


## Encoding specificity

PSY 200  
Greg Francis  
Lecture 17


*What to do if you are drunk while studying for an exam.*

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## Context

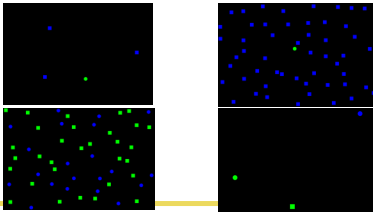
- The context within which you learn and recall can have a profound impact on your memory
  - e.g., part-set cueing
  - given part of a set that has been learned, subjects recall *fewer of the remaining items* than with normal free recall
  - Interference of recall
    - » Have to keep checking if an item you recall is already on the list
- Demonstration

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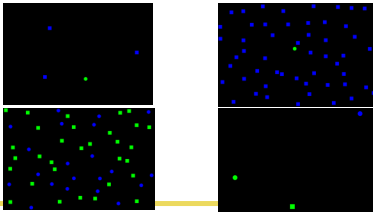
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## Context


- The effect of part-set cueing suggests that to measure memory you must consider the conditions at test
  - Memory is more often about *discrimination* of memory traces and not about the *strength* of memory traces
  - Similar to visual search experiments



Feature search




Conjunctive search

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## Context

- But memory is not exactly the same as visual search
- Information must be encoded in memory as well as recalled
  - Such encoding can alter what features are stored as part of the memory
  - Which changes the discrimination of subsequent recall
- It turns out, that to maximize recallability
  - the effort and conditions at the time of learning must be consistent with the properties and conditions of the test
- *Encoding specificity principle*

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## Representative study

- Subjects in two groups
  - see the same words, but have different tasks
  - This changes the *encoding* of information in memory

Semantic judgement


CHEESE


The man threw the ball to the \_\_\_\_\_.

Rhyme judgement

CHEESE

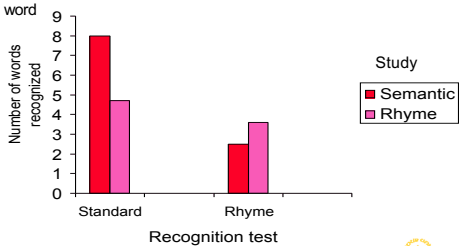
SNEEZE

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## Test

- Each group is then split into two subgroups that vary in the *recall* of information
  - 1) Normal recognition task
  - 2) Shown a word and asked if any of the target words rhymed with this word




Recognition test	Semantic	Rhyme
Standard	8	4
Rhyme	2	3

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### Significance

- It is not that one learning strategy is better than the other
  - or that one testing strategy is better than the other
- Encoding (learning) of information and recall of information need to match
- This means it is very difficult to test for absolute memory
  - subject's performance depends on *many* factors

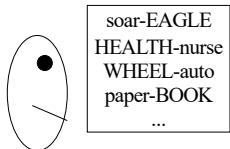
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### Encoding specificity


- Memory is better when the cues available during recall match the cues available during encoding
  - Tulving & Osler (1968)

Cue



No cue



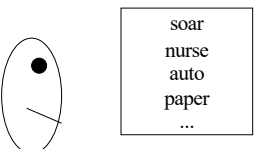
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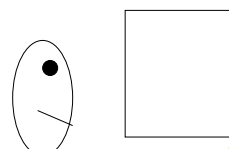
### Encoding specificity


- Each group split into two groups for testing recall
  - cue is *always* related to target word

Cue



No cue

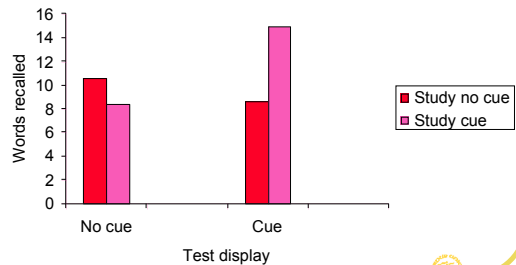


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### Encoding specificity

- Results
  - cue does not always help



Test display	Study no cue	Study cue
No cue	~11	~8
Cue	~9	~15

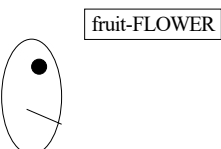
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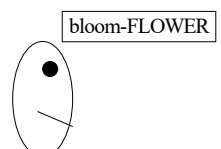
### Encoding specificity


- CogLab has a variation of this experiment
- Instead of cue-no cue, we used strong or weak cue (48 word pairs to study)

Weak cue



Strong cue




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### Encoding specificity

- Class results (170 participants)
  - Best recall when test with same cue as at study



Study Cue	Test Cue: Weak	Test Cue: Strong	Lure
Weak	~0.68	~0.6	-
Strong	~0.5	~0.7	-
Lure	-	-	~0.8


"Lure" is a word that was not studied

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### Surrounding context

- Deep-sea divers learn words (Godden & Baddeley, 1975), either
  - ♦ on land (dry)
  - ♦ under water (wet)



EAGLE  
HEALTH  
WHEEL  
BOOK  
...



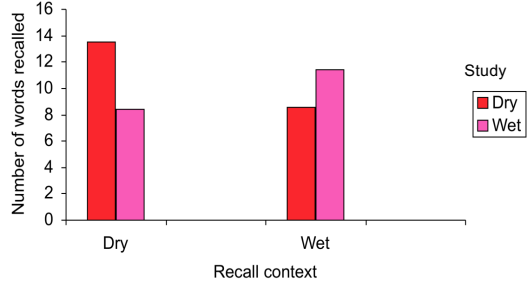
EAGLE  
HEALTH  
WHEEL  
BOOK

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### Surrounding context

- Test for recall on land (dry) or under water (wet)



Recall context	Dry (Study)	Wet (Study)
Dry	~13.5	~8.5
Wet	~8.5	~11.5

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### Significance

- Decompression tables for divers
  - ♦ want to remember when under water
  - ♦ generally study while on land
- Researchers working under water have difficulty recalling their details on land
  - ♦ E.g., counts of species
- How do you know if something is forgotten?
  - ♦ changing context may allow subject to recall seemingly forgotten information
  - ♦ forgetting = retrieval problem?

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### Forgetting


- Forgetting is not always a characteristic of a memory system, or your brain
  - ♦ although it could be in some cases, it is not always
- Forgetting *must* be defined operationally
  - ♦ specify the task and context of retrieval
  - ♦ You can never be certain that if you are placed in a different context you will still show forgetting

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### Internal context

- Goodwin et al. (1969)
- Subjects drink 10 oz. 80 proof vodka, mixed in sugar-free lemon-lime drink
  - ♦ or a similar tasting drink (bit of vodka on top of drink)
- Test memory 24 hours later
- Subjects are either:
  - ♦ Sober at study, sober at test
  - ♦ Drunk at study, sober at test
  - ♦ Sober at study, drunk at test
  - ♦ Drunk at study, drunk at test

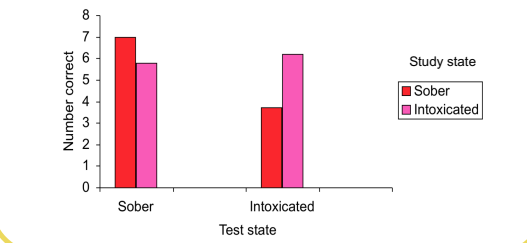


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### Internal context

- Best recall if study and test states are the same
  - ♦ Similar effects for marijuana cigarettes (Eich et al., 1975)




Test state	Sober (Study state)	Intoxicated (Study state)
Sober	~7.5	~5.5
Intoxicated	~3.5	~6.5

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### Testing


- So, if you are intoxicated while studying for an exam
  - ♦ and you didn't study before
- You should be intoxicated while taking the exam

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### Mood

- Mood has a similar effect (Eich et al, 1994)
  - ♦ Mood induced by music and directed thoughts





Test mood	Happy Study mood	Sad Study mood
Sad	~23%	~33%
Happy	~35%	~28%


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### Classrooms

- Is memory better when you are tested in the same room as lectured?
  - ♦ significant for final exams!
- Smith et al. (1978)
  - ♦ Subject studied words in one of two contexts (on separate days)
  - ♦ Varied classroom and dress of experimenter

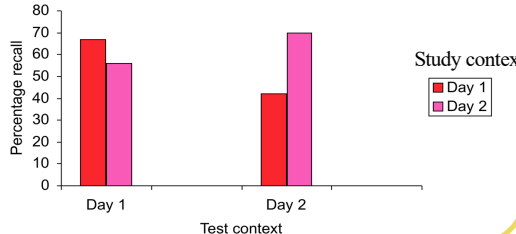



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### Classrooms

- Subjects recall all words either in the context of Day 1 or Day 2 (different contexts for different subjects)
- Recall was best for words that were studied in the test context




Test context	Day 1 Study context	Day 2 Study context
Day 1	~68%	~55%
Day 2	~42%	~70%

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### Conclusions


- Context
- Encoding specificity
  - ♦ memory best if study and test are similar
- Cues
- Environment
- State
- Mood
- Classrooms

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### Next time

- Discrimination in memory
- Proactive interference (PI)
- Release from PI
- CogLab on False memory due!
- *How to take a test.*

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