

Memory 3

Transience (Forgetting)

- Ebbinghaus
- For "Flashbulb Memories"
- Spacing Effect During Learning
- Aging

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Transience of Memory

- Transience = forgetting that occurs with the passage of time
- Scientific understanding of transience can be traced to a book by Hermann Ebbinghaus in 1885
 - Consonant/Vowel/Consonant nonsense syllables
 - **Not:** D-O-T or B-O-L
 - **Possible:** D-A-X B-O-K Y-A-T

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After learning a list of 30 nonsense syllables you are tested after either 9 hours or 1 month. Do you think you would forget more of the list in the first 9 hours or during the interval **between** 9 hours and 1 month?

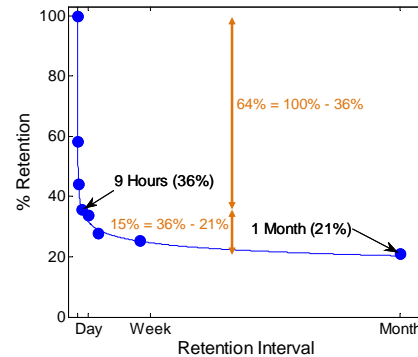
- A. More forgotten in 9 hours than between 9 hours and 1 month.
- B. About the same amount forgotten in 9 hours than between 9 hours and 1 month.
- C. Less forgotten in 9 hours than between 9 hours and 1 month.

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Ebbinghaus Forgetting Function



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Ebbinghaus's Other Contributions

- Memorization time increases sharply with the number of syllables
- Distributing learning over time is more effective than learning in a single session
- A small amount of initial practice leads to savings for later learning
- Continuing to practice material after it is "learned" enhances retention
- Primacy and recency effects
- Meaningful versus nonsense material

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- For the last slide I used decisions you might make while studying to illustrate some of Ebbinghaus's findings. Is that reasonable? How do we know that what he found *generalizes* to your study situation? After all he studied only himself over a century ago, using nonsense stimuli, in an artificial setting. Given what you know, would you consider altering your study habits based on Ebbinghaus's results?

- A. Yes, definitely
- B. Possibly
- C. Probably not
- D. Definitely not

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Internal and External Validity

- External validity question
How reasonable is it to generalize results from an experiment to other persons, places, times?
 - Replication
 - Proximal similarity
- Internal validity question
How reasonable is it to infer that the manipulation in an experiment caused an observed change?

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Talarico & Rubin, 2003 Description

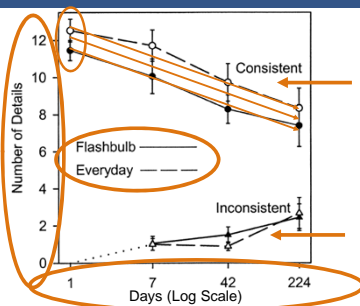
- Interviewed 54 Duke students on September 12, 2001 and recorded
 - How they had learned of the attacks the previous morning
 - Details of some other memorable incident in their personal lives occurring in the last 3 days
- 3 randomly chosen subsets of these 18 participants were asked for the same information after one of 3 delays
 - 7 days
 - 42 days
 - 244 days

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Talarico & Rubin, 2003 Results

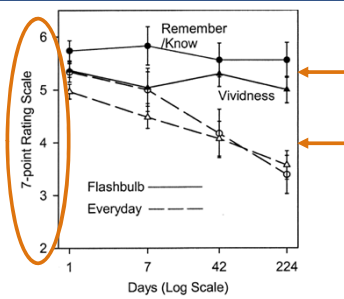


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Talarico & Rubin, 2003 Results



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Summary: Transience

- Ebbinghaus first described the time course of transience.
- Our confidence in the generality of his results is increased by the many times they have been replicated using different materials, procedures, and participants.
- Transience occurs at the same rate for different materials
- Data about transience do not always match our intuitions

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- You have need to learn a list of 30 facts that you will be using for at least the next year. How would you allocate your time to study them?
- Study in the list in **a single session** until you know all the items.
 - Study the list one day until you know the facts fairly well. Wait a **day** and then study the list again until you know all the items.
 - Study the list one day until you know the facts fairly well. Wait a **week** and then study the list again until you know all the items.
 - Study the list one day until you know the facts fairly well. Wait a **month** and then study the list again until you know all the items.

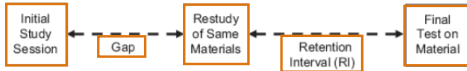
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N. J. Cepeda, et al. (2008) Spacing Effects in Learning

Psychological Science, 11, 1095 - 1102

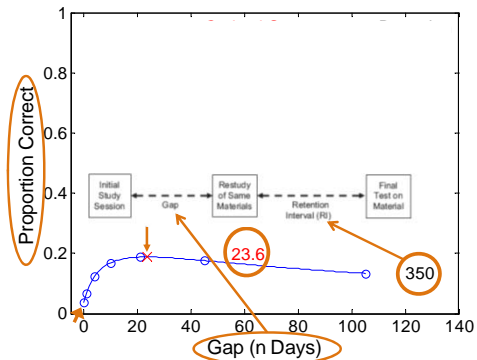


- Gaps (days): 0, 1, 2, 4, 7, 21, 105
- Retention Intervals: 7, 35, 70, 350
- Initial study session: 32 facts learned
Example: What European nation consumes the most spicy Mexican food?
- Restudy: entire list of questions was run through twice
- Final Test: Tested once on each question

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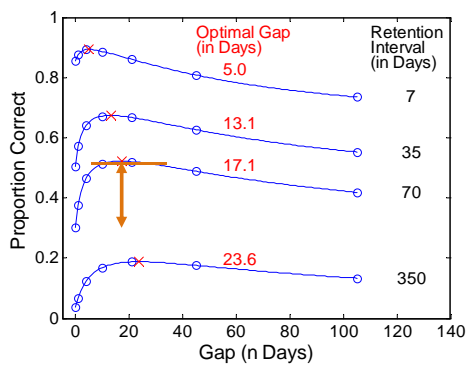
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■ Compared with that of your parents, would you say that your memory for past events is

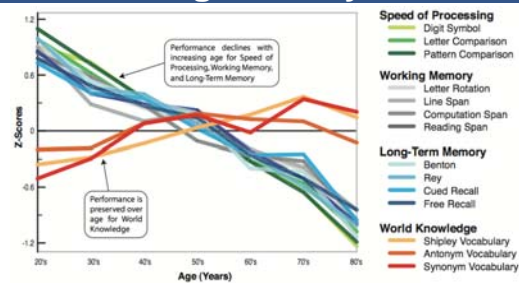
- Much better
- A little better
- About the same
- A little worse
- Much worse

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Age-Related Cognitive Decline Begins Early

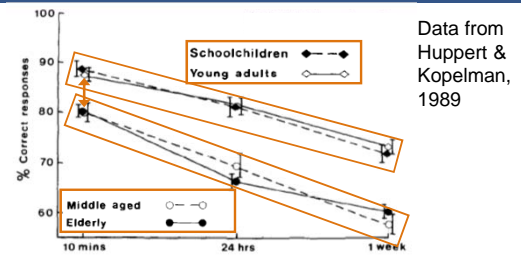


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Transience and Aging



Data from
Huppert &
Kopelman,
1989

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- Summary Question
Which of the statements A-D below is *false*?
- A. Transience is the loss, over time, of information that had been stored in memory.
 - B. Ebbinghaus studied transience under carefully controlled conditions but it has been replicated with more natural stimuli and conditions.
 - C. Degree of transience depends on the content of a memory trace.
 - D. Transience is influenced by aging.
 - E. All of statements A – D are correct.

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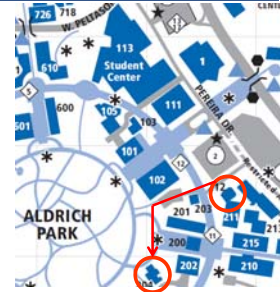
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Looking Ahead

- Next Wednesday
Memory Chapter Test
- For Friday
 - Gleitman: Ch. 8,
pp. 327-337
 - Zap #9:
False Memory Task
- Coffee at Phoenix Grill?



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