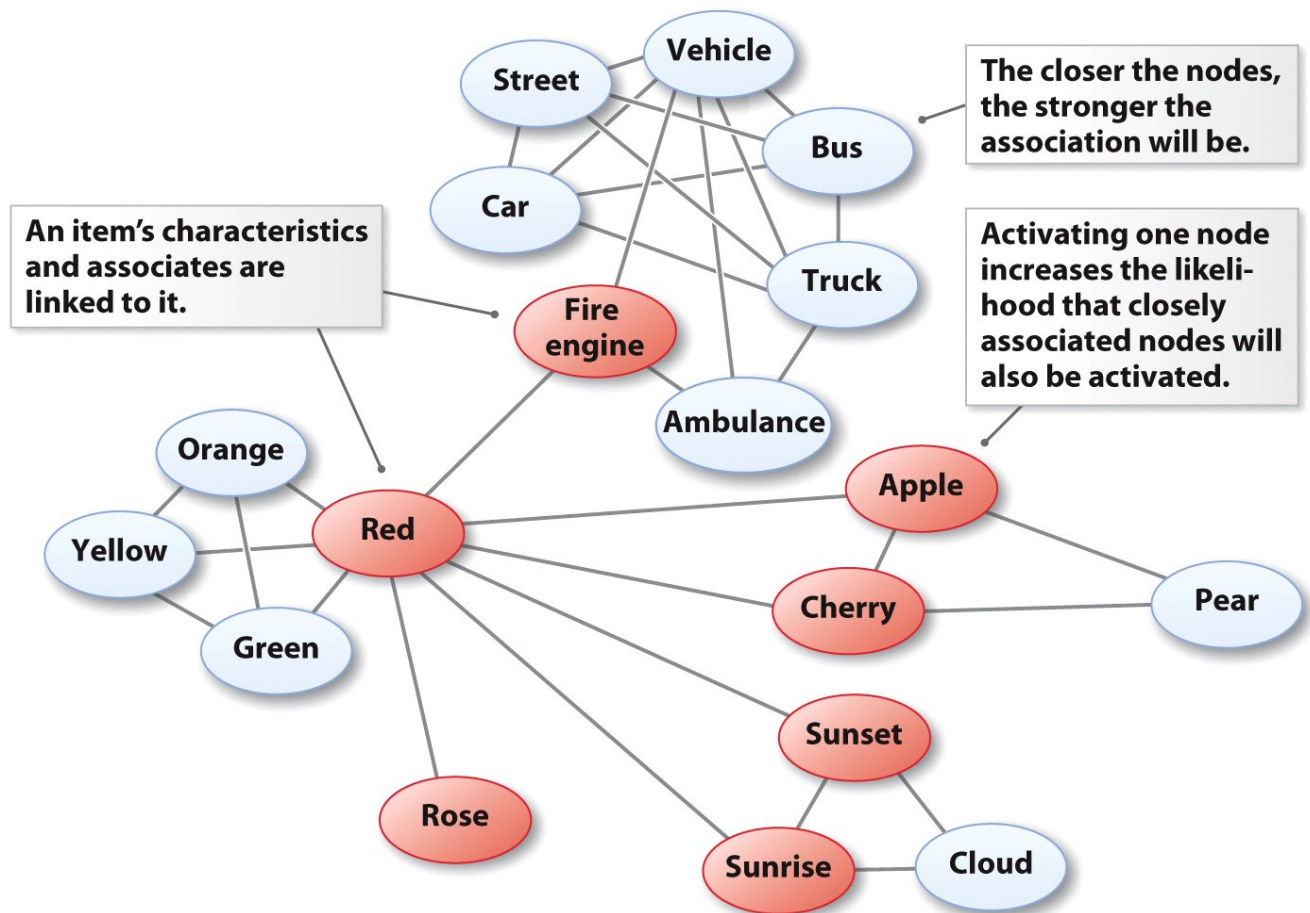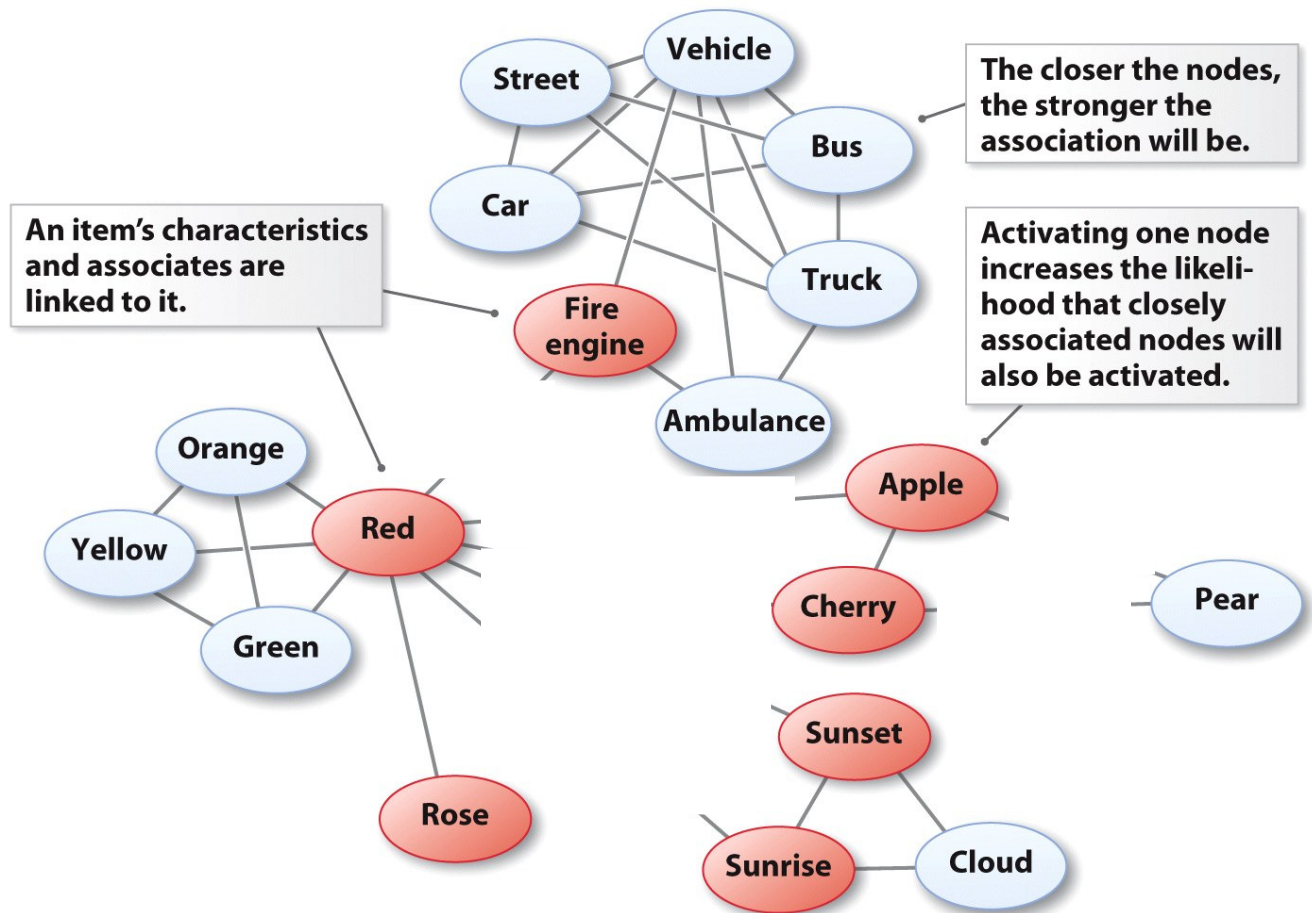# Storage: Association Networks

Association networks: A model that describes units of information in long term memory as being organized in a complex network of associations. Notice the relation to elaborative rehearsal.

The closer the nodes, the stronger the association will be.

An item's characteristics and associates are linked to it.

Activating one node increases the likelihood that closely associated nodes will also be activated.

Psychological Science, 4/e Figure 7.17
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Broken Associations Make Retrieval Difficult

Vehicle

Street

Bus

The closer the nodes, the stronger the association will be.

Car

An item's characteristics and associates are linked to it.

Truck

Fire engine

Activating one node increases the likelihood that closely associated nodes will also be activated.

Ambulance

Orange

Apple

Yellow

Red

Cherry

Pear

Green

Sunset

Rose

Sunrise

Cloud

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Schemas and Encoding

Schemas: Cognitive structures that help us perceive, organize, process and use information (page 280).

In the following example, a schema helps organize the seemingly random and obscure statements.

Instructions: Take a minute to read through this paragraph. After a minute, try to recall as much information about the paragraph as you can. Do the best you can, exact word for word recall is not required as long as it is close.

The procedure is actually quite simple. First arrange things into different groups. Of course, one pile may be sufficient depending on how much there is to do. If you have to go somewhere else due to lack of facilities that is the next step, otherwise you are pretty well set. It is important not to overdo things. That is, it is better to do too few things at once than too many. In the short run this may not seem important but complications can easily arise. A mistake can be expensive as well. At first, the whole procedure will seem complicated. Soon, however, it will become just another facet of life. It is difficult to foresee any end of the necessity for this task in the immediate future, but then one never can tell. After the procedure is completed one arranges the materials into different groups again. They can be put into their appropriate places. Eventually they will be used once more and the whole cycle will eventually have to be repeated. However, that is part of life.

In this example, activating the schema of sleep, hindered memory, and generated a memory of something that wasn't present, but logically should be there. This process occurs <u>unconsciously</u> and <u>automatically</u>.

Since it occurs unconsciously and automatically, they are hard to prevent and control. This also means we make judgments and decisions on processes we may or may not be aware of.
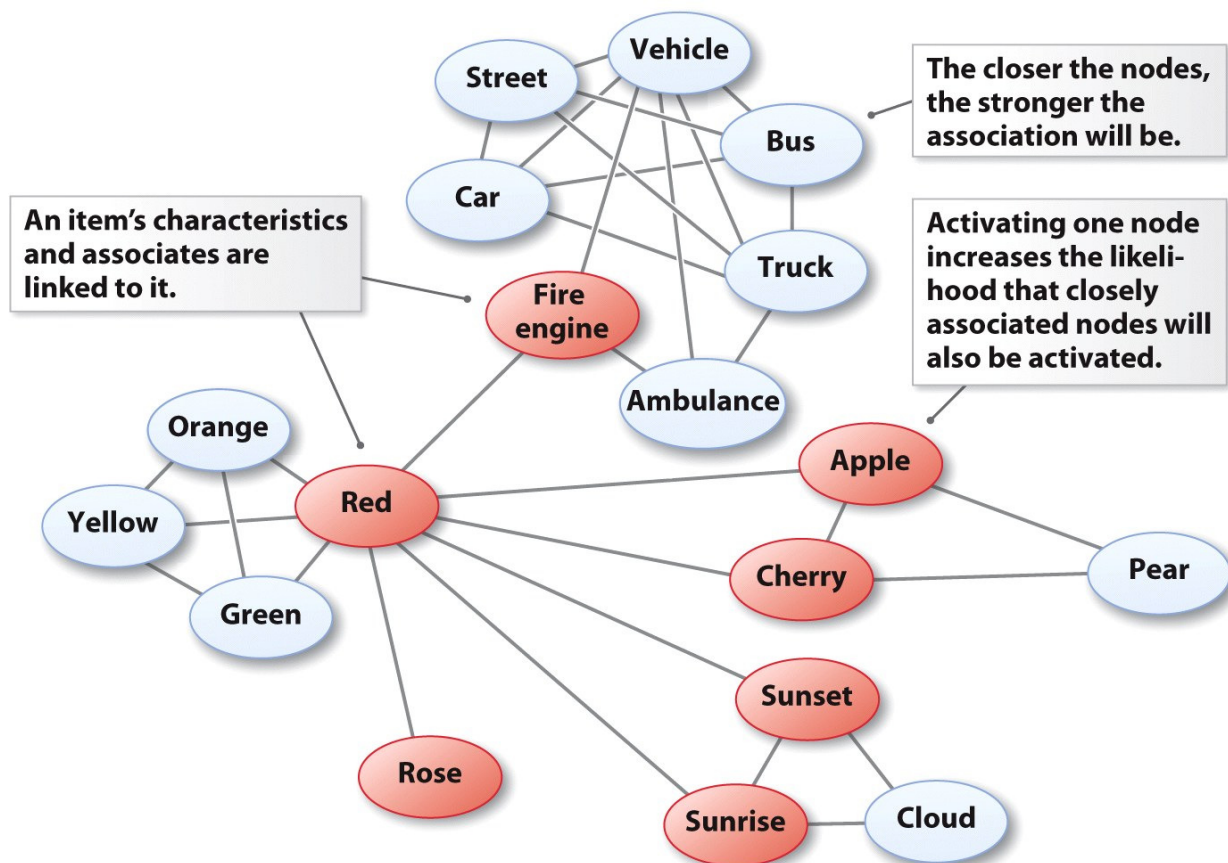

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Table 5.2	False Recognition
Sour	Thread
Candy	Pin
Sugar	Eye
Bitter	Sewing
Good	Sharp
Taste	Point
Tooth	Prick
Nice	Thimble
Honey	Haystack
Soda	Pain
Chocolate	Hurt
Heart	Injection
Cake	Syringe
Tart	Cloth
Pie	Knitting

Sweet and needle are the targets

Schemas and Memory

In this demonstration, participants were asked to wait in this office for the study on memory to begin.

Afterwards, they were brought to another room and asked to recall as many objects as they could remember in the office they were waiting in.

Memory Distortions and Schemas

What participants recalled about the office:

Correct recollections by participants:
- Chair
- Bookcase
- Desk
- Typewriter

Incorrect recollections by participants:
- Books
- Telephone
- Filing cabinets
- Pens and pencils
- Coffee cups

Items typically found in an office

Items not recalled by participants:
- Coffee pot
- Wine bottle
- Picnic basket

Items typically not found in an office

How do psychologists explain these errors in memory recall?

Most people do not pay attention to the details and encode the content of the office because it is not very important for their daily life. A majority of the contents of office entered sensory memory, but was not encoded (*encoding failure*) into *short-term memory* and quickly forgotten.

Schemas

A <u>schema</u> is an organized cluster of information about a particular topic.
- Information consistent with an office schema would include telephone, books, lamp, etc.
- Information inconsistent with an "office schema" would include candles, cars, submarines, etc.

To help "remember" the contents of the office, people activated an "office schema" and inferred items that are typically in an office. This means:
- Remembering things that are typically in an office (regardless if they were in there or not).
- Not remembering and forgetting things that were in the office but not in a "typical office".

"Sensory memory"	"Short-term memory"	"Long-term memory"
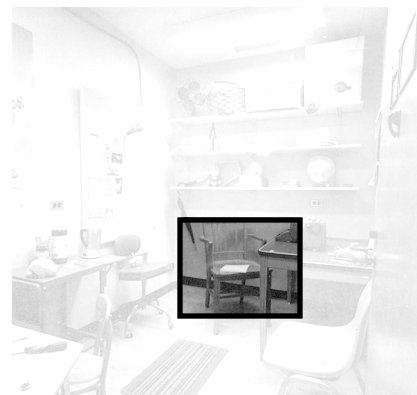
You can generalize how schemas affect memory by the following:

- We tend to remember things that are consistent with a schema.
- We tend to forget things that are inconsistent with our schema.

Regarding studying, when you learn something new and different that is inconsistent with prior beliefs, you need to try extra hard to remember and encode it.

Schemas and Conservation (Piaget)

People have a difficult time believing that 3rd world countries have an easier time overcoming the conservation problem than Americans.

1 A young child believes that a tall 8 oz. glass contains more juice than a short 8 oz. glass.

2 Here, the child watches the juice being poured from the tall glass into a second short glass.

3 She is surprised to see that the short glass holds the same amount of juice as the tall glass.

Retrieval: Accessing Information

Recall: A test of long-term memory that involves retrieving information without the aid of retrieval cues. This is sometimes called free recall. Recall involves a two-step process:
1. the generation of possible targets, and
2. the identification of genuine ones.
   - Name the Seven Dwarves.
   - Name Oregon's two senators in the United States Congress.

Cued recall: A test of long-term memory that involves remembering an item of information in response to a <u>retrieval cue</u>.

<u>Retrieval cue:</u> A clue, prompt, or hint that helps trigger recall of a given piece of information stored in long-term memory.
   - Name the Seven Dwarves. Hint: One was always smiling, one was smart, one never talked, one seemed always to have a cold…

Having multiple cues increase the likelihood that you will recall what you are looking for. Why?

Recognition: A test of long-term memory that involves identifying correct information out of several possible choices. Unlike recall, the generation of possible targets is already done.
   - Which of the following were among the Seven Dwarves: Sneezy, Sleazy, Dopey, Dippy, Hippy, Happy…?

4th Edition, Kalat, J. (1996)

Retrieval: Encoding Specificity Principle

Matched of Learning/Retrieving environment (# #)			
Learned Underwater →	**Retrieved underwater**	**Learned on the Beach** →	**Retrieved on the beach**

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Mismatch of Learning/Retrieving environment (# !)			
Learned Underwater →	Retrieved on the beach	Learned on the Beach →	**Retrieved underwater**

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Percentage of
words recalled

40%

Greater recall when
learning and testing
contexts were the same

30

20

10

0

Water/land   Land/water   Water/water   Land/land

Different contexts
for hearing
and recall

Same contexts
for hearing
and recall

Alexis Rosenfeld/Science Source

Retrieval: Encoding Specificity Principle

context effects	The tendency to information to be retrieved easier when the retrieval occurs in the same setting or environment as the original learning of the information. • I cannot recall my voice-mail number until I get to the phone. • Wolverine couldn't remember his past until he returned to the "secret lab" • Or remember your name outside of class
state-dependent learning	The tendency to remember information when the physiological state matches the physiological state in which it was learned. • If you learned information while using drugs, being tired, etc., it is more likely that you will recall that information while in the same state (ie. drugged state, tired, etc.). However, drugs impair your ability to learn, so taking drugs does not facilitate learning.
mood congruence	The tendency for a given mood to evoke memories that is consistent with that mood. • Happy memories are easier to retrieve when in a happy mood. • Sad memories are more likely to be retrieved than happy ones when in a sad mood.

A Recall Test

A Test for Recall

Close your eyes and try to *recall* the names of Santa's nine reindeer. Most people can only recall four to five names. Now turn to page 281 for a *recognition* test on the same material.
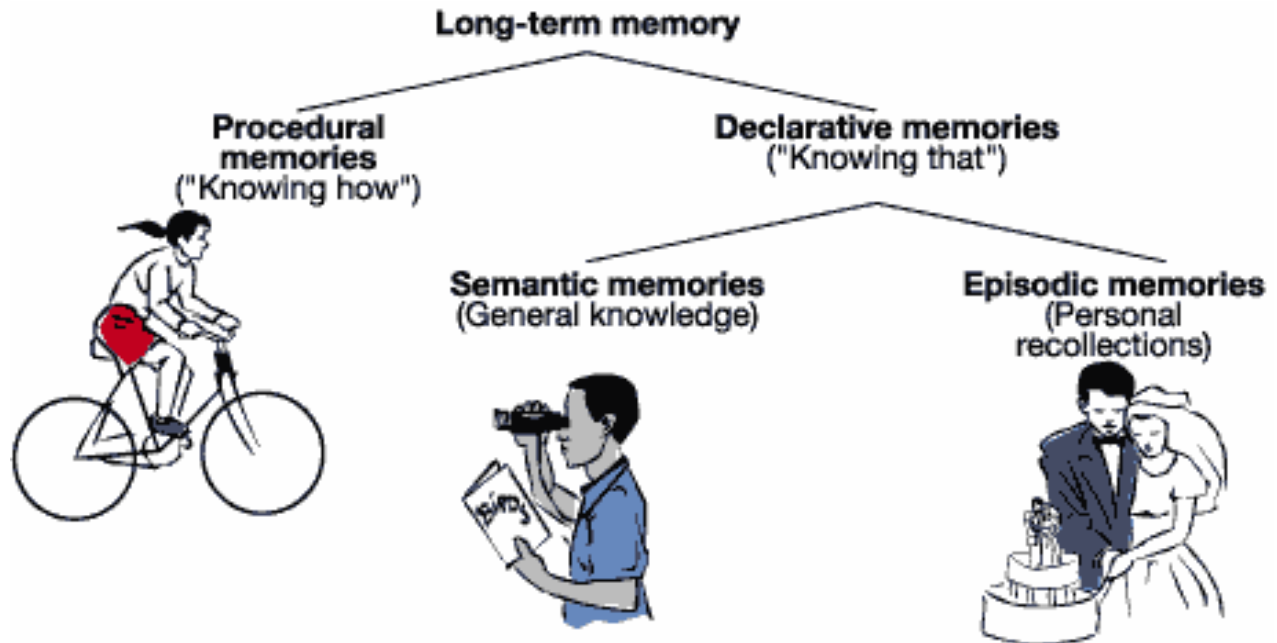
Michel Tcherevkoff Ltd. /The Image Bank/GettyImages

A Recognition Test

Of the following names, which are the names of Santa's nine reindeer?

Rudolph,   Dancer,   Cupid,   Lancer,

Comet,   Blitzen,   Crasher,   Donder,

Prancer,   Dasher,   Vixen

Multiple Forms of Memories

Long-term memory

Procedural memories ("Knowing how")   Declarative memories ("Knowing that")

Semantic memories (General knowledge)   Episodic memories (Personal recollections)

Procedural Memory	Semantic Memory	Episodic Memory
Information that is usually difficult to recollect such as <u>how to perform</u> different skills, operations and actions.	Information that can be consciously recollected. This takes the form of <u>general knowledge</u> such as facts, names, and concepts.	Information that can be consciously recollected about <u>personally experienced</u> events.
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Implicit memories	**Explicit Memories**	