

Developing a New Mnemonic Strategy

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Background

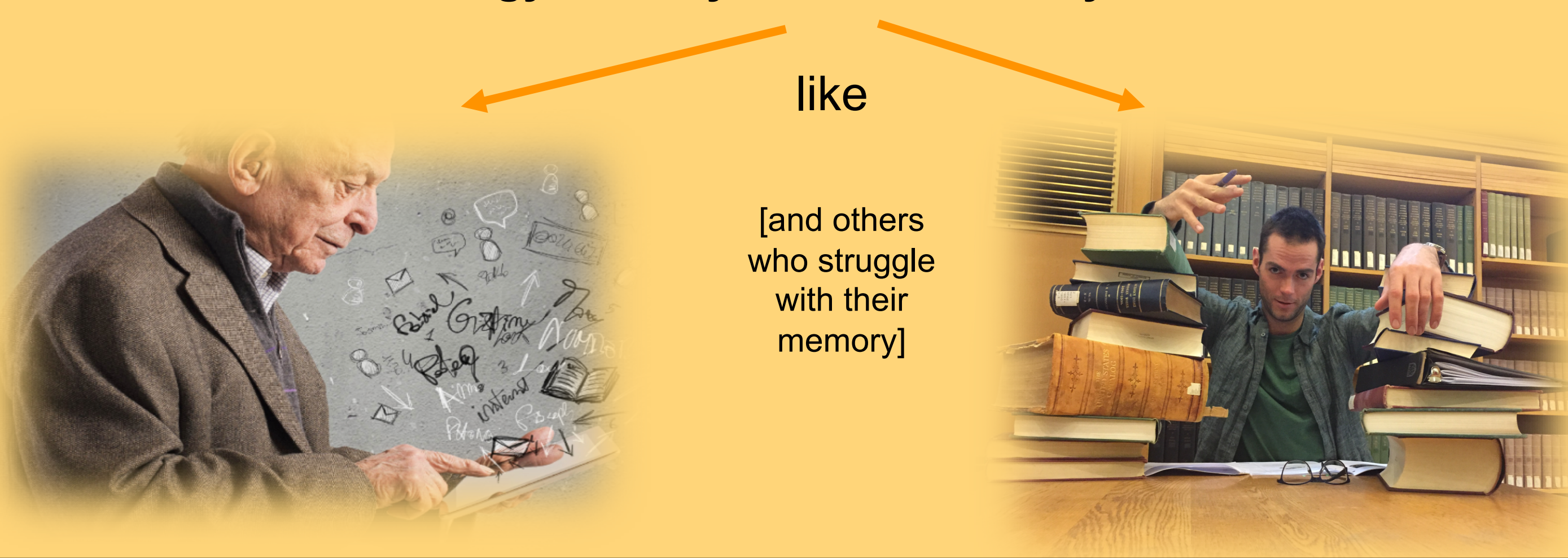
- **Mnemonic strategy** = memory aids that use existing memories as a scaffold to encode new information; used by memory athletes who compete in championships world-wide
- Extraordinary memory skills **not** associated with extraordinary brain anatomy or general cognitive superiority, but acquired through deliberate **training in mnemonic strategies** (Dresler and Konrad, 2013)
- Mnemonic strategies such as the method of loci (MoL, "memory palace", encoding study items in known environment) **effective in younger adults** (Caplan et al., 2019, Worthen and Hunt, 2011) but **not in seniors** (Karchach & Verhaeghen, 2014)
- Visuospatial mnemonics such as MoL engage **hippocampus** (Bechetti, 2010), which is active during mental navigation (Bellmund et al., 2016) and in **episodic memory** encoding and retrieval (Monaco et al., 2014)
- Hippocampus: one of **first** brain regions **affected** by Alzheimer's disease (Apostolova et al., 2006.)
- **Autobiographical memories** relatively independent of hippocampus (Cabeza & St Jacques, 2007)

Experiment 1: Methods

- **Participants:** 50 UofA students completed a 110 min session for course credit
- **Screening criteria:** learned English before the age of six, older than 17 years
- **Task:** a) typed life-story in ten sentences
b) memorized 9 (7) lists of ten random words by visualizing them as part of the story
c) recalled the word lists in the presented order
d) saw original sentences in random order and typed the words they integrated (strategy use validation)
- **Groups:** (1): saw their original life-story and retyped it with the list words integrated
(2): only saw list words and mentally integrated them into their life-story
(3): saw their whole life-story and integrated the list words mentally
(4): saw one word and sentence at a time and integrated words mentally
(5) control group: typed a story, but received no instruction

THE VISION

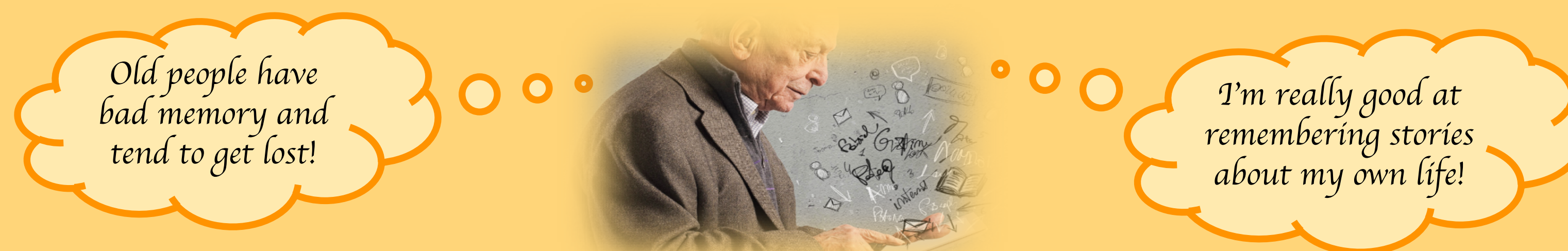
A new mnemonic strategy used by **PEOPLE** in daily life to remember things



The Challenge: Even if trained, **SENIORS** fail to use mnemonics (Karchach & Verhaeghen, 2014) presumably because of their...

... neurodegenerative impairment of **hippocampus**
...low perceived self-efficacy in memory tasks

The Paradox: poor performance and confidence in **episodic and visuospatial memory** vs. excellent confidence in **autobiographical memory**



The Solution: Using the form of memory seniors excel in to study new information

AUTOBIOGRAPHICAL MNEMONIC STRATEGY

Goals: validating efficacy of the autobiographical mnemonic strategy & finding the best mode of instruction

...Retrieval structure

'Because [Paul] is an absolute **UNIT**, he invited me to stay at this apartment in Vancouver; we boarded a ferry there.'

'We ate at the cafeteria on the ferry and played cards, no **DEVICES** around, just people living in the moment.'

'In Vancouver we boarded a bus to Chris' apartment, there was a **TURKEY** on the bus, which was strange and unexpected but that's just how it is sometimes.'

'Afterward we stopped at his apartment to drop off my belongings and because he had to **COPY** some documents before heading out again.'

'Our first task in Vancouver was to find Breka Bakery because their poppy seed cake is **GENIUS** and I wanted some.'

Original Story...

Original Story (1st half)

'[Paul] and I took a ferry to Vancouver for an overnight trip.'

'We ate at the cafeteria on the ferry and played cards.'

'In Vancouver, we boarded a bus to Chris' apartment, the ride was very long.'

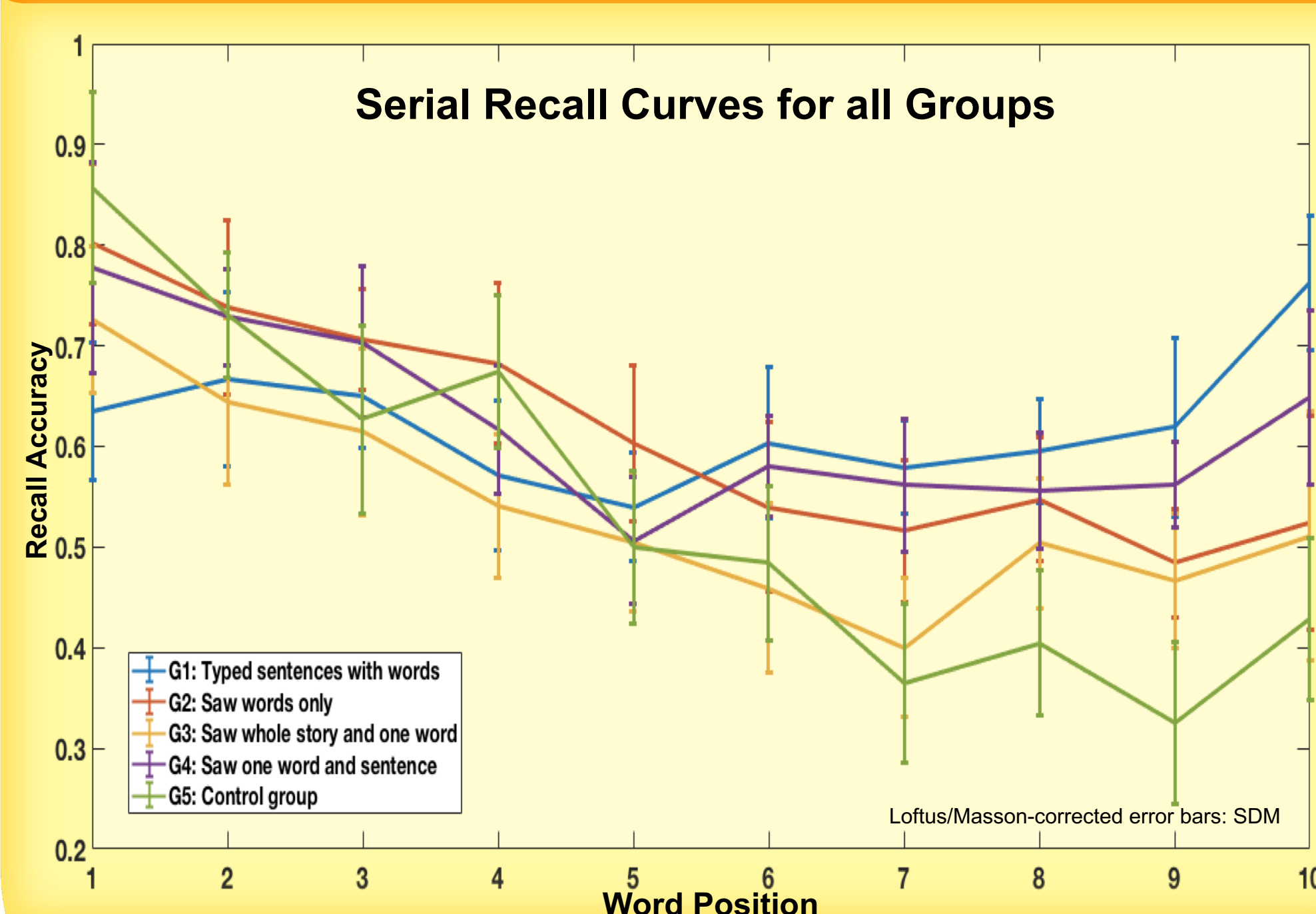
'Afterward we stopped at his apartment to drop off my belongings before heading out.'

'Our first task was to find Breka Bakery and buy poppy seed cake.'

List words (1st half)

UNIT – DEVICE – TURKEY – COPY – GENIUS

Results & Discussion

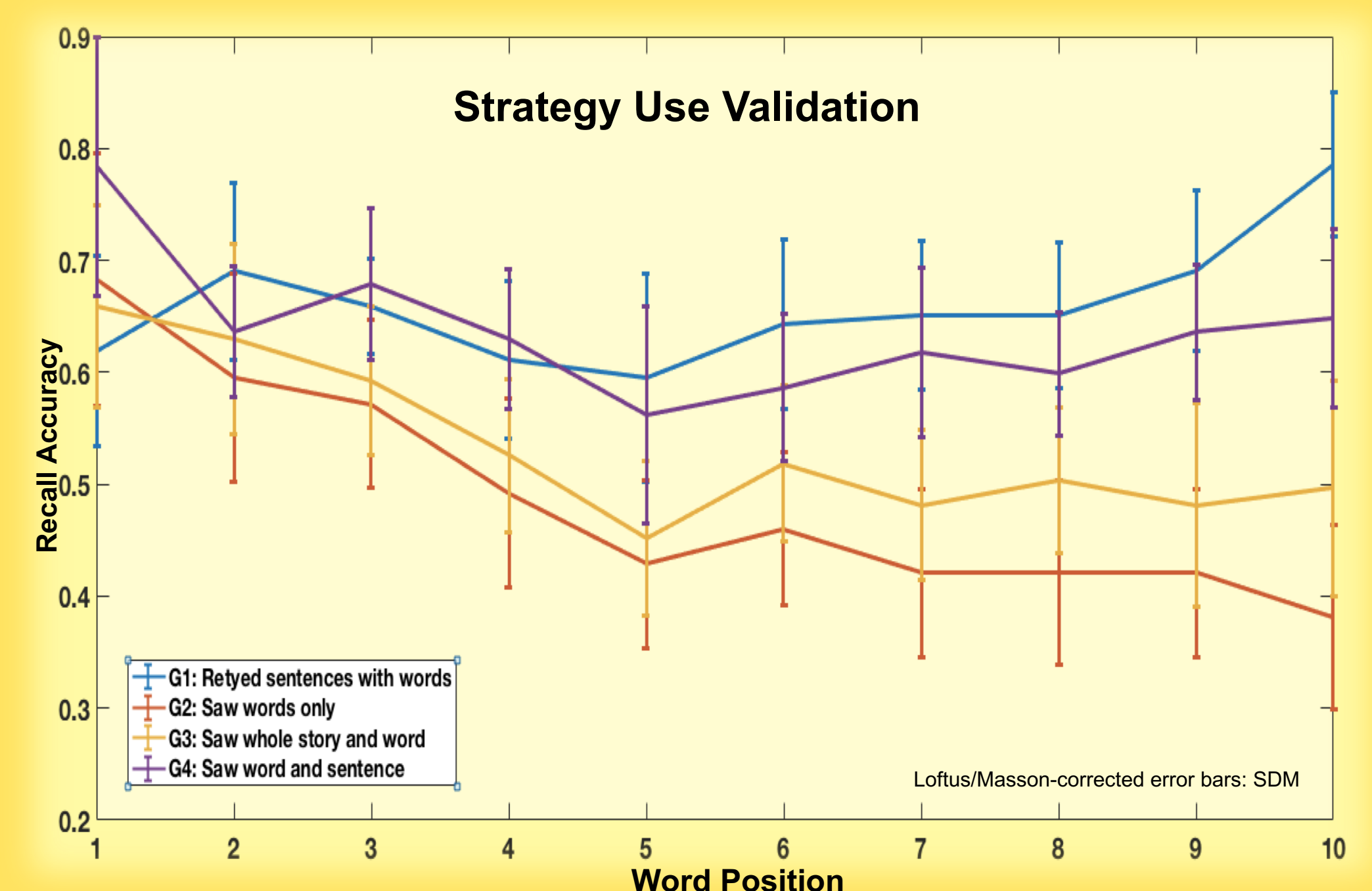


Preliminary Results of Ongoing data Collection:

- Life-story groups show higher recall probability than **control group**
 - Autobiographical memories serve as effective retrieval structures!
- High recall probability in **G1**
 - Higher cognitive involvement when writing (Berthold et al., 2004)
- High recall probability in **G4**
 - Effective encoding with low cognitive load
- Lower recall probability in **G3**
 - Higher cognitive load from reading full story as distraction

Strategy use validation:

- **G1 & G4** associated words with sentences of their story
- **G2 & G3** might have used different or no memorization techniques



→ The **autobiographical mnemonic strategy** is an effective memory aid, especially when **life-story is retyped** and when **one word and sentence are shown at a time!**

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