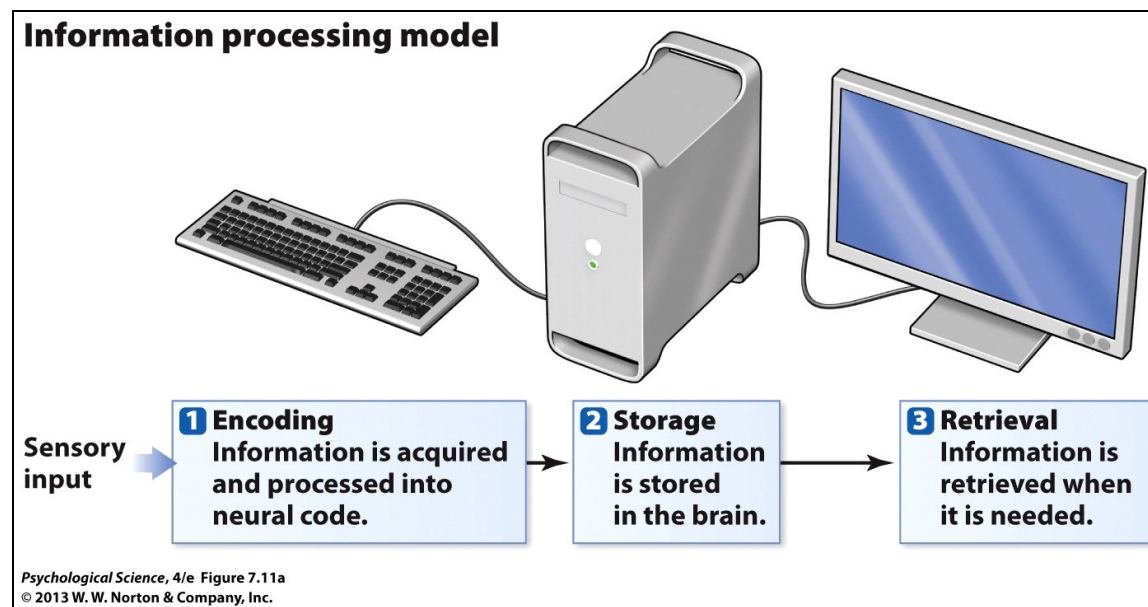


Memory

Memory is the mental processes that enable us to retain and use information over time that involve three fundamental processes: encoding, storage and retrieval.



- Encoding: The processing of information so that it can be stored (page 269).
- Storage: The retention of encoded representations over time (page 269).
- Retrieval: The act of recalling or remembering stored information when it is needed (page 270).

Forgetting

Reasons why we forget things may not have anything to do with “a bad memory”, but normal memory processes such as the following:

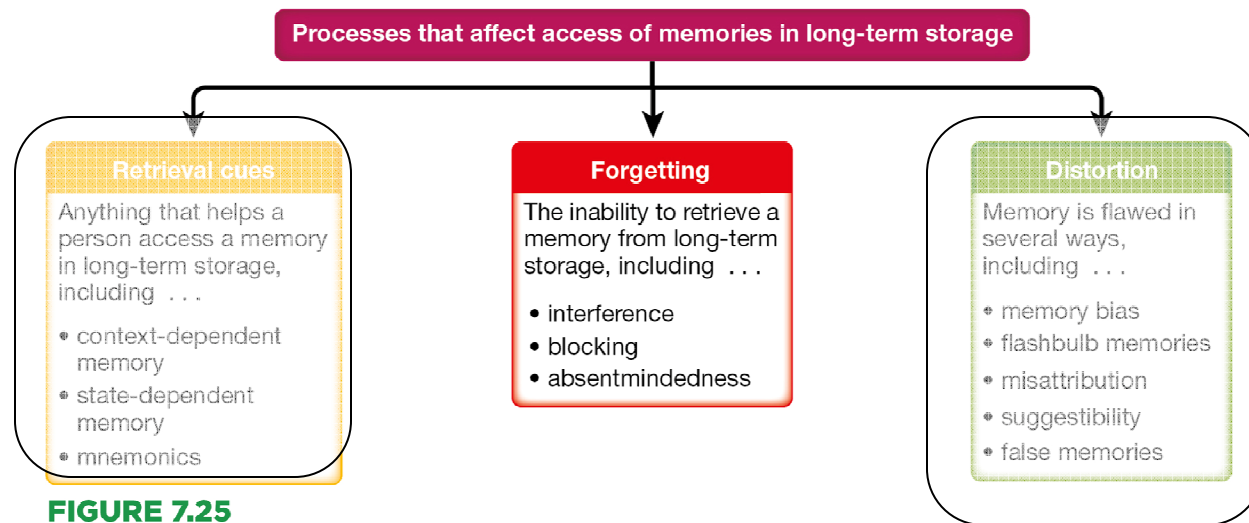
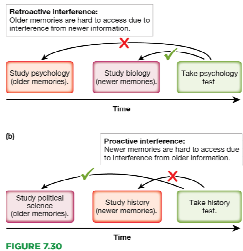


FIGURE 7.25

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- Encoding failure (see previous lecture/section 7.6)
- Decay of Memories (see Forgetting Curve, figure 7.29)
- Interference
- Blocking
- Absentmindedness

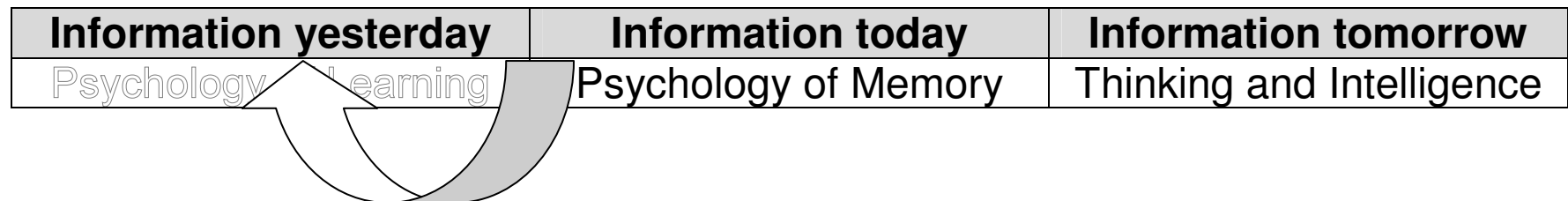
- Sleep deprivation (not included in this chapter)



Interference

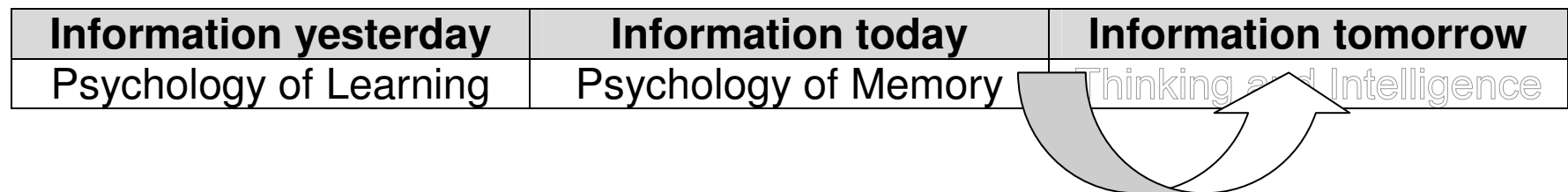
Forgetting can be caused by one memory competing with or replacing another. The details of our memories fade as time passes. As our lives move forward, new memories can interfere with old ones.

- **Retroactive Interference:** A type of interference in recalling memories that occurs when access to older memories is impaired by new memories (page 291). Sometimes called backward acting interference.



Or our memories are so strong that it interferes with our ability to form new ones.

- **Proactive Interference:** A type of interference in recalling memories that occur when access to newer memories is impaired by older memories (page 293). It is sometimes called forward acting interference.



Proactive or Retroactive Interference?

Jennifer Lopez recently married Ben Affleck, and taken his last name. Most of us will still call her Jennifer Lopez.

Is this proactive or retroactive interference?

Information yesterday	Information today

Why would learning about interference important in explaining this error?

Proactive or Retroactive Interference?

Season 1	
Season 2	Skye, Jemma, Leo, Phil, Melinda, Ward
Season 3	Skye (Daisy is her real name), Jemma, Leo, Phil, Melinda, Ward
Season 4	Daisy, Jemma, Leo, Phil, Melinda, Ward

In Season 1 and 2, the name of the character on the left is Skye. In Season 3, she finds out that her real name is Daisy.

In Season 3, Phil keeps on calling Skye, Skye and not what she wants to be called, Daisy.

Proactive or Retroactive Interference?

At Dairy Queen, apparently, when you serve the Blizzard, you turn it upside down to show how thick it is.



One employee, who worked at Dairy Queen, started a different job and a different restaurant. Due to their training, they reflexively turned a drink upside down and got all over the place (<https://www.intheknow.com/post/former-dairy-queen-employee-forgets-she-no-longer-works-at-dairy-queen-and-spills-soda-everywhere/>).

Is this proactive or retroactive interference?

Blocking

Blocking is the temporary inability to remember something ([page 292](#)).

A common example of this is the tip-of-the-tongue experience (TOT) where you feel that you are on the verge of recalling information.

Blocking often occurs because of some interference for words that are similar in some way, such as in sound or meaning. People often confuse the members of the television show Munsters and the Addams Family.



Absentmindedness (divided attention)

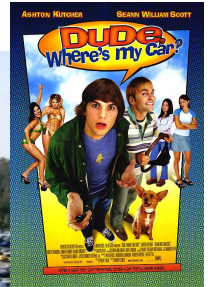
The inattentive or shallow encoding of events ([page 292](#)).

Attention plays a key role in encoding information into long term memory. If you divide your attention between multiple tasks, you are less likely to recall information (see encoding failure) from one of the tasks and less likely to notice subtle changes.



FIGURE 7.31

AP Photo/Robert E. Kian
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How Does Attention Determine What We Remember?

Many students say they have trouble remembering the material covered in class and in their textbooks. Their problems may not be their memory, but with a divided attention.

In one study, research participants pressed a button when two people played a game when a person slapped the other person's hands (**panel a**). Next, the participants pressed a button when the ball was passed to another person (**panel b**). They did each of these tasks easily.

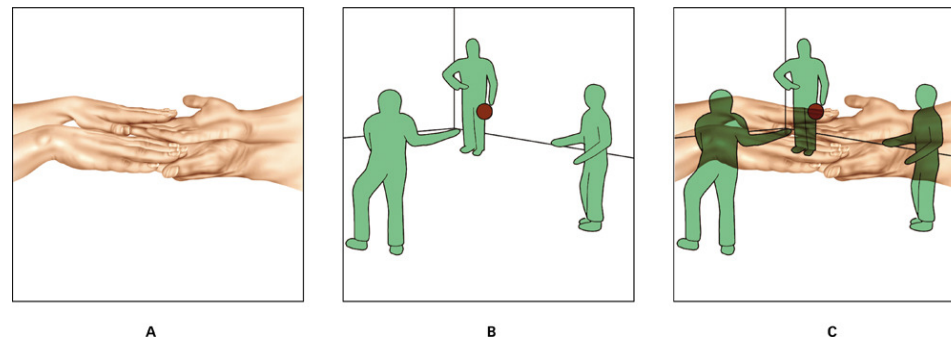


Image source: Schacter et. al.

Easy

Easy

Both A & B
Difficult

However, when they did these tasks simultaneously, their error rate was eight times greater while “multi-tasking”

Attention

Attention is difficult to divide. When attention is divided, your ability to do each task effectively is greatly reduced. You might miss something subtle or unexpected. When multitasking, you are actually switching between multiple tasks and not doing them at the same time.

Implications

- Don't be an engineer of a train and text.
- Don't text, talk on phone while driving.

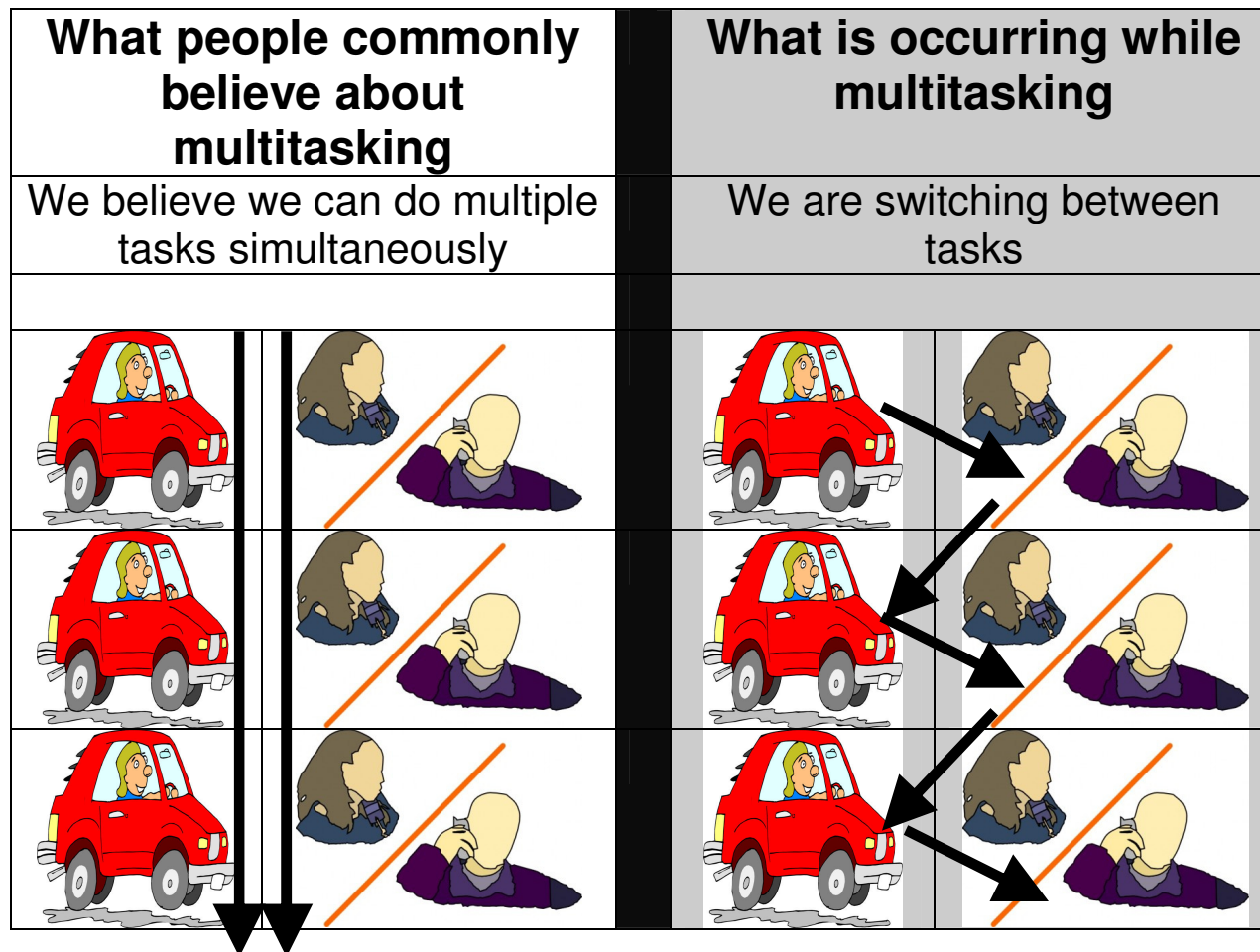


Image source: NPR

- Don't text, talk on phone while in class or a meeting, you can miss something subtle.
- Don't study while watching TV or any other task. (Some people can study with the TV on as background noise, but they aren't watching it).

What is the Psychology of Multitasking?

When multitasking, you are switching between tasks. You really aren't doing two things simultaneously.



What is Psychologically Occurring While Multitasking

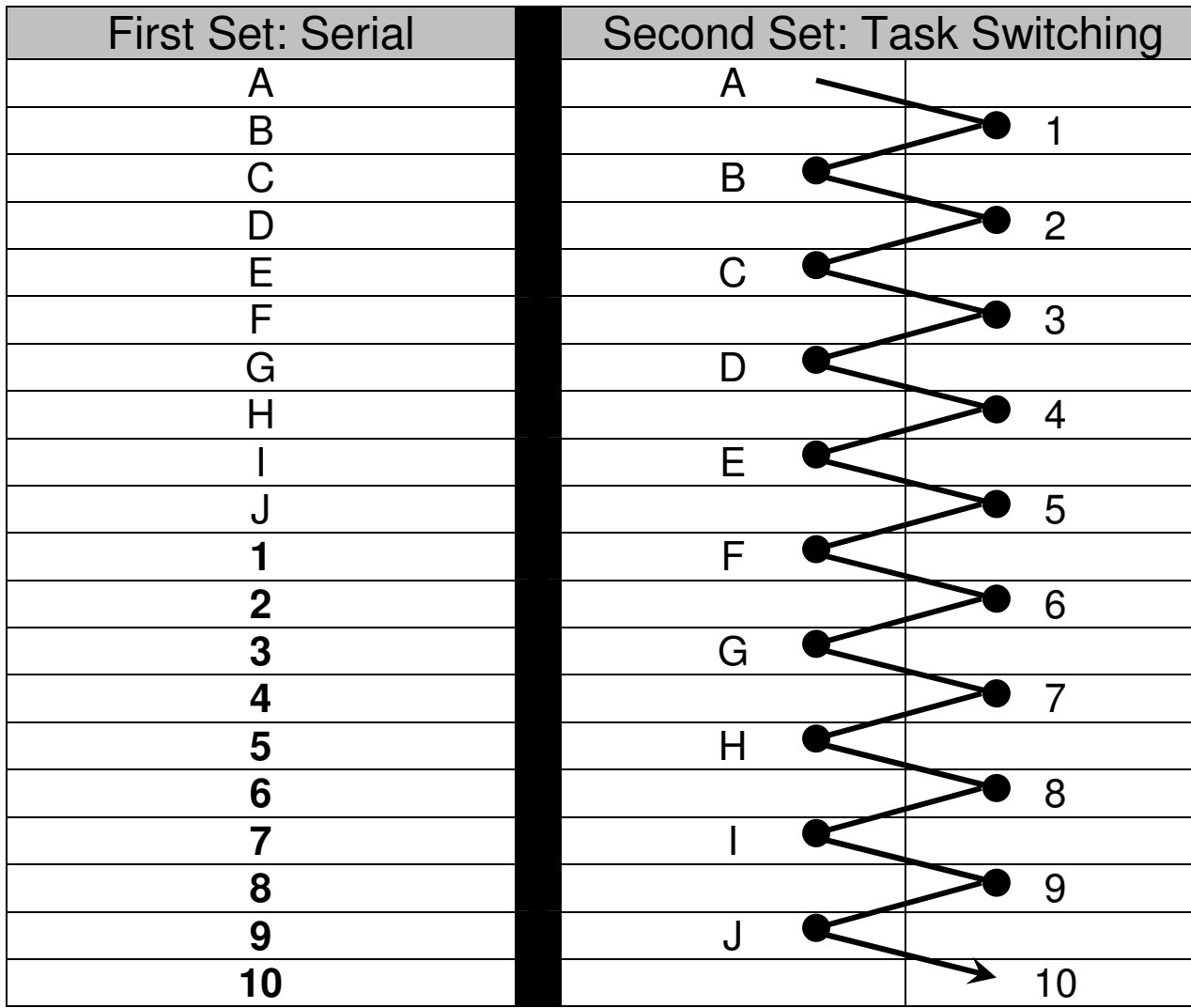
It takes your brain some time to switch between two tasks.

As a simple demonstration of the loss of efficiency of multitasking,

- Recite the letters A through J as fast as possible
- Recite the numbers 1 through 10 as fast as possible

Next, interweave these two tasks as fast as you can

- A, 1, B, 2, C, 3...



Task Switching

- (1) Ask your partner their first name
- (2) Have them perform the task switching task (A, 1, B, 2, etc.) without visually reading it.
- (3) When they are 25%-75% done, ask them one of the following questions
 - (a) What is your last name?
 - (b) What is today's date?
 - (c) What is your next class?
 - (d) What was the last thing you ate?
- (4) Have them continue where they left off.

Task Switching

- (1) Ask your partner their first name
- (2) Have them perform the task switching task (A, 1, B, 2, etc.) without visually reading it.
- (3) When they are 25%-75% done, ask them one of the following questions
 - (a) What is the color of your shirt?
 - (b) What time does class start?
 - (c) What is day of the week is it?
 - (d) What was the last thing you drank?
- (4) Have them continue where they left off.

Examples of Multitasking

You are switching between

- Driving while on the cell phone.
- Walking while texting.
- Calculating a bill and talking to a customer.
- Having a conversation with your partner and surfing the internet.
- Grading papers while watching The Daily Show.

Potential consequences of multitasking



What is found about multitasking?

Heavy media multitaskers compared to low media multitaskers are found to have (Ophir, Nass and Wagner, 2009):

1. more difficulties in ignoring irrelevant and distracting information (which may be important for problem solving, expertise and metacognition) and focus on relevant information.
 - Multitasking reduces “analytical thinking” You are less likely to effectively evaluate information
 - The reduction in attention from multitasking reduces your ability to elaborate on what you are learning. Elaboration is important for encoding and retrieval of information.
 - Multitasking reduces the ability to detection subtle changes and nuances [see Mentalist clip].
2. more errors with working memory (familiar items interfered with memory retention)
3. spent more time switching between different task
 - When switching tasks, it is difficult to remember where you were, what you are doing and where you are going. Some of this contextual information is lost when you are multitasking and lead to more errors and less efficiency. [Yeung, 2009]



Sleep and Memory

REM sleep (short periods in which we dream) is thought to restore mental and brain functions.

- Both animal and human studies have shown that REM sleep increases after learning a novel task and
- deprivation of REM sleep following training disrupts learning when compared to those who are not deprived of REM sleep.

Being deprived of sleep can impair your ability to form new long-term memories

Why is it important to know about the relation between sleep and memory?