Daily life events are temporally compressed in working memory depending on their duration

Working memory capacity for continuous events: the impact of event duration

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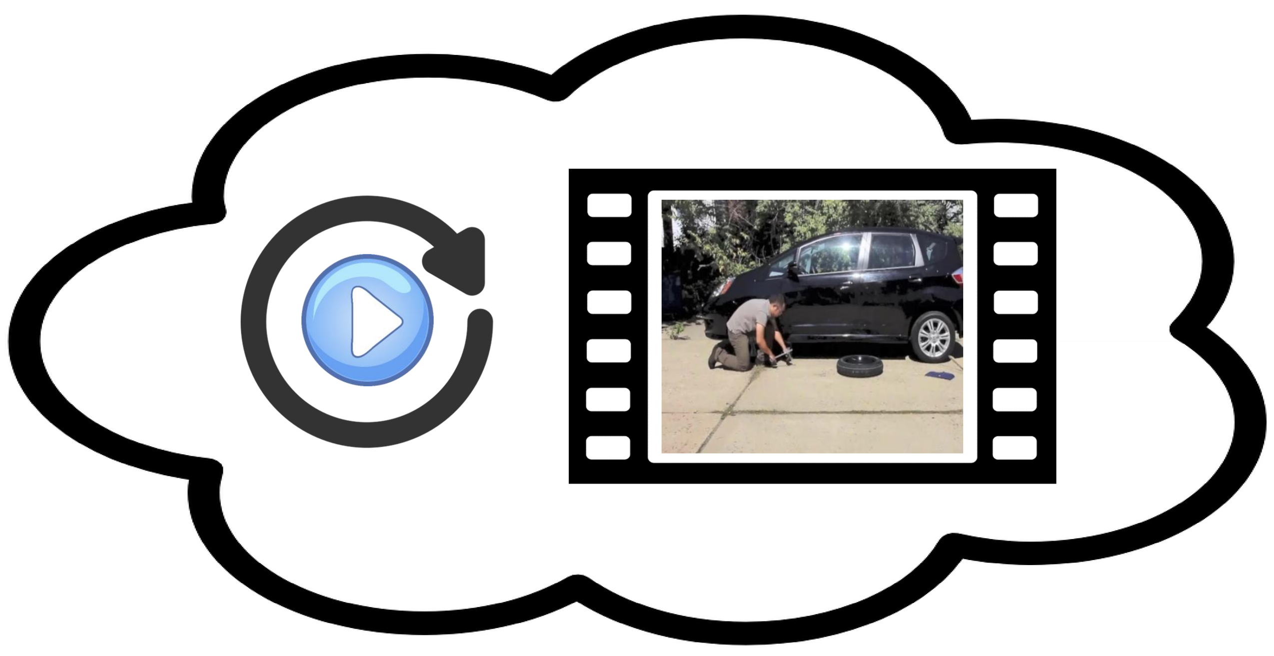
Remembering the unfolding of a past episode usually takes less time than its actual duration.
Such **temporal compression** could emerge when events are too long to be fully held in **working memory**.

Immediate **mental replay**

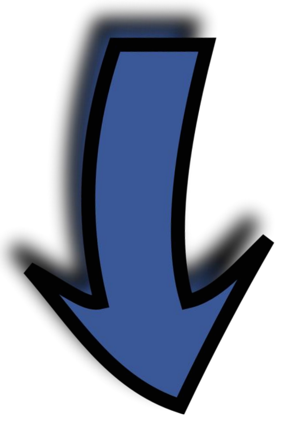


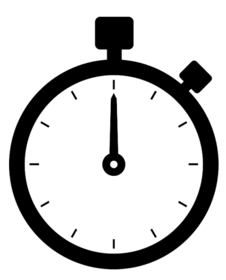
90 healthy young adults

25 video clips of everyday activities:

Lasting **3, 6, 9, 12, or 15 seconds**

Depicting **continuous actions** (e.g., turning a car jack), performed **without interruption**





Temporal ratio
Mental replay duration/ Event duration
(values < 1 indicate memory compression)

Between 9 and 12 seconds, remembering duration became significantly shorter than video duration; **temporal ratio fell below 1.**

Beyond a certain duration (situated between 9 and 12 seconds), continuous events start to exceed working memory capacity (the temporal limit of working memory).

Temporal compression of episodic memories could result from the partial encoding of these events.

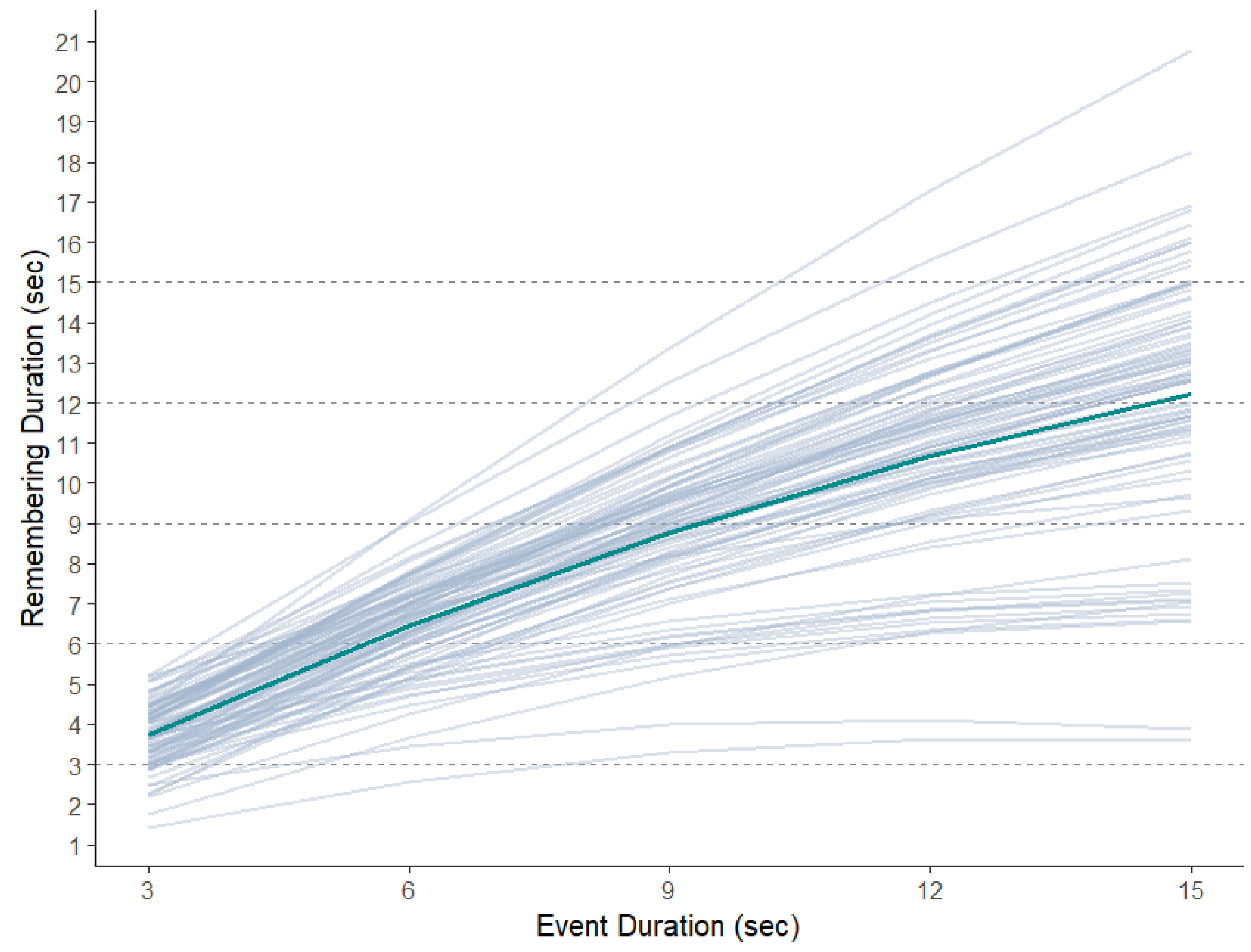
→ Temporal compression seems a by-product of the limit of working memory capacity in representing continuous events.

Remembering duration

Descriptive statistics

Event Duration	Min	Q1	Median	Q3	Max
3	1.92	3.16	3.74	4.17	5.20
6	2.19	5.61	6.69	7.41	9.12
9	2.13	7.96	8.74	10.14	13.28
12	3.22	9.07	10.92	12.23	18.48
15	2.98	10.96	12.63	14.34	22.18

Growth curve analysis (linear mixed-effects model)



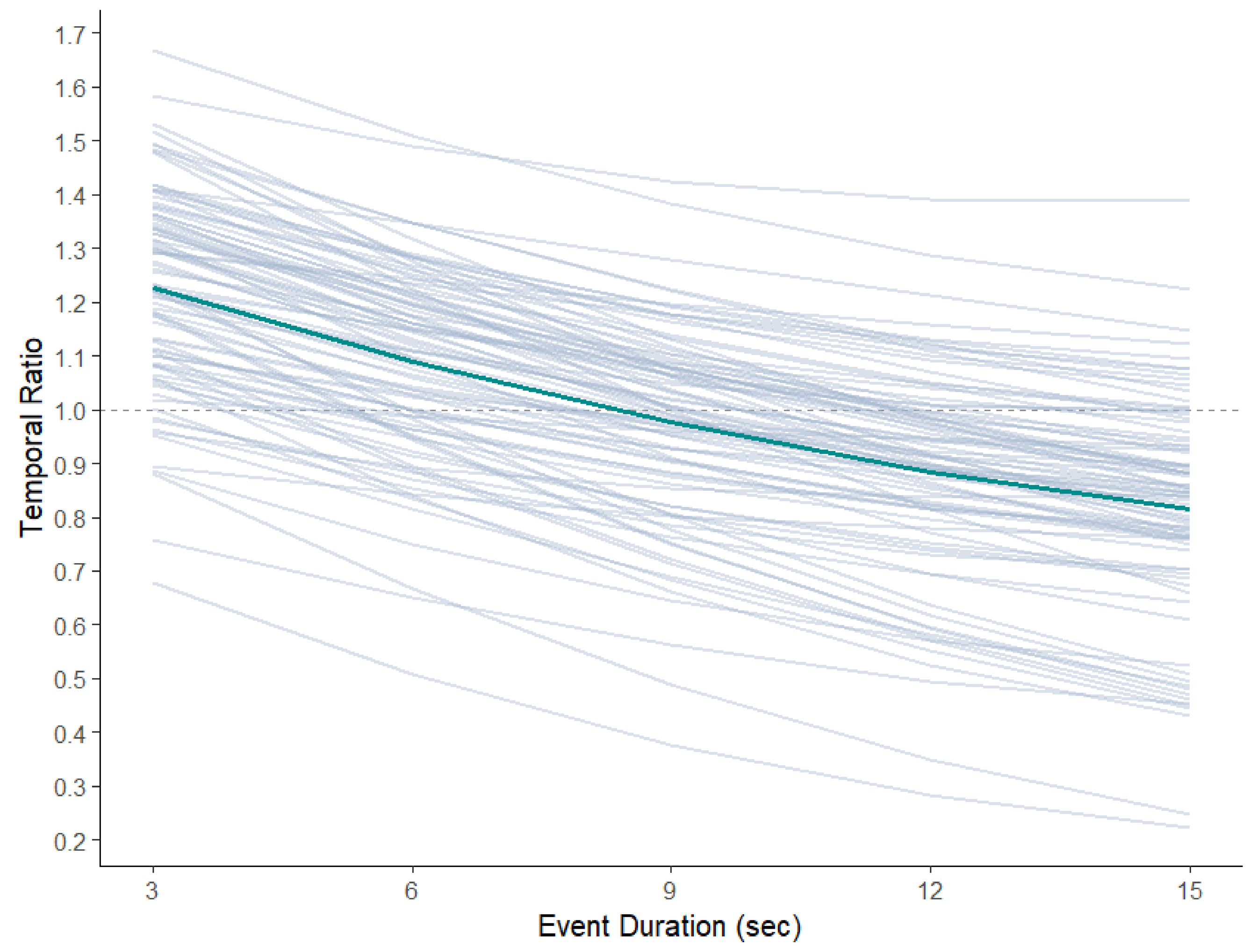
Linear term: $b = 6.71$, 95% CI [6.18, 7.24], $t(89) = 24.82$ ($p < .001$)
Quadratic term: $b = -0.73$, 95% CI [-0.89, -0.57], $t(89) = -8.78$ ($p < .001$)

Temporal ratio

Descriptive statistics

Event Duration	Min	Q1	Median	Q3	Max
3	0.64	1.05	1.25	1.39	1.73
6	0.36	0.94	1.12	1.24	1.52
9	0.24	0.88	0.97	1.13	1.48
12	0.27	0.76	0.91	1.02	1.54
15	0.20	0.73	0.84	0.96	1.48

Growth curve analysis (linear mixed-effects model)



Linear term: $b = -0.32$, 95% CI [-0.37, -0.28], $t(89) = -15.65$ ($p < .001$)
Quadratic term: $b = 0.04$, 95% CI [0.02, 0.07], $t(89) = 3.62$ ($p < .001$)

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Pre-registration