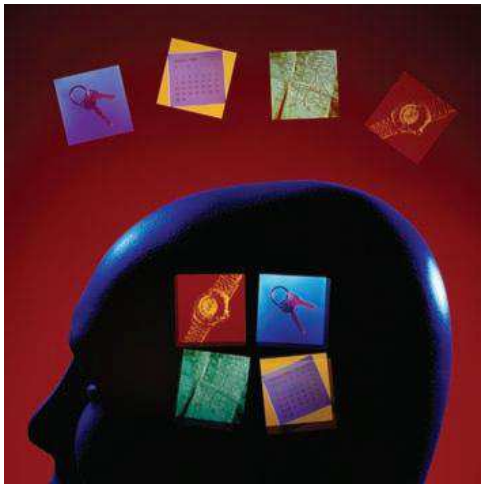
A Black Flag ad shows two glass tanks filled with cockroaches. One tank is sprayed with Black Flag, and most of the cockroaches die. The other tank is sprayed with another leading brand, but few cockroaches die. What consumers are not told is that the cockroaches in the second tank are bred to be resistant to the other leading brand of insecticide.

Misleading advertising practices are unfair because consumers must form inferences and make assumptions to comprehend advertising claims. Sometimes the Federal Trade Commission (FTC) orders advertisers to air **corrective advertising** that states that a previous ad was misleading, as in the famous Listerine case. A Listerine ad stated that Listerine kills germs that cause colds, which simply was not true. Listerine's corrective ad stated that Listerine does not help prevent colds. Nevertheless, extensive research has shown that corrective advertising is typically ineffective[15] because consumers have difficulty changing their beliefs dramatically, even when they realize that those beliefs are wrong.[16]

Memory

Memory researchers often use a computer metaphor to explain how memory works.[17] A computer has a hard drive that can store a large number of inactive files. A computer also allows users to retrieve a file from the hard drive and bring it into active memory so the file can be processed (e.g., edited or used). Similarly, people have a long-term memory system that stores a large amount of inactive data or knowledge. To use such knowledge, however, people must retrieve a "file" from long-term memory and bring in into short-term memory to process it further. All thinking and reasoning occurs in short-term memory, but only a small amount of information can be held in short-term memory at any given time (7 plus-or-minus 2 chunks or units). If this information is not used, it is lost less than 18 seconds later (hence, the name "short-term memory"). By contrast, long-term memory appears to store an unlimited amount of information for a long period of time. Nevertheless, three different types of forgetting can occur in long-term memory: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1. Original information is not maintained
2. New information is not successfully stored in memory
3. New knowledge overrides existing information, or vice-versa

Information held in long-term memory can also be distorted or changed over time. Furthermore, sometimes consumers can't forget things that they'd prefer to forget. We discuss how consumers forget information in the next section.

OBJECTIVE 4

The Seven Sins of Memory

Although memory influences nearly every thought and action we take, memory can also be fallible. There are seven basic mistakes or "sins" of memory: transience, absent-mindedness, blocking, misattribution, suggestibility, bias, and persistence.[18] The first three sins refer to three different types of forgetting. The second three refer to three different types of distortion. Persistence refers to the inability to forget things one wants to forget.

TRANSIENCE **Transience** refers to forgetting over time. If you don't use it, you lose it: If knowledge is not used for a long period of time, information loss can occur. Recently processed information is more **accessible** or easy to retrieve, relative to information that was processed long ago. Information accessibility decreases with the passage of time. Hence, it is easier to remember commercials we viewed recently than to remember commercials we viewed long ago. However, the passage of time is not the only variable that influences forgetting. Forgetting can also occur as a result of shallow processing (absent-mindedness) or interference from other information stored in memory (blocking).

ABSENT-MINDEDNESS **Absent-mindedness** refers to forgetting as a result of shallow or superficial processing of information during encoding or retrieval. **Encoding** refers to attention, comprehension, and the transference of information from short-term memory to long-term memory. **Retrieval** refers to the transference of information from long-term memory to short-term memory. Lapses of attention or effort during encoding or retrieval can lead to forgetting. If consumers are unmotivated to process information carefully because of a lack of interest in a product, or if they are unable to process information carefully because of distractions or attempts to perform several cognitive tasks simultaneously (divided attention), absent-mindedness and the forgetting associated with it are likely to occur.

Depth-of-processing research shows that memory performance improves with effort.[19] A given word is easier to remember if it is processed at a deep level rather than at a shallow level. Level of processing can be manipulated experimentally by varying the difficulty of the questions we are asked about a word. For example, shallow encoding occurs when people are asked a simple question: Is TIDE printed in uppercase letters? Deeper encoding occurs when people are asked a more difficult question: Is TIDE a type of detergent? The word TIDE is more likely to be remembered when it is processed intensely rather than superficially. Consequently, ads that encourage consumers to think deeply about a product are more memorable than ads that encourage cursory processing. In a similar vein, simply reading a bunch of words is a bad way to prepare for an exam. Thinking deeply about the concepts, generating examples of the concepts, and relating the concepts to prior knowledge and experience is a much better way to study. Research on the **generation effect** shows that memory performance is enhanced when people generate their own answers to questions rather than simply reading them.[20] This occurs because generating answers requires more effort than simply reading answers, and memory improves as effort increases.

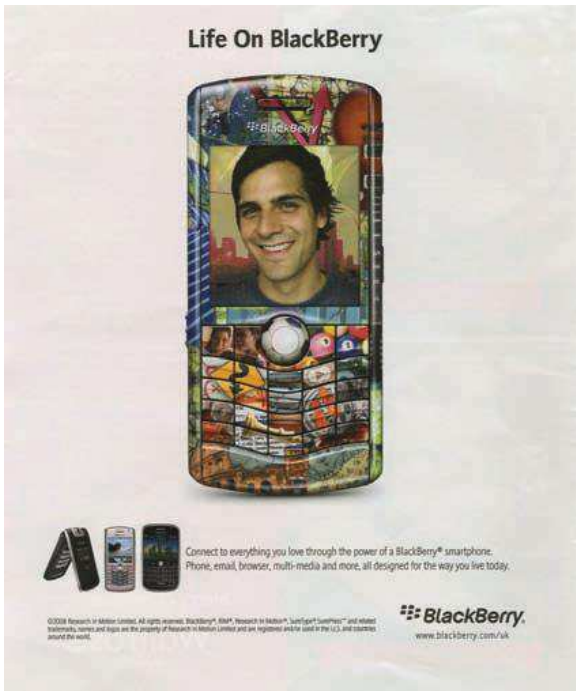


Image courtesy of The Advertising Archives

Memory aids such as electronic devices help eliminate absent-mindedness.

Absent-mindedness can also occur at the time of retrieval. When distracted, consumers often forget to perform actions they intended to perform. Consumers forget to take their medicine, pick up certain items at the grocery store, or keep appointments. In each example, consumers forget to perform a future action even though

they intended to do so. Memory aids such as post-it notes, pocket calendars, PDAs, and even tying string around a finger are often used to prevent this type of forgetting.

BLOCKING Forgetting frequently occurs because the information one is trying to retrieve is temporarily inaccessible as a result of **blocking** or interference from related information. The information one is trying to retrieve is stored in memory; it has not been lost over time; it had been encoded deeply; but the search for it in one's memory is not always successful. Sometimes people know they know the answer to a question, but they cannot quite put their finger on it. This is known as the **tip-of-the-tongue effect**: The answer seems to be on the tip of your tongue, but you can't quite retrieve it.[21] Students often complain that they knew the answer to an exam question, but couldn't retrieve it until after the exam was over. The answer was temporarily inaccessible because "ugly sisters" blocked or prevented retrieval of the correct answer. The name "ugly sisters" comes from the story of Cinderella, in which the nice Cinderella was dominated by her mean older sisters. In memory research, ugly sisters are incorrect answers related to the correct answer, and they are retrieved repeatedly instead of the correct answer.

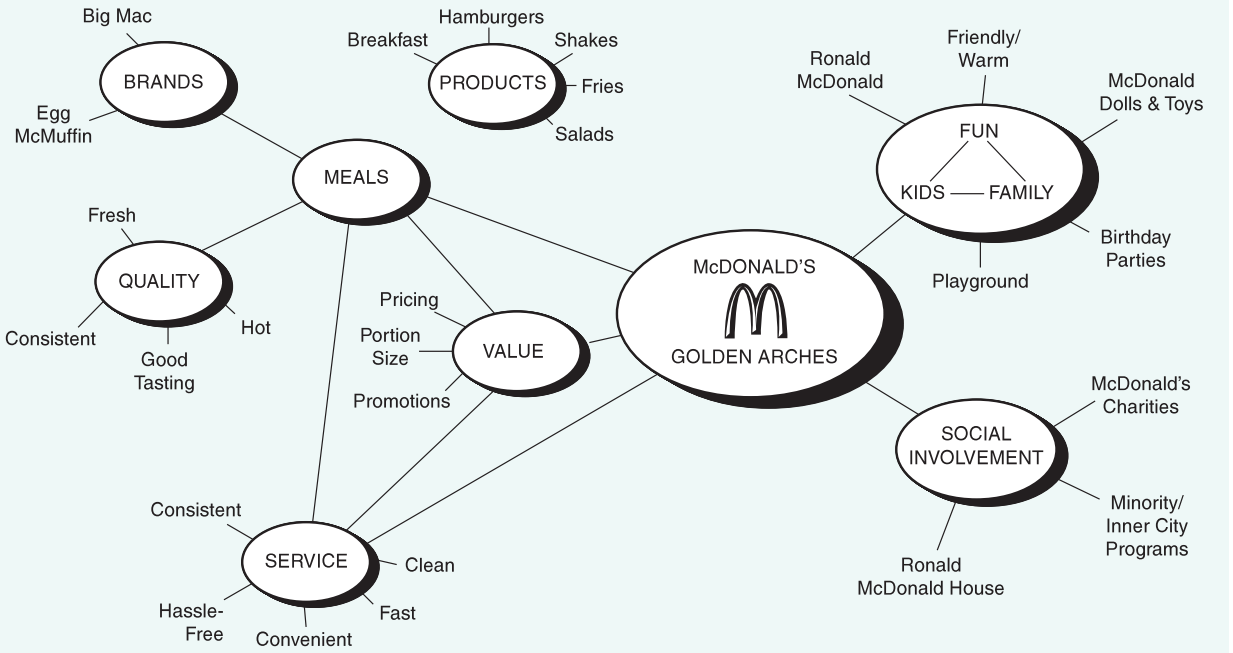
The tip-of-the-tongue effect shows that forgetting can occur even when the answer to a question is stored somewhere in long-term memory. The answer did not fade or decay over time. Instead, the answer is temporarily inaccessible because of interference from related information. Studies of very long-term memory show that people can remember information learned in high school (e.g., foreign languages, mathematics) even more than 50 years![22] Again, this shows that long-term memories do not necessarily fade or decay over time.

Studies of relearning provide the best evidence for forgetting without information loss. Relearning something you thought you forgot (e.g., foreign languages, mathematics) is easier than learning something for the first time.[23] In classic relearning studies, participants learned 20 pairs of numbers and words (e.g., 43-dog). Two weeks later, participants forgot about 25 percent of this material. In the relearning condition, participants relearned the same 20 pairs of numbers and words. In the control condition, participants learned new words paired with old numbers for all forgotten pairs (e.g., the original 43-dog was changed to 43-house). Memory performance was far better in the relearning condition than in the control condition. This result could not occur if forgotten information were lost forever.

According to the association principle of long-term memory, each **node**. idea, or piece of information stored in memory is connected to other nodes that are conceptually related by links known as **associations**.[24] Associations are learned via classical conditioning and operant conditioning. Related nodes are connected in a complex **associative network,** in which closely related nodes are connected directly by a single association, and distantly related nodes are connected by a chain or series of associations. **Activation** or retrieval refers to the transfer of information from inactive long-term memory to active short-term memory. **Spreading activation** refers to the idea that when people retrieve a particular node, they automatically think about other closely related nodes. An associative network is like a complex system of irrigation ditches; each node is like a pool of water connected to other pools via a system of ditches. When one pool is filled with water, the water spills out to other nearby pools. The more water poured into a pool, the farther the spillage spreads. Eventually, the water runs out and the spreading stops.

For example, whenever consumers think about a brand name, like McDonald's, they start thinking about associations to the brand (e.g., Big Macs, fries, shakes, Ronald

FIGURE 6.1 Associative Network



McDonald). A strong association leads to a **priming effect**: Simply thinking about the brand leads consumers to think about closely related concepts. The priming effect can be reduced or eliminated by adding new associations to consumers' associative networks. As the number of new associations increases, the likelihood that consumers will think about a particular old association decreases. New associations increase the complexity of consumers' associative networks and produce **associative interference**, in which the new associations compete with and block old associations.

Associative interference is commonly observed in advertising.[25] Old ads compete with new ads, and vice versa. **Proactive interference** occurs when information learned earlier blocks memory for information learned later. **Retroactive interference** occurs when information learned later blocks memory for information learned earlier. Both types of interference are common in advertising. Furthermore, greater proactive and retroactive interference occurs with advertisements for brands in the same product category (e.g., ads for different brands of cereal) than for brands in different product categories (e.g., ads for cereal and for cars).

Blocking is often frustrating because people realize that they know the answer they're looking for, but they can't find it. How can blocking be reduced? According to the **encoding-specificity principle**, memory is context dependent.[26] Contextual or background cues have a surprisingly powerful influence on memory performance. During encoding, contextual cues are encoded along with the target information one is trying to remember. Later, during retrieval, the contextual cues may be the same or different. Memory performance is enhanced when the contextual cues at the time of encoding and at the time of retrieval match or are highly similar. As the degree of similarity decreases, memory performance decreases.

For example, students typically attend lectures and take exams in the same classroom. In this case, the contextual cues (e.g., lighting, seating, background noise level, etc.) are the same during encoding (learning) and retrieval (taking an exam), and this

MARKETING IN ACTION

Marketplace Rumors

In the 1970s a rumor started that McDonald's used worms in its hamburger meat mixture. In the 1980s, another rumor said that Procter & Gamble donated a portion of its profits to the Church of Satan. In the 1990s, a third rumor announced that parked Audi 4000s automobiles would spontaneously slip into gear and crash into large objects. In each of these cases, the firms reacted by denying the rumors. However, sales of each of these brands dropped despite the denials. Why?

Denials backfire because they increase the strength of the association in memory between the firm and the rumor. A strong association leads to a **priming effect**: simply thinking about the firm leads consumers to think about the rumor associated with the firm. The best way to eliminate the priming effect is to add new associations to consumers' associative networks stored in memory. As the number of new associations increases, the likelihood that consumers will think about the rumor decreases.

New associations can include information on the various products and services offered by a firm, the charitable organizations sponsored by the firm, and the prestigious organizations to which the firm belongs (e.g., the Better Business Bureau). New associations increase the complexity of consumers' associative networks and produce **associative interference**. That is, new associations compete with old associations and reduce the probability that activation will spread to old associations.

Council of Better Business Bureaus

improves memory. If a professor wants to be mean, he or she could lecture in one room and give exams in a different room. In this case, the contextual cues present during encoding and during retrieval are different, and this reduces memory performance. Even small seemingly irrelevant background differences can have dramatic effects on memory performance. Larger background differences have even more dramatic effects. For example, students often hurt themselves by studying for an exam late at night while drinking lots of coffee. Then they take the exam in the morning without coffee. Nighttime contexts differ from daytime contexts in many respects (e.g., lighting, seating, fatigue levels, hunger levels, etc.) and high caffeine contexts differ from low caffeine contexts in many respects (e.g., alertness levels, thirst levels, etc.). The greater the differences between encoding contexts and retrieval contexts, the more memory performance decreases.

Marketers can use the encoding-specificity principle to their advantage by trying to increase the similarity of contextual cues present during encoding and during retrieval. Consumers often encode information about products while watching TV at home. Later, while shopping at a grocery store, they are likely to retrieve information about products to make informed purchase decisions. Obviously, large contextual differences exist between the home environment and the grocery store environment. These differences can be reduced by placing characters from advertisements viewed at home in the grocery store environment. For example, Life cereal's TV commercials feature Little Mikey, and Little Mikey's picture appears on boxes of Life cereal in grocery stores. Other advertising characters (e.g., the Pillsbury doughboy, Tony the tiger, the Keebler elves, Juan Valdez) are also featured on product packages or point-of-purchase displays to help consumers remember information from advertisements they viewed in different contexts.

MISATTRIBUTION Forgetting isn't the only memory problem consumers encounter. Memory can also be distorted from **misattribution**. Three different types of memory misattributions or confusions are possible:

1. source confusion
2. feelings of familiarity
3. false memories

Source confusion occurs when consumers remember reading a fact about a product but misremember where they read it.[27] Sometimes consumers believe that they read the information from a credible source (e.g., *Consumer Reports*), but they actually read it from a noncredible source (e.g., *National Enquirer*). Sometimes consumers believe that the conclusions they drew after reading a message about a product were actually stated in the message. In short, source confusion can lead consumers to trust product information more than they should.

The second type of memory misattribution is the tendency to confuse feelings of familiarity with a wide variety of possible judgments, including fame, confidence, liking, and truth.[28] The more familiar a brand name seems, the more famous and popular the brand seems to be. Answers to questions that come to mind readily are held with greater confidence. The more familiar an initially neutral product becomes, the more consumers like the product. This is known as the **mere exposure effect** because repeated exposure to a product increases familiarity and liking. This is one reason why consumers learn to like novel foods (e.g., sushi), beverages (e.g., martinis), words (e.g., afworbu), and songs (e.g., new tunes heard on the radio) more over time. As the familiarity of a product claim increases, the more consumers believe the claim. This is known as the **truth effect**.[29] Simple repetition (e.g., repetitive advertising) is one way to increase the familiarity of a product, a claim, or an idea, and simple repetition can increase judgments of fame, confidence, liking, or truth. Increasing the ease with which consumers can perceive, read, or comprehend product information also increases familiarity. Consumers are most likely to confuse familiarity with fame, confidence, liking, or truth when their attention is divided during encoding, retrieval, or both.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The third type of memory misattribution is a false memory, or the tendency to remember items or events that never happened.[30] In a typical false memory experiment, people study a list of words that are closely related to a non-presented word. For example, the words "sugar," "sweet," "chocolate," and "tasty" are closely related to the non-presented word "candy." When people are later asked to recall as many words from the list as possible, they frequently recall the word "candy," even though it was not presented. This occurs because it is easier to remember the gist or the general meaning of the presented words than to remember the specific presented words themselves.

SUGGESTIBILITY Misleading questions and suggestions can also lead to memory distortion.[31] For example, people who witness an automobile accident remember different events when they are asked, "How fast was the car going when it ran past the stop sign?"

versus "How fast was the car going when it ran past the yield sign?" They also remember different events when they are asked, "How fast was the car going when it smashed into the other car?" versus "How fast was the car going when it bumped into the other car?" Similarly, adults asked to remember their childhood experiences are more likely to remember instances of child abuse if they receive suggestions of child abuse from a psychotherapist. Advertising can also produce memory distortion. For example, after tasting a bland orange juice, consumers are more likely to misremember the orange juice as flavorful after seeing an ad suggesting that the product is flavorful than after seeing no ad. Advertising can distort memory for past experiences with a product.

BIAS Previously viewed advertising can also influence what is learned from current product experiences.[32] Advertising influences consumers' expectations, and expectations subsequently color what consumers see. To the extent that product experiences are ambiguous or open to multiple interpretations, expectations guide the interpretation of product experiences. Products seem larger, smaller, heavier, lighter, tastier, or more comfortable if consumers expect them to be larger, smaller, heavier, lighter, tastier, or more comfortable, respectively. Prior beliefs can bias current beliefs and experiences.[33] Consequently, learning from experience becomes difficult because prior beliefs and current experiences are perceived as more consistent than they actually are.

The opposite is also possible. Current beliefs can bias memory for prior beliefs and experiences. In a recent study, marketers were led to prefer supplier A over supplier B. Three weeks later, the same marketers were led to prefer supplier B over supplier A. When they were asked about their earlier preference, the marketers indicated that they always preferred supplier A.[34] Even when preferences change dramatically over time, people often assume that their earlier preferences were the same as their current preferences. Consequently, people often believe that their preferences are more consistent than they actually are.

PERSISTENCE Sometimes people can't forget things they want to forget. Traumatic events are often difficult to forget. Some songs and advertising jingles get stuck in our heads. This is known as earworm.[35] Try not to think about a catchy song (such as "Who Let the Dogs Out") or advertising jingle (such as the Subway jingle) that you've heard recently. Simple, catchy, repetitive tunes are especially likely to produce earworm. Trying not to think about a specific song, object, or issuep is surprisingly difficult. After trying not to think about a specific topic, people are more likely to think about it later when they are no longer trying not to think about it! Momentary distractions can also lead people to think more about a topic they are trying not to think about. The **persistence** of unwanted thoughts can be frustrating, distracting, and sometimes depressing.