

## ***FOCUS ON VOCABULARY AND LANGUAGE***

. . . *to unlock the atom and crack the genetic code* . . . Humans have created many wonderful and amazing devices. We have also investigated and solved numerous questions about the physical world, such as the nature of the atom (we have *unlocked the atom*) and the structure of genes (we have *cracked the genetic code*). These examples illustrate how our shared intelligence (*collective genius*) has been utilized for innovative and creative endeavors.

. . . our species is *kin to* . . . Myers notes that we are biological creatures related to (*kin to*) other species of animals, and we are influenced by the same principles that produce learning in rats and pigeons. We have exceptional abilities for innovation, learning, memory, and rational thinking; yet, at the same time we are prone to making mistakes and thinking and acting irrationally (we are *not-so-wise humans*).

### **Thinking**

#### *Concepts*

For most of us, the robin is the *birdier bird* . . . We develop our ideas of how things go together (our *concepts*) from definitions or by using **prototypes**. The best example (*prototype*) of a bird is a robin (*it's the birdier bird*) rather than a penguin, a kiwi, or an ostrich.

#### *Problem Solving: Strategies and Obstacles*

Thomas Edison tried thousands of light bulb filaments before *stumbling upon one that worked*. Edison was a famous inventor and he used *trial and error* to develop the metal filament that makes a light bulb glow brightly. Using *trial and error*, he came upon the solution by chance (*he stumbled upon one that worked*). Myers contrasts this method with following an **algorithm** (a step-by-step method that always ends with a solution and is typical of computer programs).

Sometimes we puzzle over a problem and *the pieces suddenly fall together in a flash of insight*—an abrupt, *true-seeming*, and often satisfying solution (Topolinski & Reber, 2010) **Insight** is the sudden and often novel realization of the solution to a problem. The answer typically arrives in conscious awareness quickly and unexpectedly (*the pieces suddenly fall together*) without any forewarning that the solution is imminent (*with no prior sense of “getting warmer”*). When we solve a problem through *insight* (*when the answer pops into mind*), we feel a sense of accomplishment, as the solution often appears to be accurate (*true-seeming*). This feeling of satisfaction is sometimes accompanied by verbal exclamations such as “Aha!” Research has shown that abrupt and unexpected solutions to a problem (*sudden flashes of insight*) are preceded by frontal lobe activity along with a surge (*burst*) of activity in the right temporal lobe.

#### *Forming Good and Bad Decisions and Judgments*

*Should I shoot the basketball or pass to the player who's hot?* (Don't take this sentence literally.) Myers is using *basketball* to illustrate that we usually follow our subjective feelings (*intuitions*) rather than taking the time to use logic and reason. For example, in a game of *basketball*, the player holding the ball must decide whether to throw the ball through the hoop (*shoot the basketball*) or pass it to a player who has scored frequently (*who's hot*).

. . . they do it [make decisions] mostly by *the seat of their pants*. When we make decisions based on subjective or intuitive reasons, rather than using logical, reflective problem-solving strategies, we

are using *seat-of-the-pants* judgments. Thus, when we employ **heuristics** (simple thinking strategies), we may make decisions that are incorrect and not very smart (*dumb decisions*).

When we need to act quickly, the mental shortcuts we call *heuristics* enable *snap judgments*. We can make very quick decisions (*snap judgments*) using a simple thinking strategy (**heuristic**) that is relatively efficient and effective. However, estimating the likelihood of events based on their accessibility in memory (*the availability heuristic*) can cause us to make mistakes (*lead us astray*).

We fear swimming in ocean waters because *we replay Jaws in our heads*. *Jaws* is a classic movie about a great white shark attacking people. Vividly remembering this horror film (*replaying it in our heads*) can create unrealistic fears about swimming in relatively safe ocean waters. When the statistical reality of danger is low, one clear, memorable case can exaggerate (*exacerbate*) our fears; so, thanks to the availability heuristic, we may become frightened of extremely rare events.

Meanwhile, the lack of comparably available images of global climate change—which some scientists regard as a future “*Armageddon in slow motion*”—has left most people little concerned (Pew, 2007). *Armageddon* refers to the battle between the forces of good and evil and is predicted to mark the end of the world. Because of the *availability heuristic* along with readily accessible images, we have come to fear extremely rare events, such as terrorist attacks; and we display less concern for something that may be ultimately much more destructive, such as gradual global climate change (“*Armageddon in slow motion*”). As Myers notes, dramatic outcomes startle and shock us (*make us gasp*), whereas statistical probabilities are not readily understood (*we hardly grasp them*).

(*Thinking Critically About: The Fear Factor—Why We Fear the Wrong Things*) Human emotions were road tested in the Stone Age. During our evolutionary past, certain traits or characteristics were selected for because they helped our ancestors survive. Those that survived because of these attributes passed them on to their descendants. Fearful reactions to snakes, lizards, spiders, confinement, and heights were selected for (*they were road tested*) during earlier times (*in the Stone Age*) and are part of human nature today.

*Belief perseverance often fuels social conflict . . .* Our irrationality is on display when we persist (*persevere*) in our views despite evidence to the contrary (**belief perseverance**). This irrationality can lead to an increase in strong feelings or passions over controversial issues (*it fuels social conflict*). Myers suggests one solution for those who wish to restrain (*rein in*) the effect of *belief perseverance*—give serious consideration to beliefs opposite to your own (*consider the opposite*).

*So, are our heads indeed filled with straw?* The discussion about human irrationality might lead to the conclusion that we have ineffective and inefficient cognitions (*heads filled with straw*). Myers, however, is optimistic and suggests that we can learn about our irrational inclinations (*tendencies*) and be alert to the dangers that can result in poor or foolish (*dumb*) decisions. We can also try to avoid emotional responses (*gut fears*) and biased opinions (*prejudices*) that are based on intuition.

. . . *gut feelings . . .* *Gut feelings* are emotional reactions that often occur unconsciously and immediately without rational thought or reflection (*the intuitions of our two-track mind*). Not only can our irrational thinking seriously affect (*plague*) our attempts to solve problems, but our intuitions can also encourage anxiety and apprehension (*gut fears*) as well as intolerance (*prejudice*). Further, our learned associations can generate unconscious reactions that arise (*surface*) as immediate emotional responses (*gut feelings*).

*Our two-track mind* makes *sweet harmony* as smart, critical thinking listens to the creative *whispers* of our vast unseen mind, and then evaluates evidence, tests conclusions, and plans for the future.

Our mind functions on two levels, one conscious and one unconscious (*our two-track mind*). When we are careful to *check our intuitions* (our mostly unconscious thinking) against *reality* (our rational conscious thinking), the interaction can produce a better combination (*sweet harmony*) as the large hidden, unseen mind quietly communicates (*whispers*) to the aware, critical, intelligent mind.

### *Do Other Species Share Our Cognitive Skills?*

Among his [Alex, the African Grey parrot's] *jaw-dropping numerical skills* was the ability to comprehend numbers up to 6. Alex the parrot could name and categorize objects he was shown. He had an amazing capacity to identify the number of objects displayed and to add the numbers together (*jaw-dropping numerical skills*), saying which of two sets of numbers was larger. As Myers notes, "other species display many remarkable cognitive skills."

Then suddenly, *as if thinking "Aha!"* Sultan [the chimp] jumped up and seized the short stick again. Köhler's experiment with the chimpanzee Sultan showed that our closest relatives are capable of **cognition**. When the fruit was out of reach, Sultan noticed the short stick and used it to pull a longer stick into the cage, which he then used to get the fruit. It was as if he had a sudden intuition (*as if thinking "Aha!"*), which in humans might elicit the verbal exclamation "Aha!"

## **Language**

### *Language Development*

With remarkable efficiency, we sample tens of thousands of words in our memory, effortlessly *assemble them* with near-perfect syntax, and spew them out, three words a second (Vigliocco & Hartsuiker, 2002). Humans have an amazing facility for **language**. With little or no effort, we can select the appropriate words from the tens of thousands in memory, put them together (*assemble them*) quickly, and verbally produce them in rapid succession (*spew them out, three words a second*). As Myers notes, we rarely form sentences in our minds before speaking; rather, we arrange sentences effortlessly as we prepare to talk (*we organize them on the fly as we speak*). Given the numerous ways we can make mistakes (*the many ways there are to mess up*), it's astonishing that we can accurately follow the social and cultural rules of interactive dialogue (*master this social dance*).

. . . *milestones* . . . A *milestone* is an event of significance or importance. Children's language development moves from simplicity to complexity through age-related stages (*milestones*), each one important and significant in the acquisition of linguistic competence. (Originally, a *milestone* was a large roadside stone inscribed with the distance in miles to nearby towns.)

Yet by 4 months of age, babies can recognize differences in speech sounds (Stager & Werker, 1997). *They can also read lips* . . . When people speak, their lips move in ways that correspond to the sounds they utter. Many deaf people can understand what is being said by watching how the lips move (by *lip reading*). Not only can very young children tell the difference (*discriminate*) between sounds, they can also recognize lip movements that correspond with certain sounds (*they can also read lips*). This capacity to understand what is said to and about them (*receptive language ability*) matures before the ability to produce language (*productive language ability*).

The window on language learning closes gradually in early childhood. During the early years of language development, we easily and accurately acquire (*master*) **grammar** and accent. After that critical period, the language acquisition system tends to work less hard, and *mastering* another grammar becomes more difficult (*the window on learning language closes*). Later-than-usual

exposure to language, at age 2 or 3, sets loose (*unleashes*) the non-used system for language acquisition (*the idle language capacity*) in a child's brain, producing an onslaught (*rush*) of language. By age 7, those who have not been exposed to language gradually lose their ability to become proficient in *any* language.

### *The Brain and Language*

Think about it: What you experience as a *continuous, indivisible stream of experience* is actually but the visible *tip of a subdivided information-processing iceberg*. Just as most of the mass or volume of an iceberg is below the surface of the ocean and out of sight, most mental functioning goes on without conscious awareness. Our conscious awareness (*stream of experience*) appears to be without gaps or breaks (it is *continuous* and *indivisible*) but it arises from subsystems (it is *subdivided*) localized in particular brain regions. The unified consciousness we experience is a small part (*the tip of the iceberg*) of total information processing.

### *Do Other Species Have Language?*

If in our use of language we humans are, as the *psalmist* long ago *rhapsodized*, “little lower than God,” where, then, do other animals fit in the scheme of things? The *psalmist* (an author of religious or sacred songs) spoke in an extravagantly enthusiastic manner (*rhapsodized*) about human nature, and Myers notes that it is our use of human language that elevates us above nonhumans. Nevertheless, we do share a capacity for language with other animals.

Were the chimps *language champs* or *were the researchers chumps*? Critics of “ape language” argue that, for animals, language acquisition is painfully slow, resembles conditioned responses, does not follow syntax, and is little more than imitation. In addition, demonstrations of animal language are always subjectively interpreted by their trainers. Myers asks: Were the chimps exceptionally talented (*language champs*) or were the researchers just easily fooled or duped (*were they chumps*)? The answer is that the controversy has led to further research and progress, as well as a renewed appreciation of our own—and of our closest relatives’—capacity for communication and language.

*It took several hours for the foster mom and infant to warm to each other*, but then Washoe *broke the ice* by signing, “Come baby” and cuddling Loulis. At first, the chimpanzee Washoe did not respond affectionately to her adopted son Loulis (*it took several hours for them to warm to each other*). When Washoe made a welcoming gesture by signing for Loulis to approach, that initiated an interaction (*it broke the ice*) and helped establish their relationship.

### **Thinking and Language**

Thinking and language intricately intertwine. Asking which comes first is one of psychology's *chicken-and-egg questions*. “Which came first: the chicken or the egg?” is an age-old riddle. Clearly, you need an *egg* to produce a *chicken*, but you also need a *chicken* to lay the *egg*. So, like this riddle, psychologists have argued over which comes first, our ideas and thoughts or the words we use to name and verbalize them. Young children's thinking ability develops in parallel (*hand in hand*) with their language skills. Myers concludes that language influences (but does not determine) thought—*thinking affects our language, which then affects our thought*.

*Language Influences Thinking*

. . . *we shouldn't skip a beat* . . . When we hear the generic “he,” we are much more likely to imagine a male than a female. Myers notes that, if “he” and “his” were truly gender-free, we should not pause and reflect (*we shouldn't skip a beat*) when hearing that “*man, like other mammals, nurses his young.*”