

Table S1*Participant demographics for HS and L2 subgroups (means, standard deviations and ranges)*

	Heritage speakers (N=22, Female=17)	Sequential L2ers (N=42, Female=26)
Age	22.5 (<i>SD</i> = 7.6) (18-55)	23.0 (<i>SD</i> = 4.4) (18-36)
Length of stay in Mandarin speaking environment (in months)	51.9 (<i>SD</i> = 65.1) (0-220)	12.4 (<i>SD</i> = 19.1) (0-84)
LexTALE_CH score (Corrected Accuracy, range: -60–60)	22.8 (<i>SD</i> = 13.8) (-6-42)	18.1 (<i>SD</i> = 13.7) (-19-37)
Self-rating of overall Mandarin language ability (1-10)	6.1 (<i>SD</i> = 1.4) (3-8)	5.9 (<i>SD</i> = 1.6) (3-10)

Table S2*RQ1: Model output for fixation bias by CR (L1ers: n=59; CLs: n=60)*

<i>Predictors</i>	<i>Estimate</i>	<i>SE</i>	<i>df</i>	<i>t</i>	<i>p</i>
CR1					
(Intercept)	-0.10	0.05	31.98	-1.98	0.06
Verb type	0.01	0.10	31.69	0.10	0.92
Group (CL vs. L1)	0.01	0.03	116.53	0.17	0.87
Group (HS vs. L2)	-0.05	0.04	114.03	-1.33	0.19
Verb type * Group (CL vs. L1)	-0.02	0.06	1790.88	-0.28	0.78
Verb type * Group (HS vs. L2)	0.07	0.08	1788.89	0.91	0.36
CR2					
(Intercept)	-0.04	0.05	31.58	-0.68	0.50
Verb type	-0.35	0.11	31.58	-3.23	0.003
Group (CL vs. L1)	-0.02	0.03	1964.02	-1.11	0.27
Group (HS vs. L2)	-0.07	0.04	1964.05	-1.90	0.06
Verb type * Group (CL vs. L1)	-0.07	0.05	1964.02	-1.27	0.20
Verb type * Group (HS vs. L2)	0.07	0.07	1964.05	0.95	0.34

Formula for CR1: lmer (log-ratio fixation bias ~ Verb Type * Group + (1 | participant) + (1 |

item)); Formula for CR2: lmer (log-ratio fixation bias ~ Verb Type * Group + (1 | item))

Table S3*RQ1: Model output for fixation bias by Verb Type (L1ers: n=59; CLs: n=60)*

<i>Predictors</i>	<i>Estimate</i>	<i>SE</i>	<i>df</i>	<i>t</i>	<i>p</i>
MAKE verbs (PO only)					
(Intercept)	0.01	0.07	15.54	0.19	0.85
CR	0.25	0.04	17.50	6.11	<0.001
Group (CL vs. L1)	0.01	0.03	115.33	0.27	0.79
Group (HS vs. L2)	-0.10	0.04	113.93	-2.26	0.03
CR* Group (CL vs. L1)	-0.01	0.05	1702.15	-0.14	0.89
CR* Group (HS vs. L2)	-0.02	0.08	1701.99	-0.22	0.82
TELL verbs (DO only)					
(Intercept)	-0.15	0.07	16.53	-2.10	0.05
CR	-0.11	0.03	17.36	-3.42	0.003
Group (CL vs. L1)	-0.03	0.03	113.59	-1.04	0.30
Group (HS vs. L2)	-0.03	0.04	112.45	-0.62	0.54
CR* Group (CL vs. L1)	-0.06	0.05	689.07	-1.10	0.27
CR* Group (HS vs. L2)	-0.02	0.08	681.86	-0.22	0.82

Formula for MAKE verbs: lmer (log-ratio fixation bias ~ CR * Group + (1 | participant) + (1 + CR | item)); Formula for TELL verbs: lmer (log-ratio fixation bias ~ CR * Group + (1 + CR | participant) + (1 + CR | item))

Table S4*RQ1: Model output for fixation bias by classroom learners (CLs) to explore **proficiency effects****(n=60)*

<i>Predictors</i>	<i>Estimate</i>	<i>SE</i>	<i>df</i>	<i>t</i>	<i>p</i>
LexTALE score					
(Intercept)	-0.08	0.05	30.99	-1.43	0.16
CR	0.08	0.03	1963.04	2.91	0.004
Verb type	-0.15	0.11	30.99	-1.39	0.17
LexTALE score	0.03	0.01	1963.30	2.00	0.05
CR * Verb type	-0.34	0.05	1963.04	-6.53	<0.001
CR * LexTALE score	-0.03	0.03	1963.09	-1.00	0.32
Verb type * LexTALE score	-0.04	0.03	1963.30	-1.41	0.16
CR * Verb type * LexTALE score	-0.01	0.05	1963.09	-0.26	0.80

Formula: lmer (log-ratio fixation bias ~ CR * Verb Type * Scale(LexTALE score) + (1 | item))

Table S5

RQ1: Model output for fixation bias by classroom learners (CLs) to explore effects of a non-English vs. English dominant language (n=60)

<i>Predictors</i>	<i>Estimate</i>	<i>SE</i>	<i>df</i>	<i>t</i>	<i>p</i>
(Intercept)	-0.08	0.05	31.22	-1.40	0.17
CR	0.08	0.03	1823.18	2.87	0.004
Verb type	-0.14	0.11	32.64	-1.31	0.20
English	0.00	0.03	27.45	0.14	0.89
CR * Verb type	-0.34	0.05	1823.11	-6.334	<0.001
CR * English	-0.01	0.05	1822.95	-0.11	0.91
Verb type * English	-0.03	0.07	35.95	-0.40	0.67
CR * Verb type * English	-0.03	0.10	1822.89	-0.28	0.78

Formula: lmer (log-ratio fixation bias ~ CR * Verb Type * English) + (1 + Verb Type | participant) + (1 + English | item))

Table S6*RQ2: Model output for fixation bias by CR (L1ers: n=59; CLs: n=60)*

<i>Predictors</i>	<i>Estimate</i>	<i>SE</i>	<i>df</i>	<i>t</i>	<i>p</i>
CR1					
(Intercept)	-0.17	0.05	25.02	-3.37	0.002
Verb bias	0.06	0.08	77.46	0.79	0.43
Group (CL vs. L1)	-0.02	0.04	165.22	-0.59	0.56
Group (HS vs. L2)	-0.09	0.06	162.90	-1.47	0.14
Verb bias * Group (CL vs. L1)	-0.02	0.07	1123.94	-0.24	0.81
Verb bias * Group (HS vs. L2)	0.08	0.11	1122.50	0.79	0.43
CR2					
(Intercept)	-0.11	0.06	20.76	-1.93	0.07
Verb bias	0.41	0.08	100.86	5.30	<0.001
Group (CL vs. L1)	-0.03	0.04	1268.13	-0.79	0.43
Group (HS vs. L2)	0.10	0.05	1268.23	1.90	0.06
Verb bias * Group (CL vs. L1)	0.00	0.07	1268.13	0.06	0.95
Verb bias * Group (HS vs. L2)	-0.18	0.10	1268.21	-1.74	0.08

Formula for CR1: lmer (log-ratio fixation bias ~ Verb Bias * Group + (1 | participant) + (1 |

item)); Formula for CR2: lmer (log-ratio fixation bias ~ Verb Bias * Group + (1 | item))

Table S7*RQ2: Model output for fixation bias by Verb bias (L1ers: n=59; CLs: n=60)*

<i>Predictors</i>	<i>Estimate</i>	<i>SE</i>	<i>df</i>	<i>t</i>	<i>p</i>
PO-bias verbs					
(Intercept)	-0.05	0.05	15.61	-0.86	0.40
CR	0.21	0.03	20.10	7.13	<0.001
Group (CL vs. L1)	-0.03	0.03	112.88	-1.02	0.31
Group (HS vs. L2)	-0.02	0.04	110.94	-0.46	0.65
CR* Group (CL vs. L1)	0.01	0.05	1708.94	0.14	0.89
CR* Group (HS vs. L2)	0.06	0.08	1707.49	0.71	0.48
DO-bias verb					
(Intercept)	-0.20	0.08	5.13	-2.53	0.05
CR	-0.02	0.05	688.01	-0.49	0.62
Group (CL vs. L1)	-0.02	0.04	688.03	-0.51	0.61
Group (HS vs. L2)	0.03	0.06	688.06	0.47	0.64
CR* Group (CL vs. L1)	-0.02	0.09	688.00	-0.18	0.86
CR* Group (HS vs. L2)	0.32	0.13	688.01	2.49	0.01

Formula for PO-bias verbs: lmer (log-ratio fixation bias ~ CR * Group + (1 | participant) + (1 +

CR | item)); Formula for DO-bias verbs: lmer (log-ratio fixation bias ~ CR * Group + (1 | item))

Table S8

RQ2: Model output for fixation bias for the DO-bias verb by CR (L1: n=59; CLs: n=60)

<i>Predictors</i>	<i>Estimate</i>	<i>SE</i>	<i>df</i>	<i>t</i>	<i>p</i>
CR1					
(Intercept)	-0.19	0.07	5.35	-2.87	0.03
Group (CL vs. L1)	-0.01	0.06	337.03	-0.24	0.81
Group (HS vs. L2)	-0.13	0.09	337.12	-1.46	0.15
CR2					
(Intercept)	-0.21	0.10	5.16	-2.06	0.09
Group (CL vs. L1)	-0.03	0.06	346.02	-0.50	0.62
Group (HS vs. L2)	0.19	0.09	346.04	2.10	0.04

Formula for CR1 and CR2: $\text{lmer}(\text{log-ratio fixation bias} \sim \text{Group} + (1 | \text{item}))$

Note. There was no fixation difference by Group in CR1; while L2ers looked more to the theme than HSs following the DO-biased verb in CR2 ($b=.19, p=.04$).

Table S9

RQ2: Model output for fixation bias for the DO-bias verb by 3 groups (L1: n=59; L1: n=38;

HS: n=22)

<i>Predictors</i>	<i>Estimate</i>	<i>SE</i>	<i>df</i>	<i>t</i>	<i>p</i>
L2					
(Intercept)	-0.18	0.11	5.02	-1.55	0.18
CR	0.14	0.07	183.34	1.95	0.053
HS					
(Intercept)	-0.21	0.08	5.05	-2.60	0.05
CR	-0.17	0.09	122.09	-1.87	0.06
L1					
(Intercept)	-0.21	0.06	4.95	-3.42	0.02
CR	-0.03	0.07	337.00	-0.52	0.61

Formula for L2ers: lmer (log-ratio fixation bias ~ CR + (1 | participant) + (1 | item)); Formula

for HSs and L1ers: lmer (log-ratio fixation bias ~ CR + (1 | item))

Note. L2ers had marginally more looks to the theme in CR2 for the DO biased verb ($b=.14$, $p=.053$), whereas HSs looked marginally more to the recipient ($b=-.17$, $p=.06$). No fixation change was found among the L1ers ($b=-.03$, $p=.61$).

Table S10*RQ2: Model output for fixation bias by classroom learners (CLs) to explore **proficiency effects****(n=60)*

<i>Predictors</i>	<i>Estimate</i>	<i>SE</i>	<i>df</i>	<i>t</i>	<i>p</i>
(Intercept)	-0.12	0.05	22.52	-2.22	0.04
CR	0.12	0.04	1215.87	3.47	<0.001
Verb bias	0.21	0.08	95.03	2.77	0.007
LexTALE score	0.02	0.02	78.18	0.86	0.39
CR * Verb bias	0.19	0.07	1215.68	2.77	0.006
CR * LexTALE score	-0.06	0.04	1215.08	-1.70	0.09
Verb bias * LexTALE score	0.00	0.04	1215.08	0.10	0.92
CR * Verb bias * LexTALE score	0.14	0.07	1214.79	1.97	0.05

Formula: $\text{lmer}(\text{log-ratio fixation bias} \sim \text{CR} * \text{Verb Bias} * \text{Scale}(\text{LexTALE}) + (1 \mid \text{participant}) +$

$(1 \mid \text{item}))$

Table S11*RQ2: Model output for fixation bias for CLs to explore proficiency effects by CR (n=60)*

<i>Predictors</i>	<i>Estimate</i>	<i>SE</i>	<i>df</i>	<i>t</i>	<i>p</i>
CR1					
(Intercept)	-0.16	0.05	23.46	-2.89	0.008
Verb bias	0.03	0.09	51.31	0.31	0.76
Scale(LexTALE)	0.04	0.03	18.79	1.37	0.19
Verb bias * Scale(LexTALE)	-0.06	0.06	24.80	-1.06	0.30
CR2					
(Intercept)	-0.07	0.06	20.28	-1.17	0.26
Verb bias	0.37	0.10	59.22	3.79	<0.001
Scale(LexTALE)	-0.02	0.02	629.66	-0.61	0.54
Verb bias * Scale(LexTALE)	0.07	0.05	629.98	1.48	0.14

Formula for CR1: lmer (log-ratio fixation bias ~ Verb bias * Scale(LexTALE) + (1 | participant)

+ (1 + Scale(LexTALE) | item)); Formula for CR2: lmer (log-ratio fixation bias ~ Verb bias *

Scale(LexTALE) + (1 | participant) + (1 | item))

Table S12

RQ2: Model output for fixation bias for CLs to explore proficiency effects by Verb bias (n=60)

<i>Predictors</i>	<i>Estimate</i>	<i>SE</i>	<i>df</i>	<i>t</i>	<i>p</i>
PO-bias verbs					
(Intercept)	-0.04	0.06	15.01	-0.69	0.50
CR	0.22	0.04	925.04	5.83	<0.001
Scale(LexTALE)	0.02	0.02	925.28	0.90	0.37
CR * Scale(LexTALE)	0.01	0.04	925.03	0.25	0.80
DO-bias verb					
(Intercept)	-0.19	0.10	5.00	-1.90	0.12
CR	0.02	0.06	346.01	0.44	0.66
Scale(LexTALE)	0.01	0.03	346.09	0.47	0.64
CR * Scale(LexTALE)	-0.13	0.06	346.01	-2.27	0.02

Formula for PO-bias and DO-bias verbs: lmer (log-ratio fixation bias ~ CR * Scale(LexTALE)

+ (1 | item))

Note. We further split the data for the DO-bias verb by CR to explore the significant CR by Scale(LexTALE) interaction. See Table S13 for model output.

Table S13

RQ2: Model output for fixation bias for CLs to explore proficiency effects with data for DO-bias verb by CR (n=60)

<i>Predictors</i>	<i>Estimate</i>	<i>SE</i>	<i>df</i>	<i>t</i>	<i>p</i>
CR1					
(Intercept)	-0.20	0.08	5.02	-2.62	0.05
Scale(LexTALE)	0.08	0.04	169.15	2.10	0.04
CR2					
(Intercept)	-0.18	0.13	5.00	-1.41	0.22
Scale(LexTALE)	-0.05	0.04	172.06	-1.22	0.22

Formula for CR1 and CR2 : `lmer (log-ratio fixation bias ~ Scale(LexTALE) + (1 | item))`

Table S14

RQ2: Model output for fixation bias among classroom learners (CLs) to explore effects of an English vs. non-English dominant language (n=60)

<i>Predictors</i>	<i>Estimate</i>	<i>SE</i>	<i>df</i>	<i>t</i>	<i>p</i>
(Intercept)	-0.12	0.05	22.84	-2.23	0.04
CR	0.12	0.04	1214.68	3.22	0.001
Verb bias	0.22	0.08	96.68	2.81	0.006
English	0.01	0.04	84.90	0.28	0.78
CR * Verb bias	0.21	0.07	1214.60	2.94	0.003
CR * English	0.05	0.07	1214.68	0.72	0.47
Verb bias * English	-0.04	0.07	1216.30	-0.59	0.56
CR * Verb bias * English	-0.16	0.14	1214.61	-1.08	0.28

Formula: lmer (log-ratio fixation bias ~ CR * Verb Bias * English) + (1 | participant) + (1 | item))