

THE IMPACT OF EDUCATION IN THE PRIMACY AND RECENCY EFFECTS IN COGNITIVELY HEALTHY AGING

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Background

The Serial Position Effect (SPE) describes the preference for primacy and recency words, in detriment of words in the middle, when freely recalling items in a word-list test (Figure 1) [1].

Sociodemographic factors such as age and education are well known to influence memory and learning strategies. When comparing SPE in age groups, older adults learn fewer words and present higher forgetting rates for words in the middle and recency positions than younger adults [2]. Education seems to have an influence in SPE but is still well described.

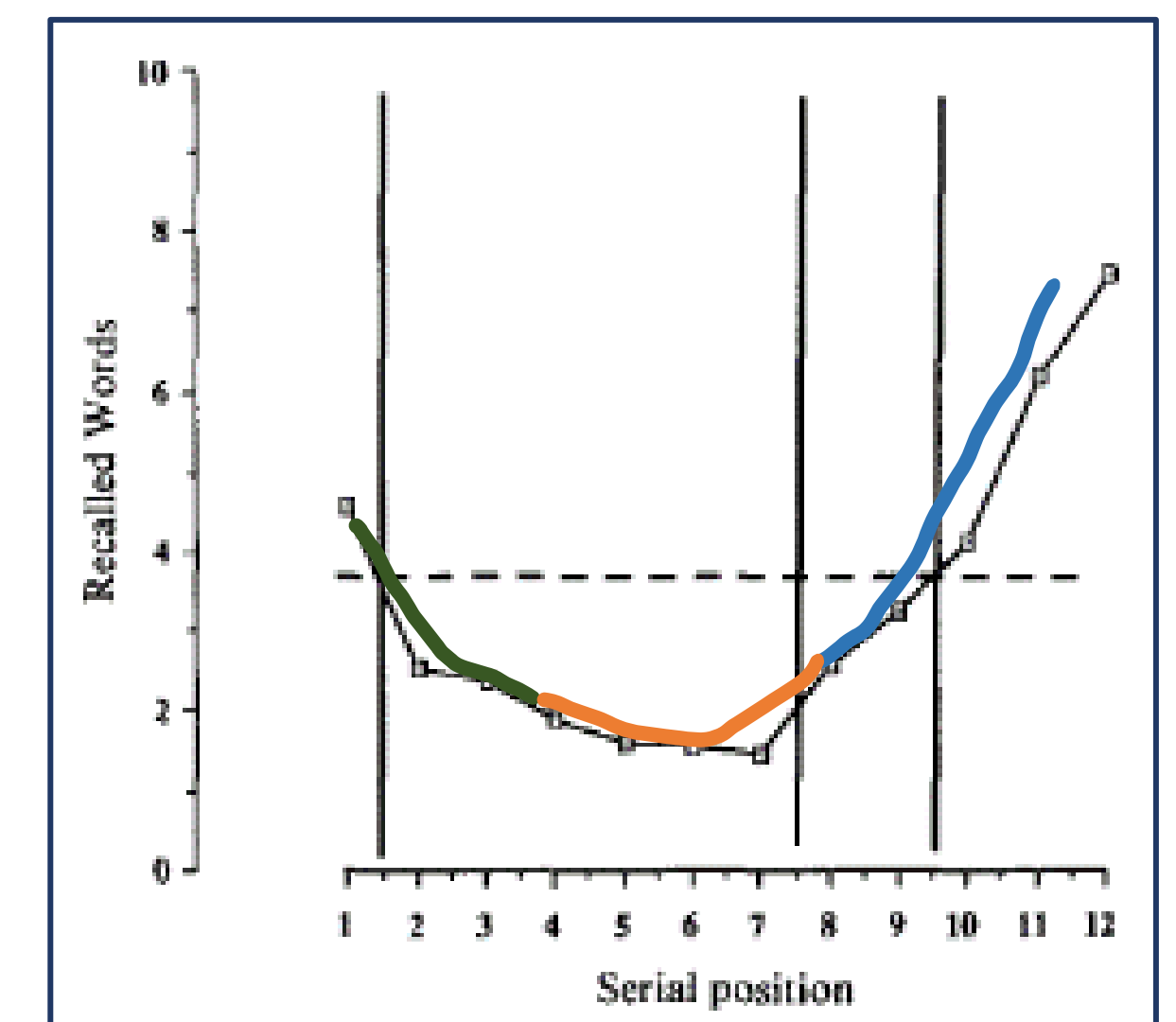


Figure 1.

Aims

1) To evaluate if wordlist acquisition varies according to level of education; 2) To explore if different levels of education differ in serial position effect.

Methods

A total of **294 healthy adults**, with ≥ 50 years old, Portuguese native speakers with no history of Neuropsychiatric conditions, were divided according to level of education:

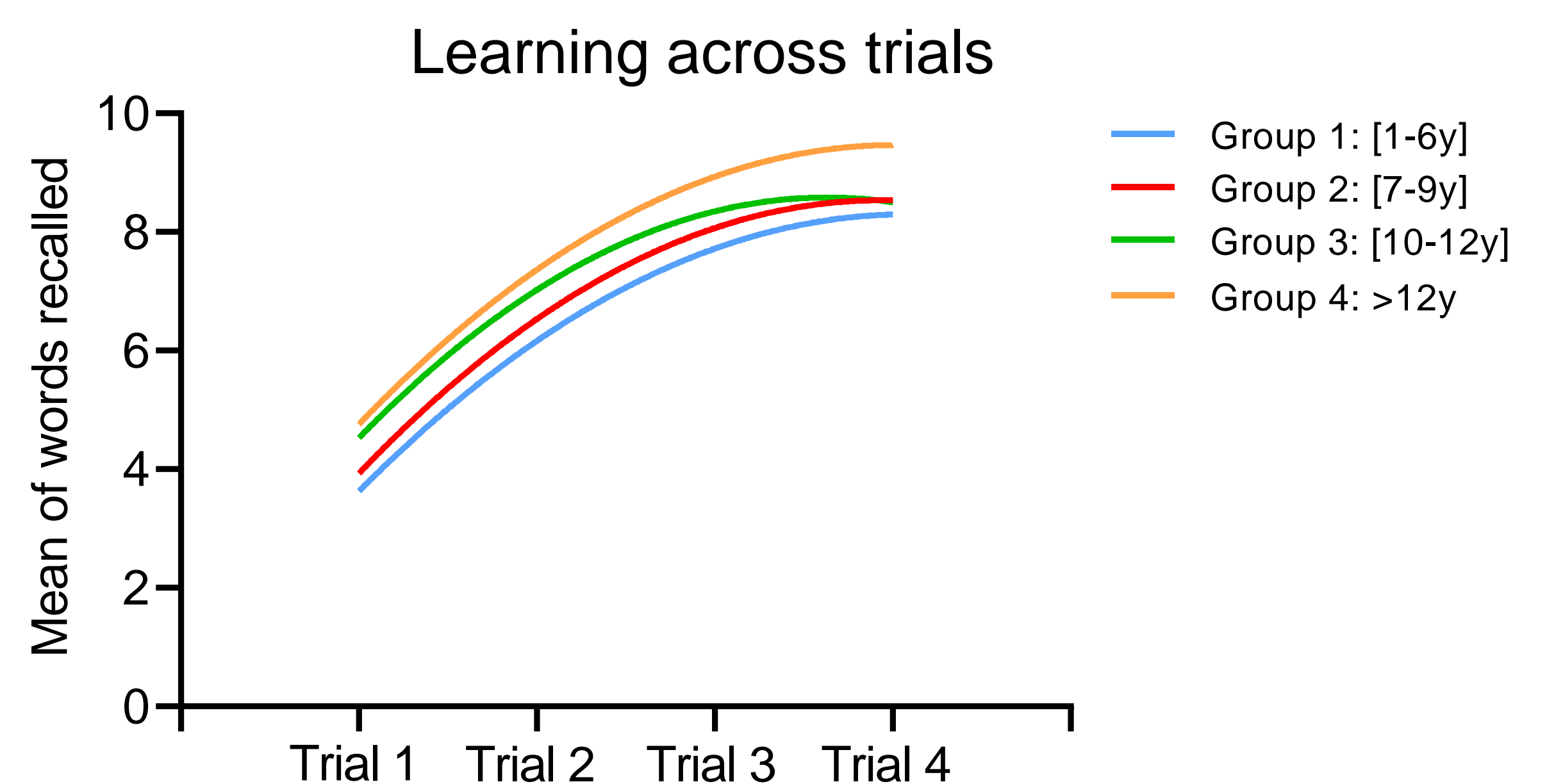
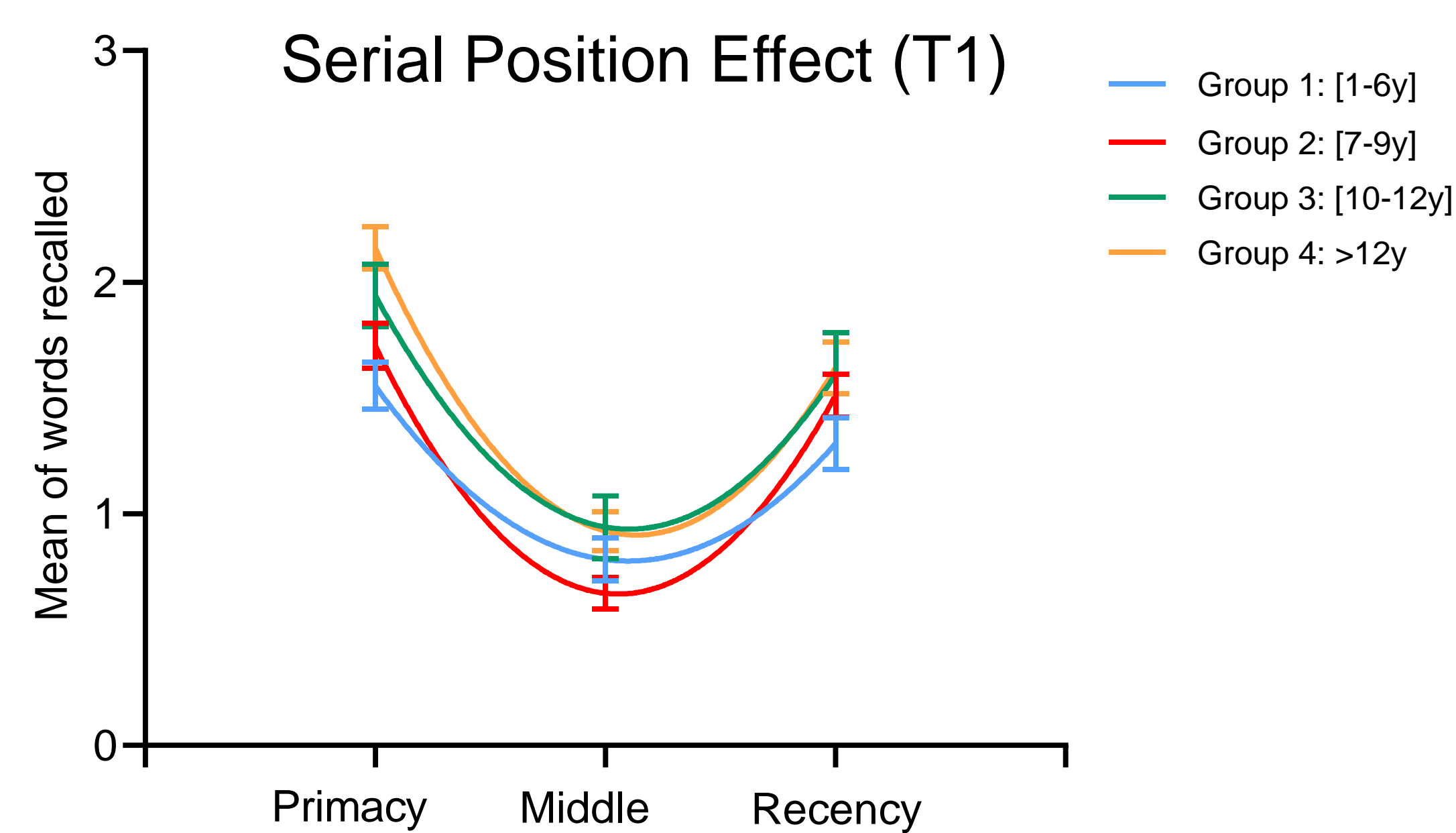
Group 1	Group 2	Group 3	Group 4
[1 – 6y]	[7 – 9y]	[10 – 12y]	>12y
N = 76	N = 102	N = 35	N = 81

Learning and SPE were assessed using the Auditory Wordlist Learning Test (AWLT) from the Cognitive Function Dementia Test Set (Vienna's Computerized Test System).

Primacy	Middle	Recency
sofá uva barca cinto	prego circo lobo cravo	sé bombo forno cofre

Participants were assessed in 4 consecutive trials of immediate free recall.

Results



Differences between groups in primacy and recency (T1 & T4)

	Group 1	Group 2	Group 3	Group 4	F	p	Groups
P1%	0.39±0.22	0.43±0.25	0.49±0.2	0.54±0.21	6.41	<0.001	G1<G4
						0.011	G2<G4
R1%	0.33±0.24	0.38±0.24	0.4±0.27	0.41±0.25	1.62	0.18	-
P4%	0.81±0.2	0.83±0.2	0.85±0.19	0.9±0.17	3.54	0.018	G1<G4
R4%	0.63±0.25	0.66±0.25	0.69±0.29	0.78±0.23	5.69	<0.001	G1<G4
						0.011	G2<G4

Differences between groups across trials

	Group 1	Group 2	Group 3	Group 4	F	p	Groups
T1	3.61±1.5	3.89±1.39	4.49±1.46	4.7±1.65	8.55	0.026	G1<G3
						<0.001	G1<G4
						0.002	G2<G4
T2	6.22±1.74	6.64±1.75	7.14±1.96	7.52±2.07	7.06	<0.001	G1<G4
						0.01	G2<G4
T3	7.66±1.91	7.96±1.76	8.23±1.97	8.8±1.9	5.46	0.001	G1<G4
							G2<G4
T4	8.32±1.73	8.57±1.95	8.54±2.21	9.52±1.81	6.22	<0.001	G1<G4
						0.005	G2<G4

Discussion and Conclusions

The classic "U" shaped curve was obtained, demonstrating SPE in all groups. Higher educated groups recall more primacy words than the less educated groups, demonstrating that education provides easier transfer of information to long-term stores associated with primacy effect.

When analyzing learning, the lower educated groups recall less words in all learning trials. Nevertheless, all groups presented a similar learning rate with identical learning curves suggesting that education potentiates a natural ability to learn new information, resulting in higher recall rates.

These results show that: 1) education has an impact in the SPE; 2) higher level of education is closely related with overall better performance in cognitive tasks; and 3) the recency effect across trials might be a differentiating factor between groups.

References: 1 Capitani, E., Della Sala, S., Logie, R. H., & Spinnler, H. (1992). Recency, Primacy, and Memory: Reappraising and Standardising the Serial Position Curve. *Cortex*, 28(3), 315–342. [2] Griffin, J. W., John, S. E., Adams, J. W., Bussell, C. A., Saurman, J. L., & Gavett, B. E. (2017). The effects of age on the learning and forgetting of primacy, middle, and recency components of a multi-trial word list. *Journal of Clinical and Experimental Neuropsychology*, 39(9), 900–912.

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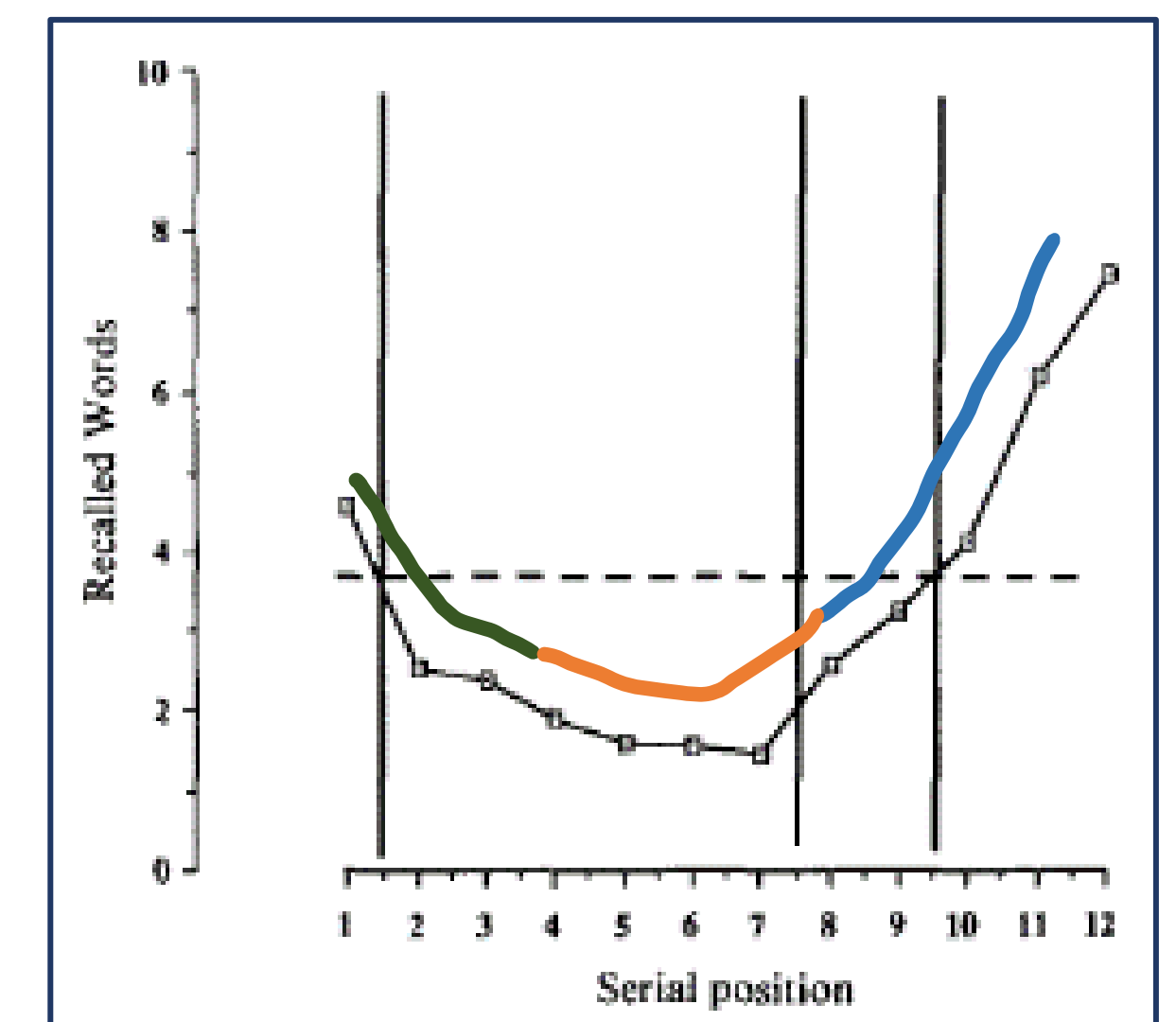


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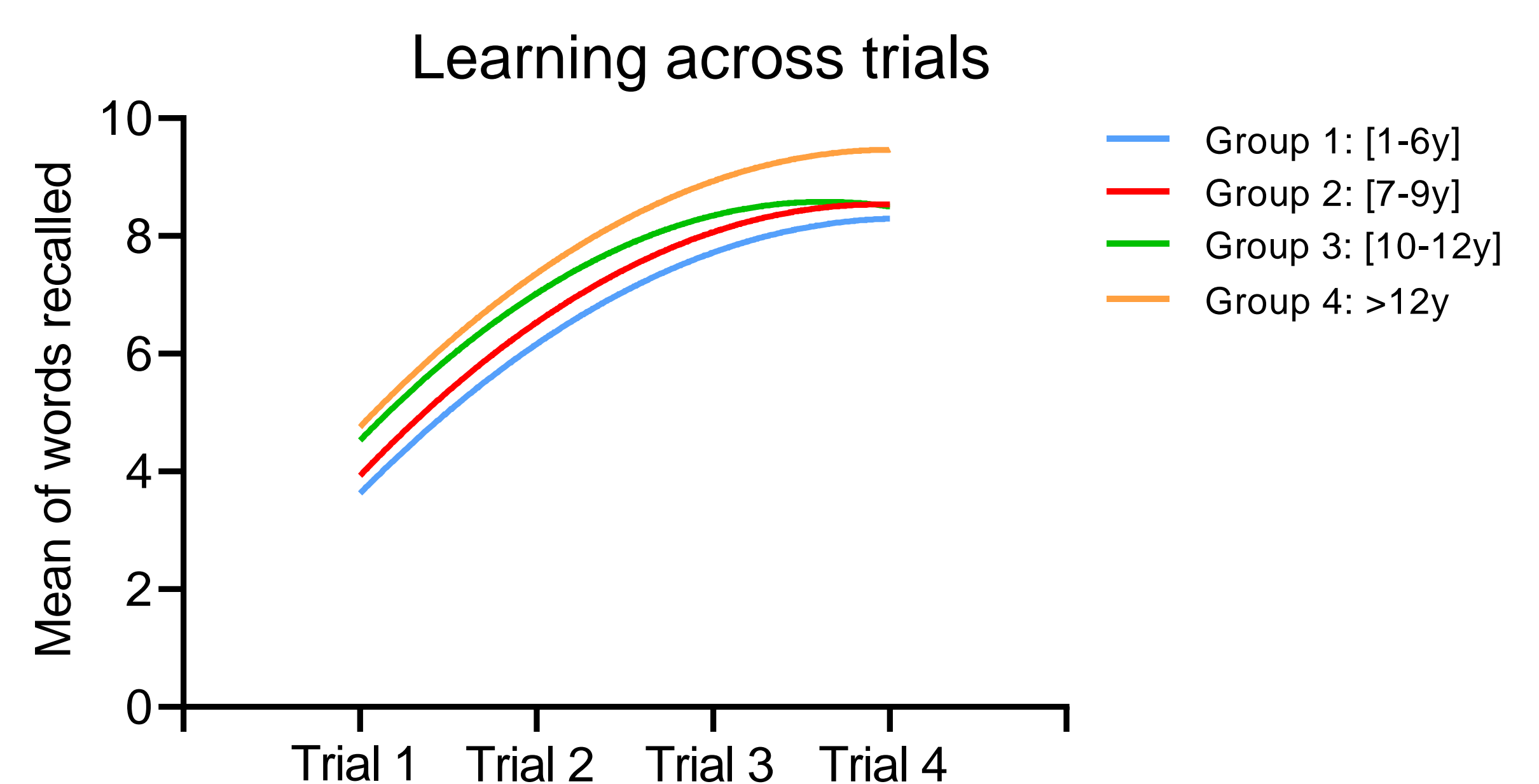
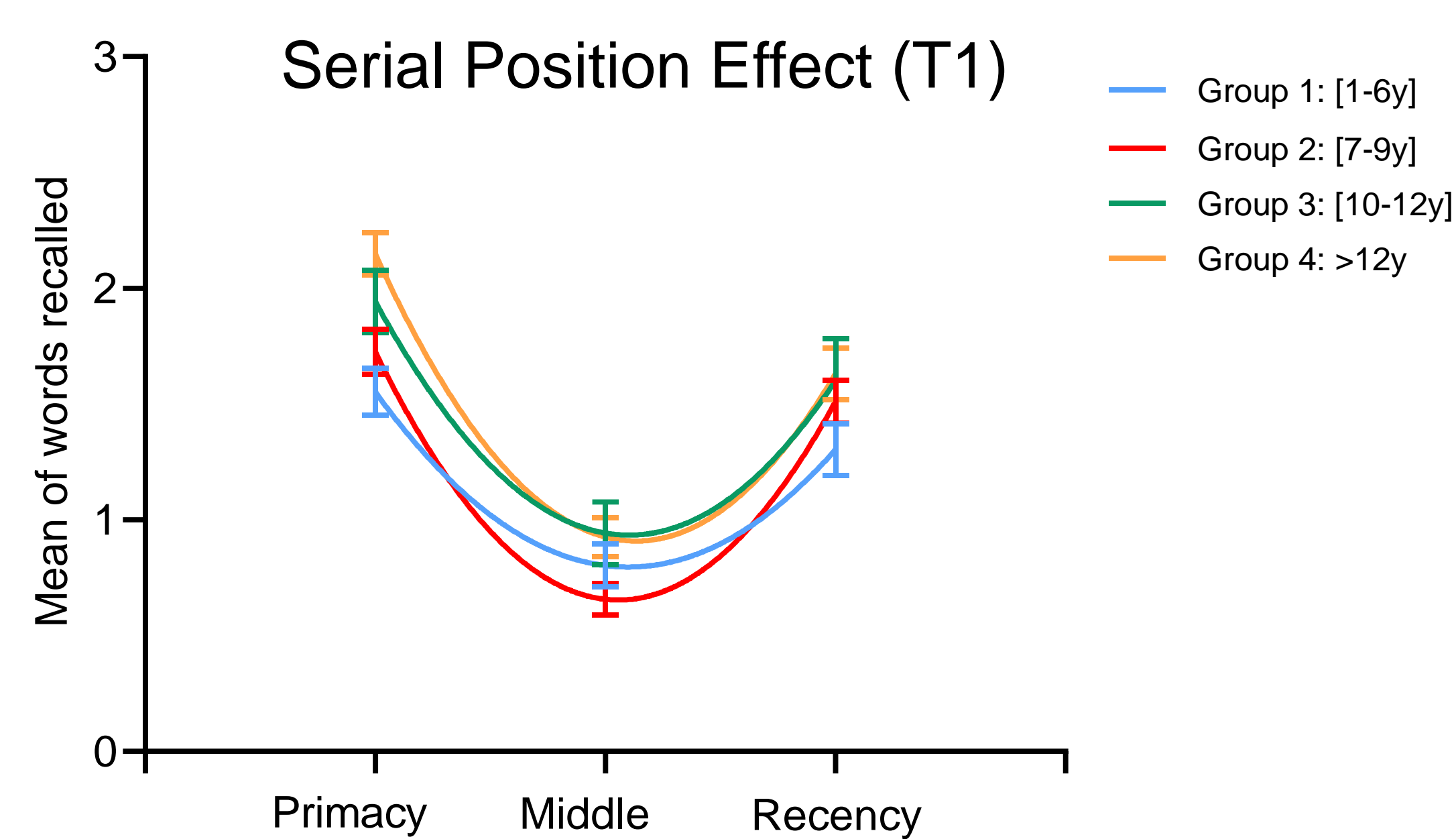
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