

Supplemental results

Letter	Letter frequency (%)	Letter complexity	Pre-test accuracy (%)
a	8.53	156	39
b	1.40	177	47
c	3.18	119	22
d	3.84	176	43
e	12.55	154	71
f	2.10	159	82
g	1.96	180	50
h	4.79	173	69
i	7.34	120	48
j	0.11	131	79
k	0.75	163	50
l	4.14	120	54
m	2.38	194	81
n	7.35	150	27
o	7.67	118	33
p	2.04	191	71
q	0.09	188	29
r	6.71	126	45
s	6.79	137	57
t	8.93	127	45
u	2.62	141	62
v	1.06	130	43
w	1.65	178	69
x	0.20	155	65
y	1.72	161	79
z	0.11	132	54

Table S1. Letter complexity, letter frequency, and pre-test accuracy for each of the 26 letters. Pre-test accuracy was calculated across all six groups.

Predictive term	Coefficient	95% CI	sr ²
log(Letter exposure)	16.23	[4.88, 27.64]	0.08
Letter frequency	-1.14	[-1.61, -0.73]	0.06
Letter complexity	-0.10	[-0.17, -0.03]	0.02
log(Pre-test accuracy)	-37.04	[-51.92, -24.08]	0.37
log(Letter exposure): log(Pre-test accuracy)	-7.72	[-14.36, -1.19]	0.01
Intercept	89.8	[65.30, 116.86]	

Table S2. Results of regression model for improvement ($R^2 = 0.58$; $R^2_{adj} = 0.56$). Dependent variable is middle-letter improvement. Predictors are three-letter exposure, letter frequency, letter complexity, and pre-test performance. 95% CI—95% bootstrapped confidence interval. sr²—the squared semipartial correlation.

Predictive term	Coefficient	95% CI	sr ²
log(Letter exposure)	30.92	[14.97, 49.85]	0.12
Letter frequency	-0.49	[-0.77, -0.24]	0.02
Letter complexity	-0.07	[-0.11, -0.03]	0.02
log(Pre-test accuracy)	-51.09	[-74.45, -23.87]	0.44
log(Letter exposure): log(Pre-test accuracy)	-15.37	[-25.43, -6.82]	0.03
Intercept	111.33	[62.17, 155.38]	

Table S3. Results of regression model for improvement ($R^2 = 0.71$; $R^2_{adj} = 0.70$). Dependent variable is three-letter improvement. Predictors are three-letter exposure, letter frequency, letter complexity, and pre-test (three-letter) performance. 95% CI—95% bootstrapped confidence interval. sr²—the squared semipartial correlation.

Predictive term	Coefficient	95% CI	sr ²
log(Letter exposure)	20.79	[7.31, 35.23]	0.12
Letter frequency	-1.09	[-1.56, -0.67]	0.06

Letter complexity	-0.09	[-0.15, -0.02]	0.02
log(Pre-test accuracy)	-34.38	[-48.93, -21.45]	0.33
log(Letter exposure): log(Pre-test accuracy)	-9.81	[-18.10, -1.94]	0.02
Intercept	81.84	[58.55, 107.17]	

Table S4. Results of regression model for improvement when including trials with target misplacement errors and treating misplaced responses as incorrect ($R^2 = 0.57$; $R^2_{adj} = 0.56$). Dependent variable is middle-letter improvement. Predictors are middle-letter exposure, letter frequency, letter complexity, and pre-test performance. 95% CI—95% bootstrapped confidence interval. sr^2 —the squared semipartial correlation.

Predictive term	Coefficient	95% CI	sr^2
log(Letter exposure)	21.17	[7.11, 35.61]	0.07
Letter frequency	-1.14	[-1.62, -0.74]	0.06
Letter complexity	-0.09	[-0.16, -0.03]	0.02
log(Pre-test accuracy)	-38.58	[-53.03, -24.38]	0.38
log(Letter exposure): log(Pre-test accuracy)	-10.35	[-18.62, -2.34]	0.02
Intercept	92.12	[66.78, 119.25]	

Table S5. Results of regression model for improvement when including trials with target misplacement errors and treating misplaced responses as correct ($R^2 = 0.58$; $R^2_{adj} = 0.57$). Dependent variable is middle-letter improvement. Predictors are middle-letter exposure, letter frequency, letter complexity, and pre-test performance. 95% CI—95% bootstrapped confidence interval. sr^2 —the squared semipartial correlation.