	Without shirt or shoes	socks
Rock the boat	ship	Love money like life	gold
Spill the beans	chips	Call a deer a horse	sheep
Stab in the back	neck	Wine and meat friends	people
Strapped for cash	coins	Kill the chicken to scare the monkey	donkey
The coast is clear	safe	Chase the wind and grasp at shadows	sunlight
Throw in the towel	bucket	Won't share the same sky	cup
Turn back the clock	years	White clouds change into grey dogs	cats
Under the weather	illness	Keep your mouth shut like a bottle	packet
Wet behind the ears	eyes	Seven mouths and eight tongues	voices

Experiment 2

English idioms

On the edge of your seat
Rock the boat
A chip off the old block
Below the belt
Stab in the back
Spill the beans
At the end of the day
Turn back the clock
A piece of cake
Under the weather
Flog a dead horse
Egg on your face
Left in the dark
Not my cup of tea
A pain in the neck
Throw in the towel
Get cold feet
The coast is clear
Raise the roof
On the other hand

Chinese idioms

Three long and two short
Add oil and vinegar
Call a deer a horse
Bare fangs and show claws
Have neither learning nor skill
Cover your ears to steal a bell
Without shirt or shoes
Love money like life
Different mouths but one sound
Wine and meat friends
Half believe and half doubt
Neither three nor four
Draw a snake and add feet
Beat the grass to scare the snake
Lure the tiger away from the mountain
Chicken feathers and garlic skins
One gun and a horse
Can't tell beans from wheat
Doesn't know good from bad
Eyes bright like torches

Appendix S2: linear mixed effects model outputs referenced in main paper

In all models significance values are estimated by the R package lmerTest (version 2.0-11; Kuznetsova, Brockhoff & Christensen, 2014):

*** $p < .001$, ** $p < .01$, * $p < .05$, + $p < .10$. For likelihood of skipping a logistic linear mixed effects model was used and for fixation count a generalised linear model with poisson regression was used. For all duration measures linear mixed effects models were used and only non-skipped items were included.

Experiment 1

Table S1. Omnibus linear mixed effects models for word level data, corrected to assume a lower bound of 100ms for all skipped items.

	First fixation duration			First pass reading time			Total reading time		
Fixed effects:	β	SE	t	β	SE	t	β	SE	t
Intercept	5.53	0.03	160.76***	5.68	0.13	42.87***	5.68	0.11	50.38***
Group: English	-0.27	0.05	-5.81***	-0.37	0.06	-6.43***	-0.47	0.08	-5.98***
Language: English	0.01	0.04	0.12	-0.02	0.04	-0.46	-0.04	0.06	-0.61
Type: Control	0.10	0.04	2.84**	0.12	0.04	2.70**	0.15	0.06	2.64**
Group*Language	-0.22	0.05	-4.42***	-0.21	0.05	-3.90***	-0.33	0.07	-5.03***
Group*Type	-0.09	0.05	-1.77	-0.11	0.06	-1.80	-0.14	0.08	-1.87
Language*Type	-0.14	0.05	-2.82**	-0.11	0.06	-1.88	-0.10	0.07	-1.53
Group*Language*Type	0.28	0.07	4.12***	0.25	0.08	3.22**	0.37	0.09	4.00***
Control predictors:									
Word length (letters)	n/a	n/a	n/a	0.04	0.01	3.44**	0.06	0.07	3.12**
LogFrequency	n/a	n/a	n/a	-0.02	0.01	-2.43*	n/a	n/a	n/a

Table S2. Chinese native speakers, all items, word level data (skipped items removed from durational analysis)

	Likelihood of skipping			First fixation duration			First pass reading time			Total reading time			Total fixation count			
Fixed effects:	β	SE	z	β	SE	t	β	SE	t	β	SE	t	β	SE	z	
Intercept	3.47	1.51	2.30*	5.55	0.04	135.22***	5.78	0.16	36.74***	5.73	0.15	38.29***	0.54	0.08	6.53***	
Language: English	0.19	0.87	0.21	0.02	0.04	0.50	0.00	0.04	0.05	-0.02	0.07	-0.37	-0.07	0.08	-0.84	
Type: Control	-4.10	0.97	-2.08*	0.08	0.04	2.32*	0.09	0.05	2.03*	0.12	0.05	2.19*	0.08	0.07	1.16	
Language*Type	2.11	1.59	1.33	-0.13	0.05	-2.65**	-0.09	0.06	-1.66	-0.09	0.07	-1.39	-0.08	0.10	-0.76	
Control predictors:																
Word length (letters)	-1.69	0.37	-4.61***	n/a	n/a	n/a	0.05	0.01	3.20**	0.05	0.02	2.18*	n/a	n/a	n/a	
LogFrequency	n/a	n/a	n/a	n/a	n/a	n/a	-0.03	0.01	-3.01**	n/a	n/a	n/a	n/a	n/a	n/a	
Random effects																
	Variance			Variance			Variance			Variance			Variance			
Subject	0.669			0.020			0.035			0.069			0.012			
Item	0.000			0.000			0.000			0.021			0.066			
Subject Language	0.485			0.006			0.002			0.002			0.000			
Subject Type	3.489			0.001			0.010			0.014			0.000			
Residual	n/a			0.126			0.160			0.235			n/a			

Table S3. *English native speakers, all items, word level data (skipped items removed from durational analysis)*

	Likelihood of skipping			First fixation duration			First pass reading time			Total reading time			Total fixation count		
Fixed effects:	β	SE	z	β	SE	t	β	SE	t	β	SE	t	β	SE	z
Intercept	-0.65	0.69	-0.94	5.41	0.12	44.03***	5.40	0.03	183.68***	5.57	0.04	144.18***	0.29	0.06	5.00***
Language: English	1.63	0.36	4.53***	-0.08	0.03	-2.30*	-0.14	0.04	-3.37***	-0.27	0.05	-5.23***	-0.56	0.09	-6.10***
Type: Control	0.27	0.40	0.68	0.03	0.03	0.99	0.03	0.04	0.76	0.02	0.05	0.45	-0.02	0.08	-0.30
Language*Type	-2.22	0.49	-4.50***	-0.01	0.04	-0.36	-0.02	0.05	-0.46	0.10	0.06	1.69	0.44	0.12	3.66***
Control predictors:															
Word length (letters)	-0.43	0.13	-3.31***	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
LogFrequency	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Random effects															
	Variance			Variance			Variance			Variance			Variance		
Subject	0.011			0.002			0.004			0.007			0.004		
Item	0.144			0.002			0.004			0.007			0.000		
Subject Language	0.327			0.001			0.002			0.003			0.003		
Subject Type	0.333			0.004			0.004			0.015			0.006		
Residual	n/a			0.087			0.120			0.192			n/a		

Table S4. *Chinese native speakers, word and phrase level data, all items, interaction with familiarity*

	Likelihood of skipping			First fixation duration (word)			First pass reading time (word)			Total reading time (word)			Total reading time (phrase)			Regression duration (word)		
Fixed effects:	β	SE	z	β	SE	t	β	SE	t	β	SE	t	β	SE	t	β	SE	t
Intercept	3.16	2.13	1.48	5.54	0.10	53.34***	5.78	0.18	31.27***	5.91	0.16	37.36***	7.02	0.21	32.95***	0.68	0.22	28.71***
Language: English	-0.63	1.63	-0.39	0.02	0.11	0.22	0.07	0.12	0.59	0.13	0.16	0.79	-0.28	0.14	-1.94*	0.03	0.23	0.14
Type: Control	-0.02	0.00	-0.00	-0.11	0.14	-0.81	-0.09	0.16	-0.59	0.05	0.20	0.23	-0.06	0.15	-0.42	0.07	0.27	0.26
Familiarity	-0.01	0.23	-0.24	0.00	0.02	0.11	0.01	0.02	0.41	0.02	0.02	0.75	-0.01	0.02	-0.55	-0.00	0.03	-0.02
Language*Type	0.01	0.00	0.00	0.01	0.15	0.09	0.05	0.17	0.32	-0.06	0.21	-0.29	0.08	0.16	0.51	-0.11	0.29	-0.39
Language*Fam	0.12	0.26	0.45	0.00	0.02	0.01	-0.02	0.02	-0.73	-0.04	0.03	-1.65	-0.01	0.02	-0.51	-0.03	0.04	-0.89
Type*Fam	0.15	0.01	0.00	0.03	0.02	1.43	0.03	0.02	1.20	0.01	0.03	0.38	0.01	0.02	0.62	0.01	0.04	0.15
Language*Type*Fam	-0.15	0.01	-0.00	-0.02	0.03	-0.64	-0.02	0.03	-0.60	0.00	0.04	0.05	-0.01	0.03	-0.48	0.02	0.05	0.37
Control predictors																		
Word length (letters)	-1.48	0.37	-3.98***	n/a	n/a	n/a	0.04	0.02	2.88**	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
LogFrequency	n/a	n/a	n/a	n/a	n/a	n/a	-0.04	0.01	-3.24**	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Idiom length (words)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.09	0.03	3.08**	n/a	n/a	n/a
Random effects																		
	Variance			Variance			Variance			Variance			Variance			Variance		
Subject	0.221			0.020			0.020			0.070			0.091			0.129		
Item	0.000			0.001			0.070			0.022			0.039			0.045		
Subject Language	0.124			0.005			0.003			0.003			0.008			0.033		
Subject Type	7.859			0.001			0.014			0.014			0.003			0.013		
Residual	n/a			0.125			0.235			0.235			0.139			0.444		

Table S5. Chinese native speakers, word and phrase level data, all items, interaction with compositionality (English ratings)

	Likelihood of skipping			First fixation duration (word)			First pass reading time (word)			Total reading time (word)			Total reading time (phrase)			Regression duration (word)		
Fixed effects:	β	SE	z	β	SE	t	β	SE	t	β	SE	t	β	SE	t	β	SE	t
Intercept	2.78	1.92	1.44	5.62	0.08	74.53***	5.82	0.17	34.01***	6.07	0.14	43.71***	6.95	0.22	31.24***	6.40	0.19	33.76***
Language: English	1.24	2.63	0.47	0.04	0.15	0.30	-0.13	0.17	-0.81	-0.03	0.27	-0.10	-0.03	0.29	-0.10	0.08	0.37	0.22
Type: Control	-0.77	4.75	-0.16	0.08	0.10	0.80	0.09	0.11	0.78	0.10	0.14	0.72	0.08	0.10	0.82	0.08	0.18	0.45
Compositionality	0.18	0.32	0.58	-0.02	0.02	-0.99	-0.01	0.02	-0.71	-0.02	0.03	-0.53	0.00	0.03	0.03	-0.03	0.04	-0.75
Language*Type	-5.05	6.54	-0.77	-0.15	0.21	-0.73	0.10	0.23	0.41	0.21	0.28	0.75	0.36	0.22	1.64	0.38	0.39	1.01
Language*Comp	-0.27	0.59	-0.46	-0.00	0.04	-0.12	0.03	0.04	0.86	-0.01	0.07	-0.14	-0.06	0.07	-0.94	-0.04	0.09	-0.40
Type*Comp	-1.08	1.58	-0.69	0.00	0.02	0.07	0.00	0.03	0.06	0.01	0.03	0.18	-0.02	0.03	-0.60	0.01	0.05	0.16
Language*Type*Comp	1.94	1.90	1.02	0.01	0.05	0.10	-0.05	0.06	-0.82	-0.07	0.07	-1.10	-0.09	0.05	-1.66	-0.11	0.09	-1.21
Control predictors																		
Word length (letters)	-1.69	0.37	-4.58***	n/a	n/a	n/a	0.05	0.02	3.17**	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
LogFrequency	n/a	n/a	n/a	n/a	n/a	n/a	-0.03	0.01	-2.88**	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Idiom length (words)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.09	0.03	3.11**	n/a	n/a	n/a
Random effects																		
Subject	Variance			Variance			Variance			Variance			Variance			Variance		
Item	0.669			0.021			0.035			0.069			0.087			0.128		
Subject Language	0.000			0.000			0.000			0.024			0.038			0.044		
Subject Type	0.468			0.001			0.002			0.003			0.002			0.035		
Residual	3.776			0.000			0.010			0.013			0.007			0.014		
	n/a			0.127			0.160			0.235			0.139			0.443		

Table S6. Chinese native speakers, word and phrase level data, all items, interaction with compositionality (Chinese ratings)

	Likelihood of skipping			First fixation duration (word)			First pass reading time (word)			Total reading time (word)			Total reading time (phrase)			Regression duration (word)		
Fixed effects:	β	SE	z	β	SE	t	β	SE	t	β	SE	t	β	SE	t	β	SE	t
Intercept	4.02	3.20	1.25	5.55	0.15	38.21***	5.64	0.25	22.75***	5.83	0.27	21.02***	7.22	0.29	24.83***	6.43	0.37	17.47***
Type: Control	-4.81	7.32	-0.66	-0.05	0.19	-0.27	0.07	0.23	0.29	0.46	0.27	1.70	0.14	0.19	0.76	0.24	0.38	0.62
Compositionality	-0.30	0.43	-0.70	0.00	0.02	0.04	0.01	0.03	0.49	0.03	0.05	0.67	-0.04	0.04	-1.02	-0.03	0.06	-0.44
Type*Comp	0.02	0.88	0.02	0.02	0.03	0.72	0.01	0.04	0.13	-0.06	0.05	-1.28	-0.02	0.03	-0.61	-0.02	0.07	-0.34
Control predictors																		
Word length (letters)	-1.83	0.73	-2.51	n/a	n/a	n/a	0.05	0.02	2.73**	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
LogFrequency	n/a	n/a	n/a	n/a	n/a	n/a	-0.03	0.02	-1.93*	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Idiom length (words)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.09	0.03	2.60*	n/a	n/a	n/a
Random effects																		
Subject	Variance			Variance			Variance			Variance			Variance			Variance		
Subject	5.914			0.021			0.039			0.090			0.104			0.153		
Item	0.000			0.000			0.000			0.026			0.026			0.042		
Subject Type	56.76			0.000			0.018			0.045			0.011			0.061		
Residual	n/a			0.121			0.167			0.225			0.113			0.446		

Table S7. Chinese native speakers, word and phrase level data, all items, interaction with plausibility

	Likelihood of skipping			First fixation duration (word)			First pass reading time (word)			Total reading time (word)			Total reading time (phrase)			Regression duration (word)		
Fixed effects:	β	SE	z	β	SE	t	β	SE	t	β	SE	t	β	SE	t	β	SE	t
Intercept	2.90	2.05	1.42	5.69	0.09	64.48***	5.89	0.19	31.75***	6.12	0.15	41.21***	7.11	0.22	32.16***	6.29	0.20	30.68***
Language: English	1.18	2.66	0.44	-0.05	0.19	-0.25	0.25	0.21	1.17	-0.26	0.31	-0.83	-0.36	0.25	-1.45	-0.40	0.43	-0.92
Type: Control	-15.8	26.8	-0.59	-0.21	0.14	-1.49	-0.18	0.16	-1.18	-0.07	0.21	-0.35	0.13	0.16	0.79	0.21	0.29	0.73
Plausibility	0.11	0.29	0.37	-0.04	0.02	-1.75	-0.01	0.02	-0.48	-0.03	0.04	-0.84	-0.03	0.03	-0.99	-0.00	0.05	-0.06
Language*Type	11.9	26.9	0.44	0.12	0.24	0.52	-0.01	0.26	-0.02	0.29	0.35	0.83	-0.08	0.26	-0.31	0.23	0.48	0.47
Language*Plaus	-0.22	0.46	-0.47	0.03	0.04	0.80	-0.03	0.04	-0.88	0.05	0.06	0.76	0.02	0.04	0.49	0.05	0.08	0.66
Type*Plaus	2.88	6.21	0.46	0.08	0.04	2.15*	0.08	0.04	1.86	0.06	0.06	0.94	-0.03	0.05	-0.69	-0.03	0.08	-0.37
Language*Type*Plaus	-2.51	6.23	-0.40	-0.08	0.05	-1.61	-0.06	0.06	-1.09	-0.10	0.08	-1.26	0.02	0.06	0.36	-0.04	0.11	-0.39
Control predictors																		
Word length (letters)	-1.62	0.38	-4.22***	n/a	n/a	n/a	0.04	0.02	2.77**	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
LogFrequency	n/a	n/a	n/a	n/a	n/a	n/a	-0.04	0.01	-3.33***	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Idiom length (words)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.08	0.03	2.69**	n/a	n/a	n/a
Random effects																		
				Variance			Variance			Variance			Variance			Variance		
Subject	0.360			0.020			0.035			0.069			0.088			0.128		
Item	0.000			0.001			0.000			0.024			0.040			0.048		
Subject Language	0.117			0.005			0.002			0.002			0.007			0.034		
Subject Type	4.022			0.001			0.010			0.014			0.002			0.015		
Residual	n/a			0.126			0.159			0.235			0.140			0.443		

Table S8. *English native speakers, word and phrase level data, all items, interaction with familiarity*

	Likelihood of skipping			First fixation duration (word)			First pass reading time (word)			Total reading time (word)			Total reading time (phrase)			Regression duration (word)		
Fixed effects:	β	SE	z	β	SE	t	β	SE	t	β	SE	t	β	SE	t	β	SE	t
Intercept	-1.61	0.89	-1.82	5.37	0.07	75.47***	5.41	0.05	119.70***	5.60	0.06	97.16***	6.57	0.17	38.30***	6.06	0.11	55.81***
Language: English	0.64	1.24	0.52	-0.08	0.11	-0.67	-0.14	0.13	-1.08	-0.36	0.17	-2.14*	-0.62	0.17	-3.77***	-0.40	0.24	-1.62
Type: Control	1.13	0.69	1.65	0.03	0.05	0.51	-0.01	0.06	-0.13	0.01	0.08	0.17	-0.03	0.07	-0.50	-0.09	0.10	-0.86
Familiarity	0.29	0.16	1.87 ⁺	-0.00	0.01	-0.34	-0.00	0.02	-0.19	-0.01	0.02	-0.68	-0.03	0.02	-1.33	-0.03	0.03	-0.90
Language*Type	-0.39	1.61	-0.24	0.10	0.15	0.68	0.10	0.17	0.59	-0.04	0.22	-0.17	0.08	0.19	0.42	-0.18	0.31	-0.58
Language*Fam	-0.02	0.23	-0.07	0.00	0.02	0.13	0.00	0.03	0.14	0.02	0.03	0.74	0.00	0.03	0.06	-0.00	0.05	-0.03
Type*Fam	-0.32	0.20	-1.58	0.00	0.02	0.17	0.02	0.02	0.76	0.01	0.03	0.19	0.02	0.02	0.96	0.03	0.04	0.85
Language*Type*Fam	-0.10	0.30	-0.35	-0.02	0.03	-0.72	-0.03	0.03	-0.92	0.02	0.04	0.45	0.01	0.04	0.20	0.04	0.06	0.67
Control predictors																		
Word length (letters)	-0.40	0.13	-3.07**	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
LogFrequency	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Idiom length (words)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.09	0.03	3.26**	n/a	n/a	n/a
Random effects																		
	Variance			Variance			Variance			Variance			Variance			Variance		
Subject	0.145			0.002			0.004			0.007			0.088			0.105		
Item	0.131			0.002			0.004			0.007			0.029			0.018		
Subject Language	0.472			0.001			0.002			0.003			0.006			0.031		
Subject Type	0.438			0.004			0.005			0.016			0.013			0.014		
Residual	n/a			0.087			0.121			0.192			0.156			0.392		

Table S9. *English native speakers, word and phrase level data, all items, interaction with compositionality (English ratings)*

	Likelihood of skipping			First fixation duration (word)			First pass reading time (word)			Total reading time (word)			Total reading time (phrase)			Regression duration (word)		
Fixed effects:	β	SE	z	β	SE	t	β	SE	t	β	SE	t	β	SE	t	β	SE	t
Intercept	-1.02	1.00	-1.02	5.34	0.06	89.41***	5.39	0.07	72.98***	5.43	0.09	57.62***	6.47	0.21	31.10***	5.88	0.16	37.86***
Language: English	1.81	1.19	1.52	-0.11	0.14	-0.78	-0.19	0.17	-1.12	-0.31	0.22	-1.42	-0.76	0.27	-2.84**	-0.68	0.32	-2.13*
Type: Control	0.29	1.02	0.28	0.01	0.08	0.18	0.03	0.09	0.37	0.19	0.12	1.58	-0.01	0.10	-0.07	0.26	0.17	1.55
Compositionality	0.11	0.19	0.57	-0.02	0.01	-0.74	0.00	0.02	0.20	0.04	0.02	1.59	0.01	0.03	0.18	0.03	0.03	0.96
Language*Type	-0.78	1.77	-0.44	-0.13	0.18	-0.77	-0.04	0.21	-0.17	0.35	0.26	1.33	0.16	0.21	2.13	0.27	0.37	0.72
Language*Comp	-0.05	0.28	-0.19	0.01	0.03	0.31	0.01	0.04	0.32	0.01	0.05	0.12	0.01	0.06	0.16	0.04	0.08	0.48
Type*Comp	-0.00	0.24	-0.02	0.00	0.02	0.23	-0.00	0.02	-0.08	-0.04	0.03	-1.52	0.01	0.02	0.23	-0.07	0.04	-1.81
Language*Type*Comp	-0.35	0.42	-0.83	0.03	0.04	0.68	0.00	0.05	0.07	-0.06	0.06	-0.89	-0.06	0.05	-1.13	-0.01	0.09	-0.08
Control predictors																		
Word length (letters)	-0.44	0.13	-3.34***	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
LogFrequency	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Idiom length (words)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.09	0.03	3.33**	n/a	n/a	n/a
Random effects																		
	Variance			Variance			Variance			Variance			Variance			Variance		
Subject	0.010			0.002			0.004			0.006			0.088			0.103		
Item	0.132			0.002			0.004			0.007			0.031			0.019		
Subject Language	0.323			0.000			0.002			0.003			0.006			0.031		
Subject Type	0.334			0.004			0.004			0.016			0.014			0.013		
Residual	n/a			0.087			0.121			0.191			0.156			0.390		

Table S10. *English native speakers, word and phrase level data, all items, interaction with plausibility*

	Likelihood of skipping			First fixation duration (word)			First pass reading time (word)			Total reading time (word)			Total reading time (phrase)			Regression duration (word)		
Fixed effects:	β	SE	z	β	SE	t	β	SE	t	β	SE	t	β	SE	t	β	SE	t
Intercept	-2.04	1.15	-1.77	5.52	0.09	67.77***	5.53	0.08	66.07***	5.70	0.11	52.71***	6.67	0.18	36.66***	6.15	0.17	35.24***
Language: English	0.75	1.55	0.48	-0.32	0.16	-1.96*	-0.45	0.20	-2.27*	-0.52	0.25	-2.06*	-0.95	0.14	-6.99***	-0.66	0.38	-1.76
Type: Control	0.69	1.44	0.48	0.00	0.11	0.02	-0.01	0.14	-0.11	-0.19	0.18	-1.08	-0.24	0.11	-2.11*	0.13	0.26	0.50
Plausibility	0.36	0.22	1.63	-0.04	0.02	-2.22*	-0.04	0.02	-1.67	-0.04	0.03	-1.30	-0.04	0.02	-2.11*	-0.04	0.04	-1.00
Language*Type	0.30	2.03	0.15	0.22	0.19	1.12	0.30	0.23	1.28	0.64	0.30	2.15*	0.48	0.16	2.93**	0.16	0.43	0.36
Language*Plaus	-0.01	0.29	-0.03	0.06	0.03	1.89*	0.07	0.04	1.85	0.06	0.05	1.24	0.05	0.03	2.04*	0.04	0.07	0.61
Type*Plaus	-0.08	0.38	-0.22	0.01	0.03	0.21	0.01	0.04	0.28	0.07	0.05	1.25	0.06	0.03	2.40*	-0.05	0.07	-0.63
Language*Type*Plaus	-0.44	0.46	-0.96	-0.05	0.04	-1.16	-0.06	0.05	-1.25	-0.13	0.06	-2.03*	-0.06	0.04	-1.71	0.02	0.09	0.24
Control predictors																		
Word length (letters)	-0.42	0.13	-3.26**	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
LogFrequency	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Idiom length (words)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.09	0.03	3.29**	n/a	n/a	n/a
Random effects																		
				Variance			Variance			Variance			Variance			Variance		
Subject	0.011			0.002			0.003			0.007			0.089			0.105		
Item	0.115			0.001			0.004			0.007			0.029			0.021		
Subject Language	0.341			0.000			0.001			0.016			0.005			0.014		
Subject Type	0.327			0.005			0.005			0.003			0.014			0.032		
Residual	n/a			0.087			0.120			0.191			0.155			0.390		

Experiment 2

Table S11. *Chinese native speakers, all items*

	First pass reading time			Total reading time			Total fixation count			Regression path duration		
Fixed effects:	β	SE	t	β	SE	t	β	SE	z	β	SE	t
Intercept	6.58	0.19	34.60***	6.92	0.20	33.93***	1.46	0.21	7.03***	5.98	0.21	28.22***
Language: English	-0.35	0.09	-4.00***	-0.40	0.09	-4.62***	-0.37	0.09	-4.08***	-0.47	0.09	-5.17***
Type: Literal	-0.14	0.06	-2.30*	-0.12	0.04	-2.72**	-0.10	0.04	-2.52*	-0.13	0.04	2.91**
Language*Type	0.00	0.08	0.05	-0.02	0.06	-0.27	-0.01	0.06	-0.21	0.02	0.06	0.29
Control predictors:												
Idiom length (words)	0.09	0.03	2.62**	0.11	0.04	3.06**	0.11	0.04	2.92**	0.19	0.04	4.93***
Random effects												
	Variance			Variance			Variance			Variance		
Subject	0.034			0.076			0.058			0.052		
Item	0.032			0.046			0.049			0.052		
Subject Language	0.002			0.007			0.007			0.003		
Subject Type	0.001			0.004			0.000			0.004		
Residual	0.319			0.146			n/a			0.155		

Table S12. *English native speakers, all items*

	First pass reading time			Total reading time			Total fixation count			Regression path duration		
Fixed effects:	β	SE	t	β	SE	t	β	SE	z	β	SE	t
Intercept	6.10	0.15	41.61***	6.43	0.18	36.03***	1.16	0.17	7.01***	5.39	0.18	29.24***
Language: English	-0.51	0.07	-7.40***	-0.76	0.08	-9.89***	-0.64	0.08	-8.20***	-0.52	0.08	-6.22***
Type: Literal	-0.11	0.06	-1.94*	-0.16	0.04	-3.66***	-0.14	0.05	-3.04**	-0.08	0.05	-1.73
Language*Type	0.12	0.08	1.59	0.18	0.06	3.07**	0.16	0.08	2.09*	0.09	0.07	1.34
Control predictors:												
Idiom length (words)	0.06	0.03	2.42*	0.10	0.03	3.09**	0.10	0.03	3.33***	0.18	0.03	5.52***
Random effects	Variance			Variance			Variance			Variance		
Subject	0.026			0.064			0.041			0.095		
Item	0.012			0.031			0.022			0.030		
Subject Language	0.000			0.003			0.003			0.022		
Subject Type	0.005			0.001			0.000			0.000		
Residual	0.306			0.172			n/a			0.207		

Table S13. *Chinese native speakers, all items, interaction with familiarity*

	First pass reading time			Total reading time			Total fixation count			Regression path duration		
Fixed effects:	β	SE	t	β	SE	t	β	SE	z	β	SE	t
Intercept	6.35	0.27	23.88***	6.90	0.24	28.82***	1.50	0.24	6.37***	6.06	0.25	23.78***
Language: English	0.04	0.23	0.17	-0.20	0.18	-1.12	-0.26	0.18	-1.43	-0.51	0.19	-2.73**
Type: Literal	0.16	0.28	0.57	-0.13	0.19	-0.67	-0.16	0.19	-0.84	-0.21	0.20	-1.07
Familiarity	0.03	0.03	0.98	-0.00	0.02	-0.14	-0.01	0.02	-0.65	-0.01	0.02	-0.59
Language*Type	-0.39	0.30	-1.29	-0.0	0.21	-0.97	-0.05	0.21	-0.22	0.02	0.22	0.10
Language*Fam	-0.07	0.04	-1.94*	-0.04	0.03	-1.62	-0.03	0.03	-1.13	0.00	0.03	0.13
Type*Fam	-0.05	0.04	-1.09	0.00	0.03	0.05	0.01	0.03	0.32	0.01	0.03	0.42
Language*Fam*Type	0.07	0.05	1.40	0.04	0.03	1.24	0.01	0.03	0.38	0.00	0.03	0.11
Control predictors:												
Idiom length (words)	0.10	0.03	2.87**	-0.20	0.03	3.43***	0.12	0.04	3.37**	0.19	0.04	5.00***
Random effects												
	Variance			Variance			Variance			Variance		
Subject	0.035			0.076			0.058			0.053		
Item	0.028			0.041			0.042			0.051		
Subject Language	0.002			0.008			0.009			0.005		
Subject Type	0.001			0.004			0.000			0.004		
Residual	0.319			0.145			n/a			0.156		

Table S14. *Chinese native speakers, all items, interaction with compositionality (English ratings)*

	First pass reading time			Total reading time			Total fixation count			Regression path duration		
Fixed effects:	β	SE	t	β	SE	t	β	SE	z	β	SE	t
Intercept	6.49	0.25	25.97***	6.95	0.26	27.19***	1.50	0.25	5.92***	5.83	0.26	22.04***
Language: English	-0.33	0.10	-0.83	-0.62	0.38	-1.62	-0.40	0.39	-1.04	-0.23	0.40	-0.59
Type: Literal	-0.03	0.16	-0.17	-0.48	0.11	-4.43***	-0.43	0.11	-4.04***	-0.27	0.11	-2.39*
Compositionality	0.03	0.04	0.70	-0.03	0.03	-0.76	-0.02	0.03	-0.58	0.03	0.04	0.81
Language*Type	-0.39	0.42	-0.91	0.63	0.29	2.14*	0.48	0.34	1.43	0.26	0.30	0.84
Language*Comp	-0.01	0.09	-0.06	0.06	0.09	0.65	0.02	0.09	0.17	-0.06	0.09	-0.60
Type*Comp	-0.03	0.04	-0.77	0.10	0.03	3.63***	0.09	0.03	3.34***	0.04	0.03	1.34
Language*Comp*Type	0.10	0.10	0.95	-0.17	0.07	-2.40*	-0.13	0.08	-1.61	-0.06	0.07	-0.86
Control predictors:												
Idiom length (words)	0.09	0.04	2.50*	0.11	0.04	3.06**	0.11	0.04	3.05**	0.20	0.04	5.07***
Random effects												
	Variance			Variance			Variance			Variance		
Subject	0.034			0.075			0.056			0.052		
Item	0.034			0.048			0.047			0.052		
Subject Language	0.002			0.008			0.008			0.003		
Subject Type	0.001			0.004			0.000			0.004		
Residual	0.319			0.144			n/a			0.155		

Table S15. *Chinese native speakers, Chinese items only, interaction with compositionality (Chinese ratings)*

	First pass reading time			Total reading time			Total fixation count			Regression path duration		
Fixed effects:	β	SE	t	β	SE	t	β	SE	z	β	SE	t
Intercept	6.70	0.45	14.86***	7.45	0.45	16.65***	2.08	0.43	4.75***	5.99	0.50	12.05***
Type: Literal	-0.07	0.49	-0.14	-0.76	0.29	-2.63**	-0.84	0.30	-2.77**	0.07	0.29	0.26
Compositionality	-0.06	0.07	-0.73	-0.12	0.07	-1.66	-0.12	0.07	-1.74	-0.01	0.08	-0.07
Type*Comp	-0.01	0.08	-0.15	0.11	0.05	2.24*	0.13	0.05	2.47*	-0.04	0.05	-0.73
Control predictors:												
Idiom length (words)	0.13	0.05	2.82*	0.14	0.05	2.78**	0.13	0.05	2.56*	0.20	0.06	3.47***
Random effects	Variance			Variance			Variance			Variance		
Subject	0.024			0.078			0.055			0.054		
Item	0.021			0.046			0.044			0.061		
Subject Type	0.004			0.001			0.000			0.000		
Residual	0.397			0.127			n/a			0.125		

Table S16. *Chinese native speakers, all items, interaction with literal plausibility*

	First pass reading time			Total reading time			Total fixation count			Regression path duration		
Fixed effects:	β	SE	t	β	SE	t	β	SE	z	β	SE	t
Intercept	6.77	0.39	17.35***	7.53	0.37	20.23***	2.08	0.36	5.73***	6.77	0.37	18.31***
Language: English	-0.35	0.49	-0.72	-0.70	0.46	-1.51	-0.47	0.46	-1.03	-0.85	0.46	-1.85
Type: Literal	-0.40	0.33	-1.19	-0.38	0.23	-1.66	-0.31	0.23	-1.37	-0.42	0.23	-1.80
Literal plausibility	-0.04	0.06	-0.64	-0.12	0.06	-2.08*	-0.13	0.06	-2.17*	-0.16	0.06	-2.72**
Language*Type	0.50	0.48	1.03	0.52	0.33	1.57	0.36	0.35	1.02	0.81	0.34	2.40*
Language*LitPlaus	0.01	0.09	0.06	0.07	0.08	0.78	0.03	0.08	0.39	0.08	0.08	1.01
Type*LitPlaus	0.05	0.07	0.79	0.05	0.04	1.16	0.04	0.5	0.94	0.06	0.05	1.27
Language*LitPlaus*Type	-0.09	0.09	-1.04	-0.10	0.06	-1.64	-0.07	0.07	-1.08	-0.15	0.06	-2.35*
Control predictors:												
Idiom length (words)	0.10	0.04	2.71**	0.12	0.04	3.29***	0.12	0.03	3.33***	0.20	0.04	5.61***
Random effects												
	Variance			Variance			Variance			Variance		
Subject	0.033			0.076			0.057			0.052		
Item	0.032			0.041			0.039			0.040		
Subject Language	0.002			0.007			0.007			0.003		
Subject Type	0.001			0.004			0.000			0.004		
Residual	0.320			0.146			n/a			0.155		

Table S17. *English native speakers, all items, interaction with familiarity*

	First pass reading time			Total reading time			Total fixation count			Regression path duration		
Fixed effects:	β	SE	t	β	SE	t	β	SE	z	β	SE	t
Intercept	6.14	0.16	37.61***	6.52	0.19	34.86***	1.23	0.18	6.94***	5.40	0.20	27.49***
Language: English	-0.63	0.24	-2.67**	-0.60	0.20	-3.03**	-0.53	0.26	-2.09*	-0.52	0.21	-2.45*
Type: Literal	-0.16	0.10	-1.61	-0.19	0.07	-2.62**	-0.20	0.8	-2.60**	-0.10	0.08	-1.22
Familiarity	-0.01	0.02	-0.61	-0.03	0.02	-1.52	-0.02	0.02	-1.16	-0.00	0.02	-0.11
Language*Type	0.55	0.36	1.55	0.08	0.27	0.30	0.17	0.37	0.45	0.04	0.29	0.12
Language*Fam	0.03	0.04	0.65	-0.01	0.03	-0.23	-0.00	0.04	-0.02	0.00	0.04	0.03
Type*Fam	0.02	0.03	0.54	0.01	0.03	0.57	0.03	0.03	0.98	0.01	0.03	0.28
Language*Fam*Type	-0.08	0.06	-1.26	0.01	0.05	0.14	-0.02	0.06	-0.31	0.00	0.05	0.06
Control predictors:												
Idiom length (words)	0.06	0.03	2.37*	0.09	0.03	2.98**	0.10	0.03	3.24**	0.18	0.03	5.48***
Random effects												
	Variance			Variance			Variance			Variance		
Subject	0.026			0.063			0.041			0.095		
Item	0.012			0.031			0.021			0.031		
Subject Language	0.000			0.003			0.003			0.023		
Subject Type	0.005			0.001			0.000			0.000		
Residual	0.307			0.172			n/a			0.208		

Table S18. *English native speakers, all items, interaction with compositionality (English ratings)*

	First pass reading time			Total reading time			Total fixation count			Regression path duration		
Fixed effects:	β	SE	t	β	SE	t	β	SE	z	β	SE	t
Intercept	6.27	0.19	33.78***	6.44	0.23	28.31***	1.16	0.20	5.68***	5.34	0.23	23.14***
Language: English	-1.03	0.32	-3.26**	-0.81	0.36	-2.24*	-0.78	0.38	-2.04*	-0.44	0.36	-1.20
Type: Literal	-0.38	0.15	-2.56*	-0.35	0.11	-3.11**	-0.30	0.12	-2.50*	-0.33	0.12	-2.68**
Compositionality	-0.03	0.03	-1.22	-0.01	0.03	-0.17	-0.00	0.03	-0.12	0.01	0.03	0.20
Language*Type	0.31	0.39	0.80	0.20	0.29	0.67	0.34	0.42	0.81	0.18	0.32	0.55
Language*Comp	0.13	0.07	1.70	0.01	0.08	0.14	0.03	0.09	0.38	-0.02	0.08	-0.23
Type*Comp	0.07	0.04	1.97 ⁺	0.05	0.03	1.85	0.04	0.03	1.43	0.07	0.03	2.18*
Language*Comp*Type	-0.05	0.09	-0.56	-0.01	0.07	-0.13	-0.05	0.10	-0.48	-0.03	0.08	-0.36
Control predictors:												
Idiom length (words)	0.06	0.03	2.24*	0.10	0.03	3.01**	0.10	0.03	3.35***	0.18	0.03	5.57***
Random effects												
	Variance			Variance			Variance			Variance		
Subject	0.026			0.065			0.034			0.096		
Item	0.009			0.033			0.021			0.030		
Subject Language	0.000			0.003			n/a ⁺⁺			0.023		
Subject Type	0.005			0.001			n/a ⁺⁺			0.000		
Residual	0.306			0.171			n/a			0.206		

⁺⁺Model including random slopes for language and type failed to converge, therefore random intercepts only were included.

Table S19. *English native speakers, all items, interaction with literal plausibility*

	First pass reading time			Total reading time			Total fixation count			Regression path duration		
Fixed effects:	β	SE	t	β	SE	t	β	SE	z	β	SE	t
Intercept	6.80	0.30	22.55***	7.09	0.30	23.76***	1.67	0.27	6.05***	6.04	0.33	18.12***
Language: English	-1.41	0.39	-3.58***	-1.32	0.38	-3.52***	-1.03	0.40	-2.57**	-0.78	0.42	-1.85
Type: Literal	-0.50	0.32	-1.52	0.09	0.24	0.37	0.09	0.26	0.33	-0.54	0.26	-2.06*
Literal plausibility	-0.14	0.05	-2.64**	-0.13	0.05	-2.71**	-0.10	0.05	-2.31*	-0.14	0.05	-2.50*
Language*Type	0.98	0.47	2.07*	0.69	0.35	1.95*	0.72	0.46	1.56	0.89	0.39	2.29*
Language*LitPlaus	0.17	0.07	2.40*	0.11	0.07	1.66	0.08	0.07	1.13	0.06	0.08	0.78
Type*LitPlaus	0.08	0.06	1.20	-0.05	0.05	-1.03	-0.05	0.05	-0.87	0.09	0.05	1.78
Language*LitPlaus*Type	-0.16	0.09	-1.83	-0.09	0.07	-1.32	-0.10	0.08	-1.12	-0.15	0.07	-2.12*
Control predictors:												
Idiom length (words)	0.06	0.03	2.37*	0.10	0.03	3.74	0.10	0.03	4.09***	0.19	0.03	6.16***
Random effects												
	Variance			Variance			Variance			Variance		
Subject	0.026			0.064			0.040			0.095		
Item	0.009			0.019			0.011			0.024		
Subject Language	0.000			0.003			0.003			0.023		
Subject Type	0.005			0.001			0.000			0.000		
Residual	0.306			0.170			n/a			0.206		