

Long-Term Memory

- Introduction
 - STM versus LTM
 - Episodic Memory
 - Semantic Memory
 - Procedural Memory
- Encoding in Long-Term Memory
 - Depth of Processing (Levels of Processing)
 - Self Reference Effect
 - Encoding Specificity Principle

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Long-Term Memory 2

- Retrieval in Long-Term Memory
 - Explicit versus Implicit Memory
 - Very Long-Term Memory
 - Expertise
 - Amnesia
- Autobiographical Memory
 - Flashbulb Memories
 - Schemas & Autobiographical Memory
 - Source Monitoring
 - Eyewitness Testimony

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Tulving: Multiple Memory Systems

- Episodic
- Semantic
- Procedural

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Encoding in LTM

- Levels (Depth) of Processing
- Self-Reference Effect
- Encoding Specificity Principle

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Levels of Processing Framework

- Craik & Lockhart (1972)
- Type of Processing
 - Physical (Shallow) Processing
 - Meaningful (Deep) Processing
- Memory Trace = byproduct of processing
- *Deeper* processing produces more durable traces

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Levels of Processing Demonstration

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LEVELS OF PROCESSING.

Read each of the following questions and answer "yes" or "no" with respect to the word that follows.

1. Is the word in capital letters?	BOOK
2. Would the word fit the sentence: "I saw a _____ in a pond?"	duck
3. Does the word rhyme with BLUE?	safe
4. Would the word fit the sentence: "The girl walked down the _____?"	house
5. Does the word rhyme with FREIGHT?	WEIGHT
6. Is the word in small letters?	snow
7. Would the word fit the sentence: "The _____ was reading a book?"	STUDENT
8. Does the word rhyme with TYPE?	color
9. Is the word in capital letters?	flower
10. Would the word fit the sentence: "Last spring we saw a _____?"	robin
11. Does the word rhyme with SMALL?	HALL
12. Is the word in small letters?	TREE
13. Would the word fit the sentence: "My _____ is six feet tall?"	TEXTBOOK
14. Does the word rhyme with SAY?	day
15. Is the word in capital letters?	FOX

Now, without looking back over the words, try to remember as many of them as you can. Count the number correct for each of the three kinds of tasks: physical appearance, rhyming, and meaning.

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Maintenance Rehearsal versus
Elaborative Rehearsal

8

Research on LOP and Similar Themes

- Tulving (1975)
- Generation Effect (1978)
 - e.g. light d_ _ k (generation)
 - vs.
 - light dark (read)
- Faces - e.g. Sporer (1991)

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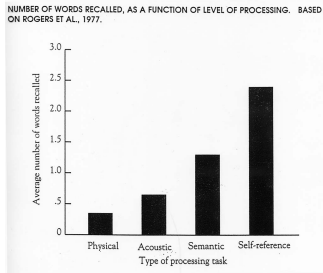
Self-Reference Effect

- Rogers, Kuiper, & Kirker (1997)
- Process list of words:
 - Physical characteristics
 - Acoustic characteristics
 - Semantic characteristics
 - Self - (reference)
- Robust effect
- Symons & Johnson (1997)
 - Meta-analysis
- Explanations

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Rogers, et. al., 1977



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Encoding Specificity Principle

- Importance of Context at Encoding & Retrieval
- Encoding Specificity Principle (ESP) --
Moscovitch & Craik (1975)

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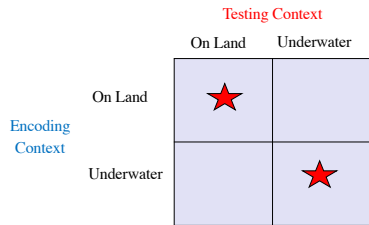
ESP Examples

- Godden & Baddeley – Scuba Diving Experiment (1975)
- Remembering names – using faces as contextual cues
- Imaginary contexts

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Godden & Baddeley (1975)



Half of the participants (deep-sea divers) learned the test material while underwater; half learned while on land. Then, within each group, half were tested while underwater; half were tested on land. Where do we expect a retrieval advantage?

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Learning Names using Faces as Cues

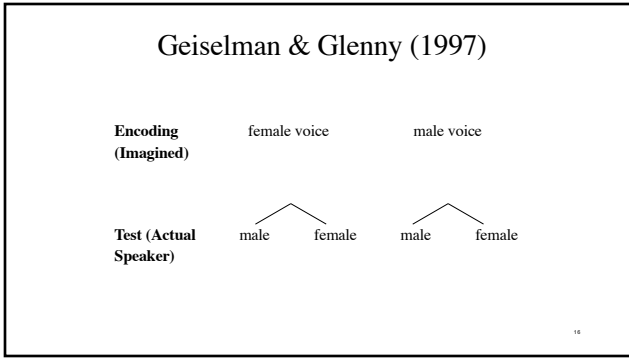


What's his name?

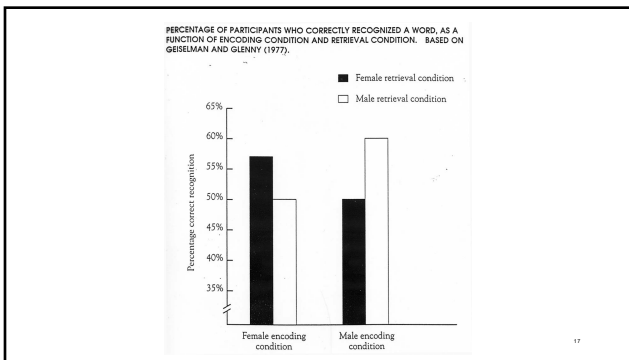
Tim!

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How can we use the
Encoding Specificity Principle
to improve memory for material?

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Explicit vs. Implicit Memory

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Study each of the words that appear

Picture	Custom
Commerce	Fellow
Motion	Advice
Village	Dozen
Vessel	Flower
Window	Kitchen
Number	Bookstore
Reindeer	

20

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Explicit Memory Measures

1. Recall: On the piece of scratch paper, write down as many of those words as you can recall.

2. Recognition: From the list below, circle the words that appeared on the original list:

woodpile fellow leaflet fitness number butter motion table
people dozen napkin picture kitchen bookstore cradle advice

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Implicit Memory Measures

1. Word completion: From the word fragments below, provide an appropriate, complete word. You may choose any word you wish.

v_s_e_l_t_e_v_l_l_a_e_p_a_s_t_i_c_m_o_t_i_o_m_n_u_a_n_t_b_o_o
c_m_e_c_a_v_c_t_b_e_f_o_e_c_r_o_h_m_w_r_b_o_s_o_e

2. Repetition priming: Perform the following tasks:

- Name three rooms in a typical house.
- Name three items associated with Christmas.
- Name three different kinds of stores.

Vessel, Letter, Village, Plastic, Motion, Manual, Notebook,
 Commerce, Advice, Tablet, Frozen, Carrot, Homework, Bookstore
 Number, Reindeer, Custom, Fellow, Dozen, Flower, Kitchen, Bookstore

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Explicit vs Implicit Measures of Memory

- Explicit memory measures:
 - recall
 - recognition
- Implicit memory measures:
 - Word fragment completion
 - Stem completion
 - Repetition priming
- Role of conscious, deliberate recollection

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The Critical Distinction

- Explicit memory tasks require conscious, deliberate recollection of previous experiences
- Implicit memory tasks do not require conscious recollection of previous events

e.g., b_ _ k

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Research with Amnesics

- Warrington & Weiskrantz (1970)
- Tasks
 - explicit - recognition, recall
 - implicit - mutilated word guessing
 - stem completion
 - e.g. st_ _ _
- Replicated
- Dissociation

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Dissociation

- A variable has an effect on one type of test, but little or no effect on another type of test
- A variable has one type of effect if measured by Test A, but a different effect if measured by Test B

		Exp	Impl
Parast	N	19	12
Am		0	12

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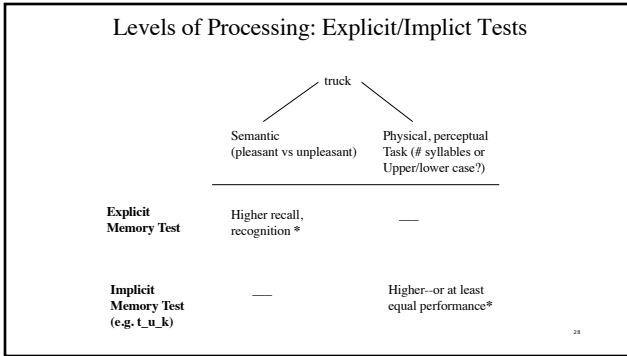
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Research with Normal Adults

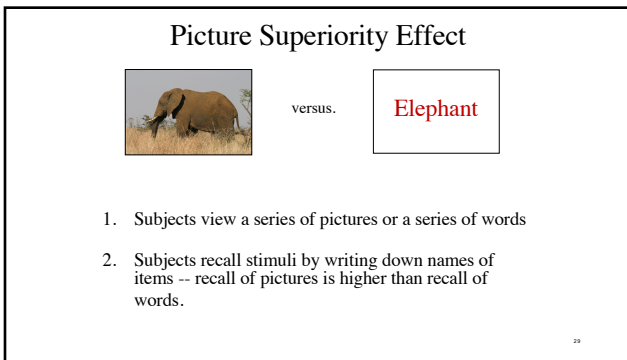
- Levels of processing and the implicit / explicit distinction
- Picture Superiority Effect
- Current Status
 - explanations
 - applications

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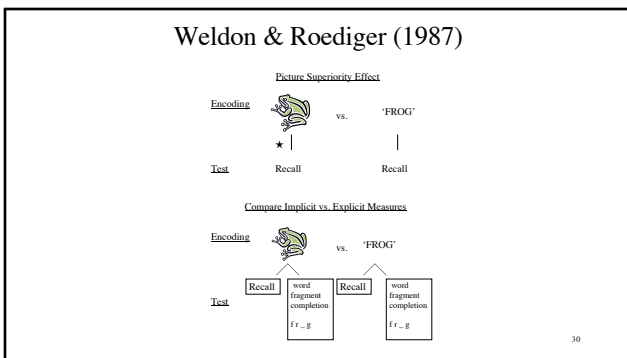
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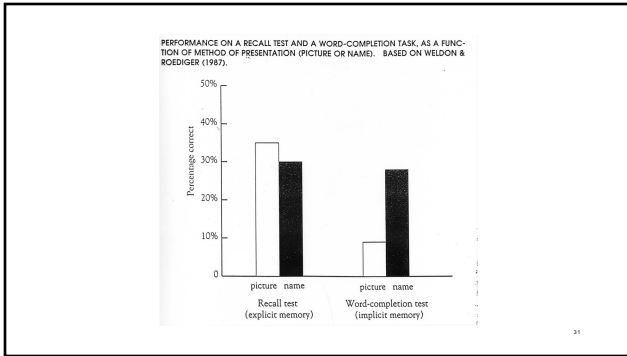
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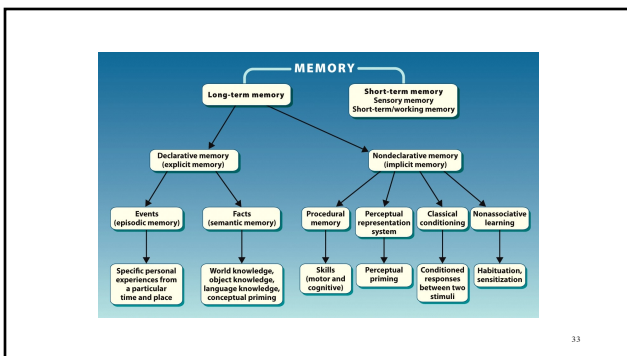
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- ### Explanations
- No agreed-upon explanation
 - Context & encoding specificity
 - Multiple memory systems
 - e.g. Tulving
 - Neuroscience account

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Applications of implicit / explicit
memory research to real life
problems?

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Ad for Experimental Psychologists

Experimental Psychologists

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Ulster Research has opportunities for both Graduate and Post Graduate (PhD level) scientists to join an exploratory consumer psychology research team leveraging the psychological measurement of attitudes and beliefs.

Graduate level roles are available in the Research Assistant and Internship positions. Roles involve supporting the team with data collection, analysis and reporting. Roles also involve supporting the team with data collection, analysis and reporting. Roles also involve supporting the team with data collection, analysis and reporting.

For more information contact Paul J. Dunne, Ulster Research Customer Experience, Belfast, LE4 1EQ, UK. E: p.j.dunne@ulster.ac.uk

Post Graduate level roles are available in the Research Assistant and Internship positions. Roles involve supporting the team with data collection, analysis and reporting. Roles also involve supporting the team with data collection, analysis and reporting.

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Consumer Science is a core, multidisciplinary centre that encompasses a wide range of consumer psychology research, including memory, memory recall, and attitude with a strong emphasis on the application of psychology to business.

We are a joint venture between Ulster and the Psychology Department, University of Limerick, together with the support of the UK's leading Psychology departments. Together we are pioneering a new approach to the study of Consumer Psychology which will develop an enhanced understanding of the consumer mind.

In 2019, we had a full CV and covering letter sent to prospective applicants by Paul Dunne, HR Officer, Ulster Research Postgraduate Centre, Belfast, LE4 1EQ, UK. E: p.dunne@ulster.ac.uk

Interviews will take place in our Post Graduate (Post) and Graduate (Graduate) Laboratories.

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Expertise

- Influence on LTM
- Definition - consistent superior performance
 - deliberate practice
 - at least 10 years
- Domain specific
- 10-year rule

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Context-Specific Nature of Expertise

- Skilled memory effect
- Chess
 - De Groot
 - Chase & Simon (1973):
 - 5 second task
 - typical vs. random positions
- Similar effects in many domains:
 - basketball
 - x-rays
 - circuit diagrams, etc.
- SF (digits only)

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An Expert Waiter - JC

- Ericsson (1985)
- J.C. - 20 tops
- Comparison of J.C. to college students
- Critical difference = memory strategies and knowledge
- Follow-up study (Crutcher, Ericsson, & Bauder)

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filet mignon
well-done
rice
thousand island



t-bone
rare
baked potato
blue cheese



sirloin
medium
rice
oil and vinegar

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JC' s Strategies

Temperature

Salad Dressings

thousand island → tbo
 blue cheese
 oil & vinegar

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1. Experts possess a well-organized, carefully learned knowledge structure. This may be stored in *long-term working memory*, which is a stable body of information that can be easily accessed via retrieval cues from "regular," short-term working memory.
2. Experts typically have more vivid visual images for the items they must recall. If you know more about clothing than football, you can visualize an epaulet better than a scrimmage.
3. Experts can rapidly access their knowledge, whereas novices require more time.
4. Experts are more likely to reorganize the material they must recall, forming meaningful chunks that group related material together. In contrast, those of us with no experience in remembering restaurant orders would be unlikely to regroup the customers' orders so that salad dressings were separate from side dishes.
5. Experts rehearse in a different fashion. For example, an actor may rehearse his or her lines by focusing on words that are likely to trigger recall.
6. Experts are better at reconstructing missing portions of information from material that is partially remembered.
7. Skilled at predicting the difficulty of a task and at monitoring their progress on a task
8. Work hard at encoding each item or stimulus so that it's *distinct*

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Autobiographical Memory

- Memory for events and issues related to yourself
- Naturally occurring events
- Continually growing interest
- Wide variety of topics
- High ecological validity

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Schemas

- Generalized, abstract knowledge structures
- Memory for common, ordinary events
- Variable instantiation
- False memories
- Consistency bias

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Source Monitoring

- Origin of a memory
- Johnson (1997, 2002); Pansky et al., (2005)
- Example: my idea or something I read or heard someone say
- Plagiarizing – e.g. of song melodies

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Flashbulb Memories

- Brown & Kulik (1977)
- High level of surprise
- High level of emotional arousal
- Recent Research (Weaver, 1993; Talarico & Rubin, 2003)

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Flashbulb Memories

- Memory for the circumstances in which you first learned about a very surprising and emotionally arousing event
- ▶ Many people believe that they can accurately recall all the minor details about what they were doing at the time of this event.
- ▶ In reality, people make numerous errors in recalling details of national events, even though they claim that their memories for these events are very vivid.

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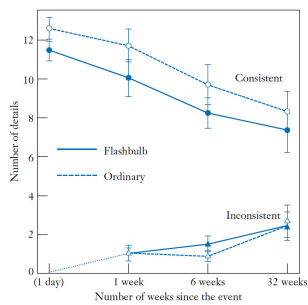
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Talarico & Rubin (2003)

- September 11, 2001 terrorist attacks vs. ordinary event
- Recall tested after 1, 6, or 32 weeks
- Consistent vs. Inconsistent Details
- Confidence

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Eyewitness Testimony

- The 'gentleman bandit' (1979)
- Identifying faces
 - Recognition accuracy
 - Time and attention
 - Reintz, et al. (1994, p 45)
 - Length of retention interval
 - Intervening info
- Misleading post-event info

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Misinformation Effect

- Caused by misleading information given after viewing an earlier event
- RI = retroactive inhibition or interference



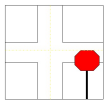
- Classic experiment - Loftus (1978)

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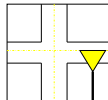
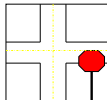
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Loftus (1978)

Study



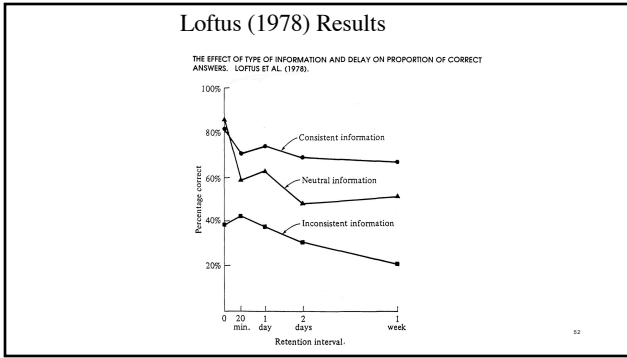
Slides at Test:



- Delay: 20 minutes to 1 week
- Question Answering
- Critical Question: consistent or inconsistent detail
- Test: Select 1 of 2 slides matching previously-viewed slide

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