

Chapter 2

Components of Motivation

Overview: The purpose of this chapter is to provide a detailed description of and justification for the multi-perspective (i.e., biological, learning, and cognitive) approach taken in this book toward the study of motivation. Theories of motivation are ‘concerned with the origins or causes of action’. Early theories tended to provide rather narrow causal explanations of motivated behavior, often focusing solely on either biological or learning or cognitive origins of action (instead of taking an integrative approach), and, in the process, either ignoring ‘individual differences’ in motivation or failing to provide adequate explanations for such differences. Using the context of contemporary ‘evolutionary psychology’, the text takes a broader, more integrative approach, examining how dispositions lead to action through the joint operation of biological, learning, and cognitive processes. These processes are the ‘components of motivation’.

Outline:

The Biological Component:

Origin of Brain Design

The Example of Temperament

Monozygotic and Dizygotic Twins

Brain Design and Motivation

Brain Structure and Brain Circuits

Some Important Brain Circuits in Motivation

Approach and Avoidant Motivation:

The Behavioral Activation System (BAS)

and the Behavioral Inhibition System (BIS)

Disposition to Experience Pleasure

The Reward Pathway also called the Dopaminergic Pathway

The Prefrontal Cortex

The Amygdala

The Concept of Plasticity

Self-Regulation of Behavior and the Prefrontal Cortex

The Role of Neurotransmitters in Information Processing

Neurotransmitters and Moods

Summary

Practical Application 2-1: Becoming Aware of Your Biological Processes

The Learned Component:

Attention and Learning

Associative and Cognitive Learning

Is Attention Under Voluntary Control

Classical Conditioning:

Conditioning and Adaptive Behavior

Context and Conditioning

Instrumental Learning:

Secondary Rewards and Instrumental Learning

Social Incentive Theory
Imitation and Observation Learning
Summary
Practical Application 2-2: The Need for Intention and Planning When Changing Unwanted Habits---Taking Charge Through Self-Regulation
The Cognitive Component:
Cognitive Theories:
 The Nature of Cognitions:
 Categories and Labels
 Beliefs, Attitudes, and Values
 Cognitive Dissonance Theory
 Implicit Theories:
 Habits, Automatic Behavior, and Cognition
 An Example: What Causes Happiness?
 Individual Differences:
 Attribution Theory: Perceiving the Causes of Behavior
 Locus of Control Theory: Internal and External Causes
 Context and Cognition
 Social Incentive Theory and Cognitive Theory
Summary
Practical Application 2-3: Becoming Mindful of Your Cognitive Processes
An Example of a Components Approach:
 Motivation for Running
 Summary

Main Points:

1. In studying motivation, we are concerned with understanding how dispositions can lead to action through the interaction of biological, learned, and cognitive processes or components.
2. Evolutionary psychologists are attempting to answer the question of why the brain is designed the way it is.
3. In contrast with sociobiologists, evolutionary psychologists have argued that our social nature has emerged as an adaptation to becoming hunters and gatherers.
4. The disposition to seek pleasure has been linked to reward systems while the tendency to avoid or withdraw has been linked to the amygdala.
5. The the left prefrontal cortex has been linked to positive affect while the right prefrontal cortex has been linked to negative affect.
6. Neurotransmitters are important not only for information transmission but also for creating the moods we experience.

7. What we learned is largely governed by attention.
8. Attention is not completely under our control and is limited.
9. There are two types of learning: classical conditioning and instrumental learning.
10. Psychologists use the term cognitive to refer to processes that have to do with knowing. Cognition, therefore, involves thinking, perceiving, abstracting, synthesizing, organizing, or any other process that allows the individual to conceptualize the nature of the external world and the self.
11. Many of our beliefs, attitudes, and values are often initially copied from our parents; however, they are also based on our own experiences and our own desires.
12. Cognitive dissonance theory has its roots in the idea that people need to experience cognitive consistency. According to cognitive dissonance theory, humans are inclined to process information in such a way that it will be consistent with existing categories, values, beliefs, and behavior.
13. Implicit theories are hypotheses, models, and beliefs that we have about the nature of the external world (world theories) and about what we need to do to satisfy our desires in this world (self theories).
14. Automatic behaviors refer to intentional behaviors that have become habitual.
15. Analysis of why people run indicates that all three components—biological, learned, and cognitive—can be important in motivating a behavior.

Concepts, Terms and Theories:

Accommodation

Active Construction of Beliefs

Amygdala

Assimilation

Associative Learning

Attribution Theory

Automatic Behavior

Behavioral Activation System (BAS)

Behavioral Inhibition System (BIS)

Brain Circuit

Brain Design

Classical Conditioning

Cognitive Dissonance Theory

Cognitive Learning

Disequilibrium

Dizygotic Twins

Dopaminergic Pathway

Evolutionary Psychology

Experiential System

Extended Adaptation

External Locus of Control

Extinction

Imitation

Implicit Theories

Instrumental Learning

Internal Locus of Control

Limbic System

Locus of Control Theory

Modeling

Monozygotic Twins

Neurotransmitter

Observation Learning

Opponent Process Theory

Piaget's Cognitive Theory

Plasticity of Brain Structures

Prefrontal Cortex

Primary Reinforcer

Receptor Orientation

Reward Pathway

Secondary Reinforcer

Selective Attention

Self-Monitoring

Social Incentive Theory

Sociobiology

Stereotypes

Symbolic Reinforcer

Temperament

Classroom Activities / Demonstrations/ Discussions:

1. Use the 'Stroop Effect' to demonstrate both the nature of selective attention (e.g., the difficulty in attending to and responding separately to different aspects of the stimulus field such as color of letters vs. meaning of letters) and the relationship between 'automatic skills' (automatized reading) and 'intention' (naming the color of the stimulus letters) in cognitive processes. Note: automatic reading is a good example of how practice or repetition can convert intention into a powerful habit, so much so, that once intention becomes habit, it can conflict with and overpower subsequent different intentional behaviors.

2. Present two different stimulus events (each 5 seconds in duration)
 - a.) simultaneously and measure recall for both stimulus events.
 - b.) separately and measure recall for each event when presented alone.The difference between the magnitude of recall for the simultaneous presentation condition and that for the alone presentation condition is a measure of the effect of selective attention on learning and information processing.

Suggested stimulus events:

Stimulus Event 1: successive 1-second-duration presentation of five different visual images (can be done with computer and multimedia equipment or with traditional overhead projector).

Stimulus Event 2: a 5-second presentation of an audio message such as the reading of a list of randomly selected numbers for 5 seconds (can be done with computer and multimedia equipment or with traditional tape player/recorder).

Note: Two separate but comparable sets of visual images and auditory messages should be used. One set to be used as stimulus events 1 and 2 for the simultaneous presentation condition, the other set to be used for stimulus events 1 and 2 alone presentation.

Depending upon class discussion, this in class activity should take no more than 10 to 20 minutes of class time.

3. Subjective Contours: Project a subjective contour image onto a video screen or monitor. Subjective contour stimuli are a good illustration of information processing 'adding something to the concrete or raw sensory data' to perceive the contour of a meaning object. Discuss how this tendency relates to stereotypes, implicit theories, and interpretations of social interactions.
4. Reversible Figures: Project a reversible figure (e.g., face/vase figure) onto a video screen or monitor. Discuss with the class how this is an illustration of preconscious active search for meaning or organization (that is, point out that the concrete or raw stimulus is constant but the perceptual organization flips and flops from one organization to another—face to vase to face, etc. What's going on here?) How might this relate to the operation of attitudes, values, beliefs or implicit theories and action?

5. Asch's Classic Primacy Effect: Discuss or demonstrate (by presenting the following five traits in order and then in the reverse order: intelligent, industrious, impulsive, critical, stubborn) Asch's primacy effect (Asch, 1946). Discuss the change-of-meaning hypothesis as an explanation of his results and have the class discuss how this relates to 'consistency and resistance to change' and implicit theories in information processing.

6. Use the concept of 'plasticity of brain design' to introduce the concept of 'bidirectional influences of biology and environmental experience' on the arousal, direction, and persistence of behavior. Use both of the aforementioned concepts to introduce the concept of 'critical periods' in postnatal development.

Weblinks:

1. See the University of California at Santa Barbara's Center for Evolutionary Psychology website (<http://psych.ucsb.edu/research/cep/primer.html>) for a 'primer on evolutionary psychology' and to access current articles in this area.
2. McGill University's website (<http://www.thebrain.mcgill.ca/>) is an excellent site for students and instructors for in-depth discussions and diagrams of the brain and motivation and emotion. Their site presents material on three levels of explanation (beginner, intermediate, and advanced) and on five levels of organization (social, psychological, neurological, cellular, and molecular). The 'Emotion and Brain' module and the 'Pleasure and Pain' module are particularly relevant to the current chapter as well as to the remaining chapters of the text where the BAS and BIS, the role of neurotransmitters in moods and information processing, and the role of limbic system structures in motivation and emotion are discussed.
3. PubMed, the National Library of Medicine website, is an excellent site for access to free abstracts and links to full text current articles related to the topics of this chapter and the remaining chapters. Search by authors, journals, or topic at this site. (<http://www.ncbi.nlm.nih.gov/entrez/query.org>).
4. For an illustration of the 'Stroop Effect' try the Consciousness Module at <http://cogsci.uncc.edu/>.

Questions:

1. Early motivation theorists hypothesized that (p. 27)
- A. instincts cause actions.
 - * B. needs cause actions.
 - C. energy causes action.
 - D. rewards cause action.

Factual

2. The term mind, as opposed to brain, is often used by evolutionary psychologists (p. 27)
- A. because the brain is an adaptation.
 - B. because the brain was designed some 250,000 years ago.
 - * C. to emphasize the idea that the brain is made up of several intelligent systems.
 - D. to emphasize the idea that humans are social beings.

Factual

3. The term “adapted mind” refers to the idea that the human brain as we know it today is (p. 27)
- A. designed to make us selfish.
 - B. capable of learning.
 - C. capable of problem solving.
 - * D. capable of learning and problem solving.

Factual

4. The fact that we can build complex and high-tech machines such as jets and computers (p. 27-28)
- * A. is an illustration of the concept of ‘extended adaptation’ of the brain.
 - B. indicates our ancestors had to carry out complex computations.
 - C. came as a result of needing to live in large groups.
 - D. all of these are correct.

Application

- W5. Evolutionary psychologists assume that humans (p. 28)
- A. learned to be a selfish animal.
 - B. evolved to be a selfish animal.
 - C. learned to be a social animal.
 - * D. evolved to be a social animal.

Factual

6. Evolutionary psychology, in contrast to sociobiology, emphasizes the idea that (p. 28)
- A. acting in a selfish manner has an evolutionary advantage.
 - * B. acting in a selfless manner has an evolutionary advantage.
 - C. there is no evolutionary advantage to acting in a selfish manner.
 - D. there is no evolutionary advantage to acting in a selfless manner.

Conceptual

7. It has been suggested by Buck that humans have two central drives (minds): (p. 28)
- * A. self-preservation and preservation of the species.
 - B. self-preservation and a focus on happiness.
 - C. reproduction and preservation of the species.
 - D. health and happiness.

Factual

- W8. It has been suggested by Buck that humans tend to (p. 28)
- A. act in a selfish manner in all situations.
 - B. act in a selfish manner when it is appropriate.
 - C. act in a selfless manner when it is appropriate.
 - * D. act in a selfish or selfless manner when it is appropriate.

Factual

9. Temperament refers to (p. 28)
- A. how we react to the world (reactivity).
 - B. how we self-regulate ourselves (self-control).
 - C. how we understand the world (self-knowledge).
 - * D. how we react to the world and how we self-regulate ourselves.

Factual

- W10. Which of the following statements most accurately describes the view of evolutionary psychology on the origin or cause of behavior? (p. 27-30)
- A. Learning and cognition cause action.
 - B. Needs cause action.
 - C. Genes cause action.
 - * D. Genes determine brain design which produces dispositions to action.

Conceptual

11. Monozygotic twins result from (p. 29)
- * A. the division of a single egg.
 - B. the fertilization of two different eggs by different sperm.
 - C. the fertilization of the same egg by two different sperm.
 - D. the fertilization of two different eggs by the same sperm.

Factual

12. Dizygotic twins result from (p. 29)
- A. the division of a single egg.
 - * B. the fertilization of two different eggs by different sperm.
 - C. the fertilization of the same egg by two different sperm.
 - D. the fertilization of two different eggs by the same sperm.

Factual

13. Which of the following would be the best procedure to use to try to shed some light on the role that learning and cognition play in causing individual differences in behavior? (p. 29-30)
- A. observe the effects of raising ordinary siblings in different environments
 - B. observe the effects of raising dizygotic twins in different environments
 - * C. observe the effects of raising monozygotic twins in different environments
 - D. observe the effects of raising monozygotic twins in the same environment

Conceptual

14. Brain design is such that it triggers _____ which, in turn, motivate us to act. (p. 30)
- A. thoughts
 - * B. emotions
 - C. neural activity
 - D. needs

Conceptual

15. According to Gray's model of approach/avoidance motivation, the _____ is activated by conditioned signals of rewards and nonpunishment. (p. 30)
- * A. behavioral activation system
 - B. behavioral inhibition system
 - C. immune system
 - D. endocrine system

Factual

- W16. Activation of the _____ serves to promote the suppression of inappropriate behavior. (p. 31)
- A. behavioral activation system
 - * B. behavioral inhibition system
 - C. immune system
 - D. endocrine system

Conceptual

17. Jack likes to take risks and shows little or no fear when approaching new tasks. Jack's behavior may be due to (p. 31)
- * A. his BAS being more active than his BIS.
 - B. his BAS being less active than his BIS.
 - C. his BAS and BIS being equally active.
 - D. his immune system suppression.

Applied

18. Sheila tends to avoid meeting strangers and stays away from situations that are unfamiliar and those in which something unexpected may occur. Sheila's behavior may be due to (p. 31)
- A. her BAS being more active than her BIS.
 - * B. her BAS being less active than her BIS.
 - C. her BAS and BIS being equally active.
 - D. her immune system suppression.

Applied

- W19. The dopaminergic pathway (p. 31)
- A. helps humans learn adaptive behaviors.
 - B. helps humans learn both adaptive and nonadaptive behaviors.
 - C. plays a role in creating positive affect.
 - * D. helps humans learn both adaptive and nonadaptive behaviors and plays a role in creating positive affect.

Conceptual

20. The existence of the reward pathway in the brain indicates, among other things, that (p. 31)
- A. there is a biological basis for feelings of aggression.
 - B. there is a biological basis for feelings of pleasure.
 - C. there are biological systems to help us acquire adaptive behaviors.
 - * D. there is a biological basis for feelings of pleasure and biological systems to help us acquire adaptive behaviors.

Conceptual

21. Individuals with greater baseline activity in the _____ tend to have a bias toward experiencing greater _____. (p. 32)
- A. right prefrontal cortex; positive affect
 - * B. left prefrontal cortex; positive affect
 - C. right amygdala; positive affect
 - D. none of these are correct

Conceptual

22. Individuals with greater baseline activity in the _____ tend to have a bias toward experiencing greater _____. (p. 32)
- A. right prefrontal cortex; negative affect
 - B. left prefrontal cortex; negative affect
 - C. right amygdala; negative affect
 - * D. none of these are correct

Conceptual

23. Which of the following is most strongly associated with the idea that innate predispositions can be altered (at least somewhat) by certain experiences or thought processes? (p. 33)
- A. attribution
 - B. cognitive dissonance
 - * C. plasticity of brain structures
 - D. individual variation in genes

Conceptual

24. According to the text, it has been argued that the ability to pursue goal-directed behavior comes largely from (p. 33)
- * A. having a well developed prefrontal cortex.
 - B. having a well developed limbic system.
 - C. having a well developed amygdala.
 - D. having a well developed reward pathway.

Factual

25. Neurotransmitters are involved in (p. 33-34)
- A. the transmission of information.
 - B. positive moods.
 - C. the experience of pain.
 - * D. all of these.

Factual

W26. _____ is thought to play an important role in regulating anxiety and information processing. (p. 34)

- A. Serotonin
- B. Dopamine
- C. Norepinephrine
- * D. GABA

Conceptual

27. Substance P is involved in (p. 34)

- * A. the transmission of pain.
- B. positive moods.
- C. negative moods.
- D. activation of the brain.

Factual

W28. Moods (p. 35)

- A. are useful in helping us to understand our behavior.
- B. are useful in helping us redirect our behavior.
- C. serve no useful purpose.
- * D. are useful in helping us to understand and redirect our behavior.

Conceptual

29. Attention has been found to be (p. 36)

- A. under our control (voluntary).
- B. not under our control (involuntary).
- * C. sometimes under voluntary and sometimes under involuntary control.
- D. externally controlled.

Factual

30. _____ is thought to depend upon 'receptor orientation and selective attention', while ____ is thought to depend upon 'organizational tendencies to construct meaning'. (p. 36)

- A. Classical conditioning; instrumental learning
- B. Instrumental learning; classical conditioning
- * C. Associative learning; cognitive learning
- D. Cognitive learning; associative learning

Conceptual

31. Because attention is not always under voluntary control, psychologists often make a distinction between (p. 37)
- * A. deliberate and incidental learning.
 - B. fast and slow learning.
 - C. complete and incomplete learning.
 - D. molar and micro learning.

Conceptual

32. An event that elicits a response as a result of having been paired with another event that elicits an innate response is called (p. 37)
- A. a conditioned response (CR).
 - B. an unconditioned response (UCR).
 - * C. a conditioned stimulus (CS).
 - D. an unconditioned stimulus (UCS).

Factual

33. A response that is elicited by an environmental event without the benefit of previous learning is called (p. 37)
- A. a conditioned response (CR).
 - * B. an unconditioned response (UCR).
 - C. a conditioned stimulus (CS).
 - D. an unconditioned stimulus (UCS).

Factual

34. The fact that in classical conditioning a subject's 'freedom of movement' has to be restrained, highlights the important role of _____ in this form of learning. (p. 38)
- * A. attention
 - B. contiguity
 - C. information processing
 - D. none of these

Application

- W35. According to the text, the fact that "a usual dosage level" of a drug can cause an overdose when taken in a new or unfamiliar environment may be explained by (p. 39)
- A. classical conditioning and the blocking phenomenon.
 - B. instrumental learning and the blocking phenomenon.
 - * C. classical conditioning and the opponent process.
 - D. instrumental learning and the opponent process.

Conceptual

36. Instrumental learning (p. 40)
- A. involves associating a stimulus with a response.
 - B. involves presenting a reward for a desired behavior.
 - C. involves presenting a punishment for undesired behavior.
 - * D. involves all of these.

Factual

37. The main concept used in social incentive theory is (p. 41)
- A. positive reward.
 - B. punishment.
 - * C. approval.
 - D. inhibition.

Factual

38. The use of categories and labels is most indicative of which of the following attentional mechanisms? (p. 34, 44)
- A. receptor orientation
 - B. selective attention
 - * C. organizational tendencies
 - D. receptor orientation and selective attention

Conceptual

39. Within Piaget's theory, assimilation has to do with (p. 43)
- * A. the processing or integration of information contained in the environment.
 - B. the development of cognitive structures.
 - C. the motivational process that gives rise to the development of cognitive structures.
 - D. disequilibrium.

Factual

40. Within Piaget's theory, accommodation has to do with (p. 43)
- A. the processing or integration of information contained in the environment.
 - * B. the development of cognitive structures.
 - C. the motivational process that gives rise to the development of cognitive structures.
 - D. disequilibrium.

Factual

41. Based upon the discussion in the text, humans are inclined to organize information according to certain rules, principles, and theories that give them the tendency to (p. 44)
- A. see the world and events accurately.
 - B. see the world as consistent and predictable.
 - C. trust their cognitive structures even when they are no longer in harmony with the world.
 - * D. see the world as consistent and predictable and trust their cognitive structures even when they are no longer in harmony with the world.

Conceptual

42. How people categorize or label an event (p. 45)
- A. has no effect on their feelings or actions.
 - B. affects how they act but not how they feel.
 - C. affects how they feel but not how they act.
 - * D. affects both feelings and actions.

Conceptual

- W43. An individual who labels him or herself as an alcoholic versus a heavy drinker (p. 45)
- A. is no different when it comes to drinking.
 - B. is more likely to drink less.
 - * C. is more likely to lose control of his or her drinking.
 - D. is less likely to lose control of his or her drinking.

Application

44. The beliefs, attitudes, and values that people hold (p. 45-46)
- A. are copied from their parents.
 - B. are constructed on the basis of their experiences.
 - * C. are both copied and constructed.
 - D. tend to be highly rational.

Factual

45. Stereotypes often arise when people have (p. 46)
- A. limited experience.
 - B. no personal knowledge and rely on the beliefs of other people.
 - C. an internal locus of control.
 - * D. limited experience and no personal knowledge, but tend to rely on the beliefs of other people.

Factual

46. _____ theory argues that we are motivated to process information in such a way as to maintain consistency between our beliefs, attitudes, and actions. (p. 46)

- * A. Cognitive dissonance
- B. Social incentive
- C. Self-actualization
- D. Attribution

Factual

47. Cognitive dissonance theory suggests that (p. 46)

- * A. people bring their cognitions (attitudes) in line with their behavior.
- B. people bring their behavior in line with their cognitions (attitudes).
- C. cognitions (attitudes) and behavior are independent of each other.
- D. people enjoy the feeling that accompanies cognitive dissonance.

Conceptual

48. Cognitive dissonance theory suggests that humans are inclined to (p. 46-47)

- A. process information to make it consistent with their beliefs and attitudes.
- B. disregard or ignore information that is inconsistent with their beliefs and attitudes.
- C. process information accurately even if it is inconsistent with their beliefs and attitudes.
- * D. process information to make it consistent with their beliefs and attitudes, and disregard or ignore information that is inconsistent with their beliefs and attitudes.

Conceptual

49. Which of the following concepts is characterized as 'often existing at the pre-conscious level and involving irrational and intuitive thinking as opposed to conscious rational thinking'? (p. 47)

- A. cognitive dissonance
- B. attribution
- C. locus of control
- * D. implicit theory

Conceptual

50. Implicit theories (p. 47)
- A. refer to formal theories that psychologists have developed based on psychological research.
 - * B. refer to personal hypotheses, beliefs, and assumptions that individuals have about the world.
 - C. are rationally derived beliefs that people have developed as a result of their interactions with the world.
 - D. are conscious ideas, beliefs, and values that people use to determine how they should respond to the external world.

Conceptual

51. The term automatic behavior is used to refer to (p. 47)
- A. those behaviors that result from the strengthening of a habit.
 - B. those behaviors that result from reinforcement of random behaviors.
 - C. those behaviors that result from repetition.
 - * D. those behaviors that result from intention and planning.

Conceptual

52. Happiness has been linked to (p. 48)
- A. whether or not the environment is providing us with satisfying rewards.
 - B. attaining the goals that we have set for ourselves.
 - * C. subjective beliefs, attitudes, and implicit theories.
 - D. satisfying basic needs such as hunger and safety needs.

Factual

53. A major problem with early theories of motivation was (p. 49)
- A. their failure to pay attention to biological processes.
 - B. their failure to pay attention to learning processes.
 - C. their failure to pay attention to cognitive processes.
 - * D. their failure to pay attention to individual differences.

Conceptual

54. According to attribution theory (p. 50)
- A. people are inclined to plan their actions.
 - * B. people are inclined to look for explanations of their actions.
 - C. people tend to make excuses for their actions.
 - D. people are inclined to see their actions as caused by events outside themselves.

Factual

55. Nisbett and Schachter's experiment found that subjects given certain information (e. g., that a pill they took would produce autonomic arousal) tolerated shock levels four times as great as those not given that information. These results are thought to illustrate (p. 50)
- A. that cognitive factors do not affect behavior.
 - * B. that cognitive factors do affect behavior.
 - C. that the perception of pain depends entirely upon the physical intensity of the shock.
 - D. that the idea of "mind over matter" has little or no validity.

Conceptual

56. Internals perceive the cause of behavior (p. 50)
- * A. lies within themselves.
 - B. lies outside themselves.
 - C. is caused by learning.
 - D. is caused by thinking.

Factual

57. Differences in _____ are thought to show that people are not equally sensitive to situational cues. (p. 51)
- A. happiness
 - * B. self-monitoring
 - C. self-esteem
 - D. self-efficacy

Conceptual

- W58. Cognitive theory, in contrast to social incentive theory, assumes that behavior results from (p. 51)
- A. seeking approval.
 - * B. intentions.
 - C. conditioning.
 - D. imitation.

Conceptual

59. The example of running illustrates (p. 52-54)
- A. that the motivation for running is far too complex to be understood.
 - B. that people run for purely biological reasons and that when they are asked to account for their behavior they are unable to do so.
 - C. that people only run to escape feelings of depression.
 - * D. that the initial motivation for engaging in a behavior may be quite different from the motivation that maintains that behavior.

Conceptual

60. For those who have had the chance to repeatedly experience the effects of running, which of the following has not been reported to be associated with it? (p. 53-54)
- A. elevation of norepinephrine
 - * B. weakening of the immune system
 - C. decrease in feelings of depression
 - D. increase in feelings of pleasure

Factual