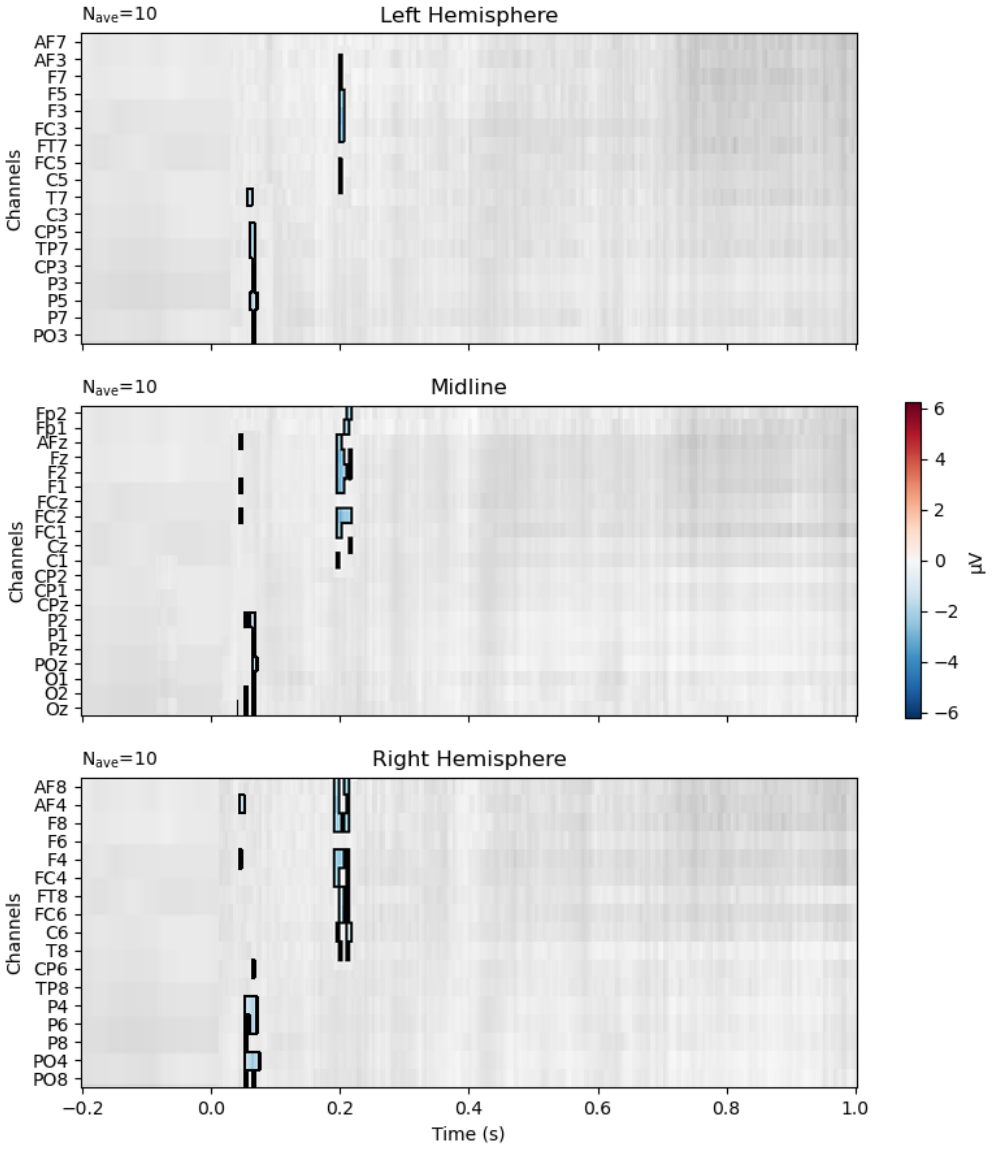
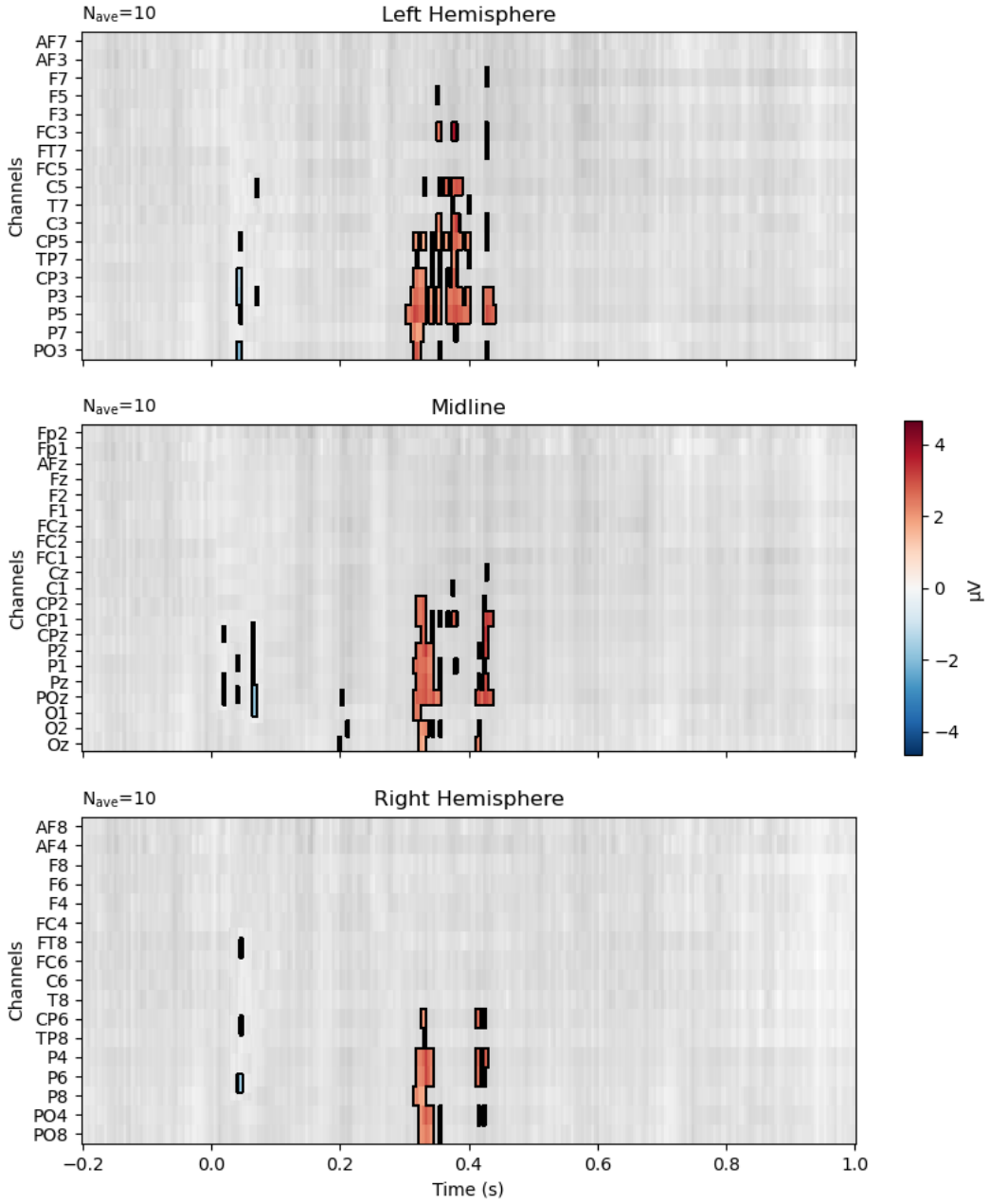
Supplementary Figure 1

Mass-univariate analyses (TFCE correction) reflecting electrodes and time points showing significant clusters for the effect of lexicality (words vs. pseudowords) in the L1 script condition



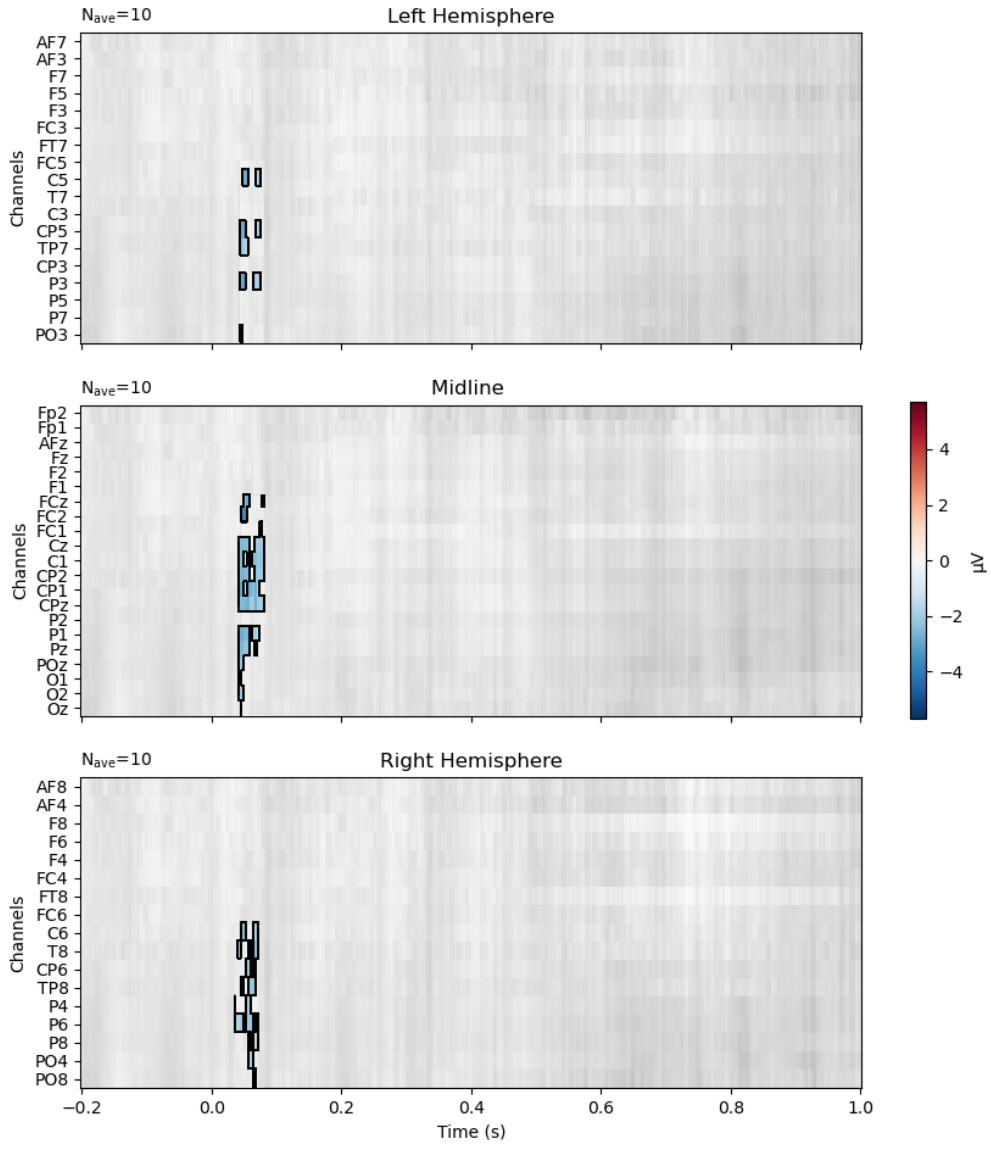
Supplementary Figure 2

Mass-univariate analyses (TFCE correction) reflecting electrodes and time points showing significant clusters for the effect of lexicality (words vs. pseudowords) in the L2 script condition



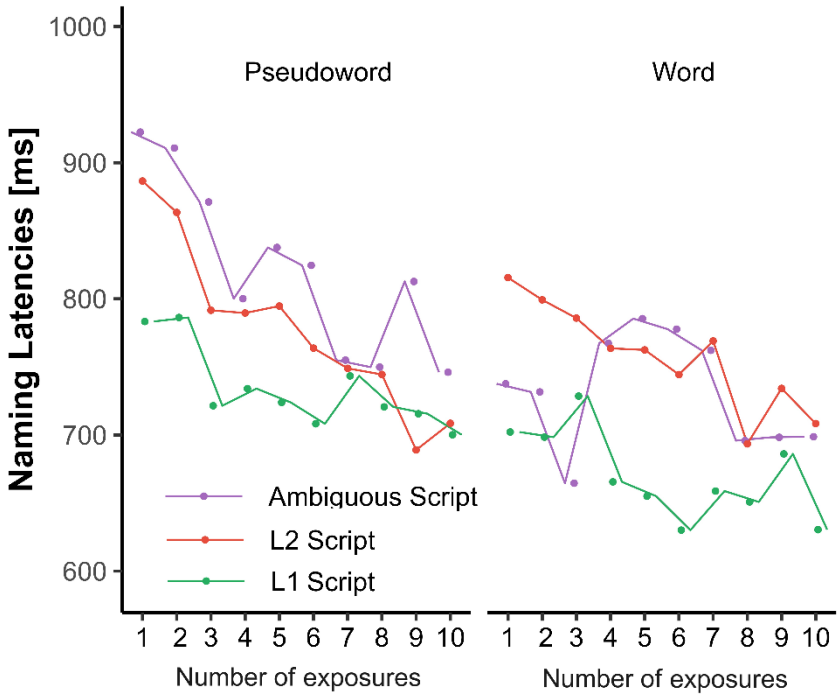
Supplementary Figure 3

Mass-univariate analyses (TFCE correction) reflecting electrodes and time points showing significant clusters for the effect of lexicality (words vs. pseudowords) in the Ambiguous script condition



Supplementary Figure 4

Mean reaction times obtained for words and pseudowords across the three script conditions (L1, L2 and ambiguous) during the reading-aloud task

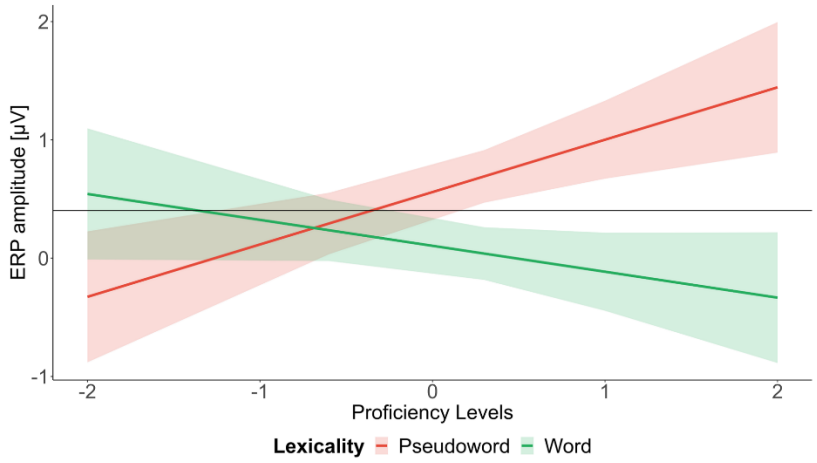


Supplementary Figure 5

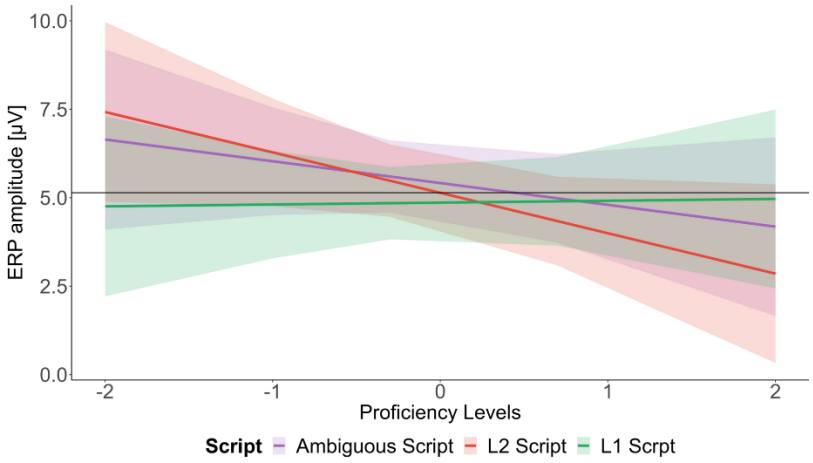
Modulation of ERP amplitudes at different latencies as a function of L2 proficiency

Note. Upper panel. Modulation of ERP amplitudes for words and pseudowords averaged over the 30 – 70 ms time window at the centroposterior region as a function of L2 proficiency level obtained in the Cambridge test. Middle panel. Modulation of ERP amplitudes for stimuli presented in L1, L2 and ambiguous scripts averaged over the 190 – 215 ms time window at the frontocentral region as a function of L2 proficiency level obtained in the L2 picture naming task. Lower panel. Modulation of ERP amplitudes for words and pseudowords presented in L1, L2 and ambiguous scripts averaged over the 350 – 450 ms time window at the centroposterior region as a function of L2 proficiency level obtained in the L2 picture naming task. Across all panels, solid lines represent the models' estimates for different conditions and shaded areas indicate the standard errors.

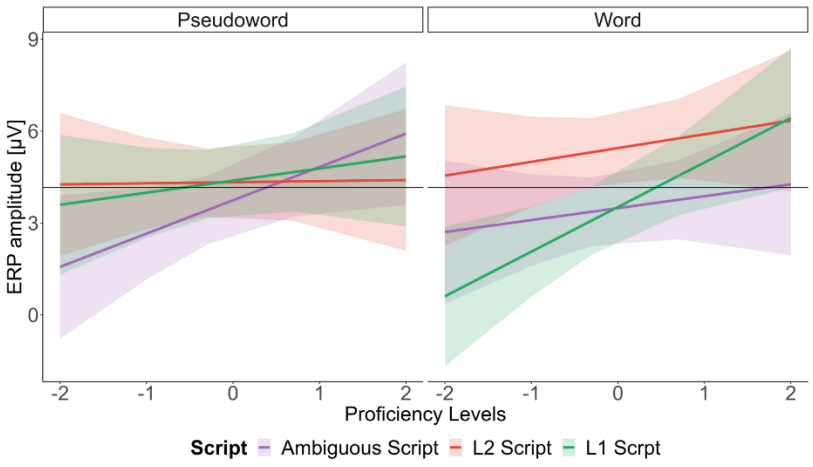
Lexicality x L2 proficiency : 30 – 70 ms



Script x L2 proficiency : 190 – 215 ms



Script x Lexicality x L2 proficiency : 30 – 70 ms



Supplementary Table 1

Summary of model produced by the call lmer(formula = LogRT ~ Lexicality + Script + Proficiency_ACC_std + Proficiency_CAM_std + Lexicality:Script + Lexicality:Proficiency_ACC_std + Script:Proficiency_ACC_std + Lexicality:Script:Proficiency_ACC_std + Lexicality:Proficiency_CAM_std + Script:Proficiency_CAM_std + Lexicality:Script:Proficiency_CAM_std + Exposure + (1 | Participants) + (1 | Participants:Lexicality) + (1 | Participants:Script) + (1 | Participants:Lexicality:Script) + (1 | Item), data = Training_Raw_out, REML = FALSE, control = lmerControl(optimizer = "bobyqa"))
Linear mixed model fit by maximum likelihood. t-tests use Kenward-Roger 's method

AIC	BIC	logLik	deviance	df.resid
-1354	-1142	710	-1420	4644

Scaled residuals:

Min	1Q	Median	3Q	Max
-3.36	-0.64	-0.07	0.53	3.77

Random effects:

Groups	Term	Std.Dev.
Participants:Lexicality:Script	(Intercept)	0.056038
Participants:Script	(Intercept)	0.046600
Participants:Lexicality	(Intercept)	0.024262
Item	(Intercept)	0.071640
Participants	(Intercept)	0.069377
Residual		0.201001

Number of obs: 4677, groups: Participants : Lexicality : Script, 120; Participants : Script, 60; Participants : Lexicality, 40; Item, 24; Participants, 20.

Fixed effects:

(Intercept)	-0.34	0.023	-15	***
Pseudoword vs. Word	0.074	0.032	2.3	*
L1 vs. Ambiguous word	-0.086	0.041	-2.1	*
L1 vs. L2 word	0.085	0.041	2.1	*
Proficiency: Picture naming	-0.0044	0.022	-0.2	
Proficiency: Cambridge	-0.059	0.022	-2.7	*
Exposure1	0.089	0.0088	10	***
Exposure2	0.067	0.0088	7.6	***
Exposure3	0.024	0.0088	2.7	**
Exposure4	0.0069	0.0088	0.79	
Exposure5	0.012	0.0088	1.4	
Exposure6	-0.0089	0.0089	-1	
Exposure7	-0.0077	0.0088	-0.87	
Exposure8	-0.05	0.0088	-5.6	***
Exposure9	-0.055	0.0088	-6.2	***
Pseudoword vs. Word : L1 vs. Ambiguous word	-0.027	0.077	-0.34	
Pseudoword vs. Word : L1 vs. L2 word	-0.064	0.077	-0.83	
Pseudoword vs. Word : Proficiency: Picture naming	-0.0022	0.017	-0.13	
L1 vs. Ambiguous word : Proficiency: Picture naming	-0.0093	0.025	-0.37	
L1 vs. L2 word : Proficiency: Picture naming	-0.016	0.025	-0.65	
Pseudoword vs. Word : Proficiency: Cambridge	0.00058	0.017	0.034	
L1 vs. Ambiguous word : Proficiency: Cambridge	-0.0052	0.025	-0.21	

L1 vs. L2 word : Proficiency: Cambridge	-0.012	0.025	-0.49
Pseudoword vs. Word : L1 vs. Ambiguous word : Proficiency: Picture naming	0.029	0.035	0.83
Pseudoword vs. Word : L1 vs. L2 word : Proficiency: Picture naming	0.022	0.035	0.62
Pseudoword vs. Word : L1 vs. Ambiguous word : Proficiency: Cambridge	-0.011	0.035	-0.31
Pseudoword vs. Word : L1 vs. L2 word : Proficiency: Cambridge	0.0072	0.035	0.2

Supplementary Table 2

Summary of model produced by the call lmer(formula = Amp ~ Lexicality + Script + Proficiency_ACC_std + Proficiency_CAM_std + Lexicality:Script + Lexicality:Proficiency_ACC_std + Script:Proficiency_ACC_std + Lexicality:Script:Proficiency_ACC_std + Lexicality:Proficiency_CAM_std + Script:Proficiency_CAM_std + Lexicality:Script:Proficiency_CAM_std + Exposure + (1 | Participants) + (1 | Participants:Lexicality), data = Training_3070, REML = FALSE, control = lmerControl(optimizer = "bobyqa"))
Linear mixed model fit by maximum likelihood. t-tests use Kenward-Roger 's method

AIC	BIC	logLik	deviance	df.resid
34029	34224	-16984	33969	4936

Scaled residuals:

Min	1Q	Median	3Q	Max
-6.29	-0.56	-0.01	0.55	5.83

Random effects:

Groups	Term	Std.Dev.
Participants:Lexicality	(Intercept)	0.20379
Participants	(Intercept)	0.65875
Residual		7.37935

Number of obs: 4966, groups: Participants : Lexicality, 44; Participants, 22.

Fixed effects:

	Estimate	Std. Error	t value	
(Intercept)	0.33	0.18	1.8	.
Pseudoword vs. Word	0.46	0.22	2.1	*
L1 vs. Ambiguous word	0.12	0.26	0.45	
L1 vs. L2 word	0.31	0.26	1.2	
Proficiency: Picture naming	-0.38	0.22	-1.7	.
Proficiency: Cambridge	0.11	0.22	0.52	
Exposure1	-0.28	0.31	-0.89	
Exposure2	0.93	0.31	3	**
Exposure3	-0.7	0.32	-2.2	*
Exposure4	0.023	0.32	0.072	
Exposure5	0.27	0.31	0.87	
Exposure6	-0.35	0.32	-1.1	
Exposure7	-0.023	0.31	-0.073	
Exposure8	-0.1	0.32	-0.32	
Exposure9	-0.37	0.31	-1.2	
Pseudoword vs. Word : L1 vs. Ambiguous word	0.68	0.51	1.3	
Pseudoword vs. Word : L1 vs. L2 word	0.55	0.51	1.1	
Pseudoword vs. Word : Proficiency: Picture naming	-0.024	0.27	-0.092	
L1 vs. Ambiguous word : Proficiency: Picture naming	-0.43	0.31	-1.4	
L1 vs. L2 word : Proficiency: Picture naming	0.22	0.31	0.72	
Pseudoword vs. Word : Proficiency: Cambridge	0.66	0.27	2.5	*
L1 vs. Ambiguous word : Proficiency: Cambridge	0.31	0.31	1	
L1 vs. L2 word : Proficiency: Cambridge	0.019	0.31	0.061	
Pseudoword vs. Word : L1 vs. Ambiguous word : Proficiency: Picture naming	0.73	0.63	1.2	
Pseudoword vs. Word : L1 vs. L2 word : Proficiency: Picture naming	-0.85	0.63	-1.4	
Pseudoword vs. Word : L1 vs. Ambiguous word : Proficiency: Cambridge	-0.83	0.63	-1.3	
Pseudoword vs. Word : L1 vs. L2 word : Proficiency: Cambridge	1	0.63	1.6	.

Supplementary Table 3

Summary of model produced by the call lmer(formula = Amp ~ Lexicality + Script + Proficiency_ACC_std + Proficiency_CAM_std + Lexicality:Script + Lexicality:Proficiency_ACC_std + Script:Proficiency_ACC_std + Lexicality:Script:Proficiency_ACC_std + Lexicality:Script + Lexicality:Proficiency_CAM_std + Script:Proficiency_CAM_std + Lexicality:Proficiency_CAM_std + Exposure + (1 | Participants), data = Training_P200, REML = FALSE, control = lmerControl(optimizer = "bobyqa"))
Linear mixed model fit by maximum likelihood. t-tests use Kenward-Roger 's method

AIC	BIC	logLik	deviance	df.resid
37679	37855	-18813	37625	4934

Scaled residuals:

Min	1Q	Median	3Q	Max
-9.24	-0.47	0	0.48	14.4

Random effects:

Groups	Term	Std.Dev.
Participants	(Intercept)	4.3006
Residual		10.6453

Number of obs: 4961, groups: Participants, 22.

Fixed effects:

	Estimate	Std. Error	t value	
(Intercept)	5.1	0.93	5.5	***
Pseudoword vs. Word	0.27	0.3	0.89	
L1 vs. Ambiguous word	-0.55	0.37	-1.5	
L1 vs. L2 word	0.28	0.37	0.75	
Proficiency: Picture naming	-0.57	1.1	-0.5	
Proficiency: Cambridge	1.6	1.1	1.4	
Exposure1	-0.71	0.45	-1.6	
Exposure2	0.31	0.45	0.69	
Exposure3	0.78	0.46	1.7	.
Exposure4	0.24	0.47	0.52	
Exposure5	0.56	0.45	1.2	
Exposure6	0.012	0.45	0.026	
Exposure7	-0.1	0.45	-0.23	
Exposure8	-0.48	0.46	-1.1	
Exposure9	-0.84	0.46	-1.8	.
Pseudoword vs. Word : L1 vs. Ambiguous word	1.7	0.74	2.2	*
Pseudoword vs. Word : L1 vs. L2 word	-1.3	0.74	-1.7	.
Pseudoword vs. Word : Proficiency: Picture naming	0.23	0.37	0.63	
L1 vs. Ambiguous word : Proficiency: Picture naming	0.67	0.45	1.5	
L1 vs. L2 word : Proficiency: Picture naming	-1.2	0.45	-2.6	**
Pseudoword vs. Word : Proficiency: Cambridge	-0.28	0.37	-0.76	
L1 vs. Ambiguous word : Proficiency: Cambridge	-0.44	0.45	-0.98	
L1 vs. L2 word : Proficiency: Cambridge	0.35	0.45	0.77	
Pseudoword vs. Word : L1 vs. Ambiguous word : Proficiency: Picture naming	-0.73	0.74	-0.98	
Pseudoword vs. Word : L1 vs. L2 word : Proficiency: Picture naming	0.61	0.74	0.82	

Supplementary Table 4

Summary of model produced by the call lmer(formula = Ampb ~ Lexicality + Script + Proficiency_ACC_std + Proficiency_CAM_std + Lexicality:Script + Lexicality:Proficiency_ACC_std + Script:Proficiency_ACC_std + Lexicality:Script:Proficiency_ACC_std + Lexicality:Script + Lexicality:Proficiency_CAM_std + Script:Proficiency_CAM_std + Lexicality:Proficiency_CAM_std + Exposure + (1 | Participants) + (1 | Participants:Lexicality) + (1 | Participants:Script), data = Training_400, REML = FALSE, control = lmerControl(optimizer = "bobyqa"))

Linear mixed model fit by maximum likelihood. t-tests use Kenward-Roger 's method

AIC	BIC	logLik	deviance	df.resid
35950	36139	-17946	35892	4930

Scaled residuals:

Min	1Q	Median	3Q	Max
-5.28	-0.57	-0.02	0.59	4.63

Random effects:

Groups	Term	Std.Dev.
Participants:Script	(Intercept)	0.71804
Participants:Lexicality	(Intercept)	0.00000
Participants	(Intercept)	4.73690
Residual		8.92565

Number of obs: 4959, groups: Participants : Script, 66; Participants : Lexicality, 44; Participants, 22.

Fixed effects:

	Estimate	Std. Error	t value	
(Intercept)	4.2	1	4.1	***
Pseudoword vs. Word	0.0022	0.25	0.0088	
L1 vs. Ambiguous word	0.34	0.38	0.9	
L1 vs. L2 word	0.94	0.38	2.5	*
Proficiency: Picture naming	0.64	0.95	0.67	
Proficiency: Cambridge	1.3	1.2	1.2	
Exposure1	-0.92	0.38	-2.4	*
Exposure2	0.062	0.38	0.16	
Exposure3	0.57	0.38	1.5	
Exposure4	0.19	0.39	0.48	
Exposure5	1.1	0.38	2.9	**
Exposure6	-0.041	0.38	-0.11	
Exposure7	0.26	0.38	0.67	
Exposure8	-0.02	0.38	-0.052	
Exposure9	-0.49	0.38	-1.3	
Pseudoword vs. Word : L1 vs. Ambiguous word	0.61	0.62	0.98	
Pseudoword vs. Word : L1 vs. L2 word	-2	0.62	-3.2	**
Pseudoword vs. Word : Proficiency: Picture naming	-0.26	0.31	-0.84	
L1 vs. Ambiguous word : Proficiency: Picture naming	0.19	0.46	0.4	
L1 vs. L2 word : Proficiency: Picture naming	-0.68	0.46	-1.5	

Pseudoword vs. Word : Proficiency: Cambridge	0.074	0.31	0.24	
L1 vs. Ambiguous word : Proficiency: Cambridge	-0.17	0.46	-0.38	
L1 vs. L2 word : Proficiency: Cambridge	0.26	0.46	0.56	
Pseudoword vs. Word : L1 vs. Ambiguous word : Proficiency: Picture naming	-1.8	0.62	-2.8	**
Pseudoword vs. Word : L1 vs. L2 word : Proficiency: Picture naming	0.65	0.62	1	