Lecture Notes

# Chapter 14: Individual Differences in Cognition

## Learning Objectives

* Identify some sources of individual differences in cognitive development
* Differentiate between individual differences in abilities, style, learning, expertise, and age
* Compare and contrast gender differences in skills and abilities and learning and cognitive styles

## Outline

**I.** Setting the Stage

**A. Individual differences** are stable patterns of performance that differ qualitatively and/or quantitatively across individuals.

**B.** If people vary systematically in the way that they approach cognitive tasks, then psychologists cannot speak of “the” way cognition works.

**II.** Individual Differences in Cognition

**A.** The word “intelligence” is often used as a term to describe individual differences in performance on cognitive tasks.

**1.** But psychologists still debate just what intelligence is—a capacity to learn, mental speed, mental energy, or mental organization, to name just a few possibilities.

**2.** There are also many different views about what the set of cognitive capacities are.

**3.** When we control for the effects of age, mental ability (as assessed by verbal and nonverbal intelligence tests) still makes a difference in performance of a variety of cognitive tasks.

**4.** A controversial book of 1994, *The Bell Curve,* made a number of assertions that are actually a matter of hot debate in psychology.

**a)** There is one general cognitive ability on which human beings differ.

**b)** IQ scores measure this ability accurately.

**c)** This ability is mostly inherited.

**5.** Howard Gardner’s theory directly contradicts these assumptions.

**a)** Gardner proposed the existence of at least seven distinct “intelligences.”

**b)** Gardner argues that our western culture puts certain kinds of intelligence on a pedestal while ignoring others.

**c)** Gardner’s theory, however, still awaits the development of assessment tools for each type of intelligence.

**B.** The term **cognitive style** refers to presumed individual differences in how people prefer to approach cognitive tasks.

**1.** For example, people identified as “field dependent” have trouble divorcing embedded figures from their context, while people identified as “field independent” find this task relatively easy.

**2.** Another example of cognitive style is “cognitive tempo,” sometimes referred to ask reflectivity/impulsivity, which refers to the extent to which a person delays response in an uncertain situation.

**3.** Cognitive styles do not seem to be easily modified through training.

**4.** Cognitive styles do show developmental differences, with younger children tending to display impulsive and field-dependent styles than older children do.

**5.** Individuals also differ on their “need for cognition,” which means their motivation to take on intellectual challenges, independent of their intellectual ability.

**C.** You may have heard that people with visual learning styles learn better from visual presentations and people with verbal learning styles learn better from verbal presentations.

**1.** Strong evidence for this hypothesis would require that a study divide people into groups based on their learning style, present information to them in either a verbal or visual mode, give the same test to all participants, and show that the learning method that optimizes performance for one learning-style group is different than the optimal method for the second group.

**2.** Such evidence has not yet been obtained for the learning styles hypothesis.

**D.** Expert/novice differences represent another type of individual difference in cognition.

**1.** Given equal exposure to information, experts will perceive more subtle distinctions than novices do.

**2.** Novices classify instances on the basis of superficial similarities, whereas experts use their knowledge to classify on the basis of deeper principles.

**3.** Experts are better able to “chunk” items in memory than novices are.

**E.** Age-related changes in cognition do not end with adolescence, and such changes are of particular interest with respect to older adults (age 60 and older).

**1.** Older adults perform less well on divided attention tasks than younger adults do.

**2.** Older adults show declines in speech recognition, memory performance, and some problem-solving tasks.

**3.** This pattern of results may be generally explained by an age-related decline in the speed of processing of cognitive operations; older adults, however, can strategically compensate for such declines.

**4.** Further, age-related differences in cognitive processing are still subject to individual differences from other sources, so not all older people will perform worse than younger people.

**III.** Gender Differences in Cognition

**A.** Gender differences in cognitive ability remain a topic of controversy in psychology and in society at large.

**1.** Many people in our culture speculate about differences between females and males; however, the term “gender difference” is not always well understood.

**a)** Many people assume that a gender difference means that all members of one sex have higher scores than all members of the other sex, but this type of difference almost never exists in reality.

**b)** Real gender differences tend to indicate that the average member of one sex outperforms the average member of the other sex, but there is considerable overlap between the distributions.

**2.** Further, scientific journals are more likely to publish studies that report significant differences between groups than studies that find no differences; thus, gender differences may be exaggerated in published literature because we don’t know about all the studies in “file drawers” that were never published.

**3.** It is also difficult to avoid experimenter expectancy effects in conducting studies for which strong stereotypes exist about male and female abilities.

**4.** The technique of **meta-analysis** allows us to combine results from many published and unpublished studies, arriving at a measure of effect size known as **d.**

**B.** Overall, cognitive ability differences between women and men tend to be small and not very consistent.

**1.** Gender differences in verbal ability favor females, but the effect size is small overall and has been declining in more recent studies.

**2.** On tasks of mental rotation, males perform better than females, and the effect size is large.

**a)** Studies that allow participants to perform mental rotation tasks without a time limit, however, show no gender difference in accuracy.

**b)** These studies do show that males are reliably faster at such tasks than women are.

**c)** Neurological findings suggest that females tend to have cerebral hemispheres that are less specialized than those of males; males’ greater lateralization may equip them with more resources to deal with specialized spatial tasks such as mental rotation.

**d)** Gender differences in spatial tasks are also dependent on socioeconomic status, with no differences found in the performance of lower-SES students; this may have to do with access to toys that promote spatial skills, such as Legos, puzzles, and video games.

**3.** Boys tend to outperform girls on tests of mathematical ability, particularly among highly achieving students.

**4.** Even for the most highly reliable gender differences, the percentage of individual variability accounted for by gender is only between 1% and 5%.

**C.** Males and females often appear to teachers to have differential aptitudes or preferences, which could be a matter of cognitive style differences rather than ability differences.

**1.** Even in elementary school, boys and girls show different patterns of achievement motivation.

**a)** Faced with negative feedback on an unsolvable task, girls tend to adopt a “helpless” strategy, whereas boys attribute their failure to the evaluator’s “fussiness.”

**b)** In classroom interactions, boys receive 90% of their positive feedback related to the intellectual quality of their work, whereas girls are less likely to receive such positive feedback and more likely to receive negative feedback on the quality of their work.

**c)** Teachers may tend to attribute girls’ successes to effort and their failures to lack of ability; boys, on the other hand, are more often seen as lacking in conduct or effort.

**d)** As a result, boys may learn to be less devastated by criticism and to take it less personally.

**2.** Feminist psychologists believe that men and women approach cognitive tasks differently because of different ways of understanding.

**a)** Women have been described by investigators as seeking connected knowing, involving discovery of personal connections between oneself and the concept under study.

**b)** More typical of males (and also females who are socialized in traditional male environments) is a style known as separate knowing, characterized by objectivity and rigor.

**c)** Little has been done to assess whether such styles are a function of gender as opposed to socioeconomic status, level of education, or other factors.