GLOBAL EDITION

The Journey of Adulthood

EIGHTH EDITION

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ALWAYS LEARNING

PEARSON

The Journey *of* Adulthood

Eighth Edition
Global Edition

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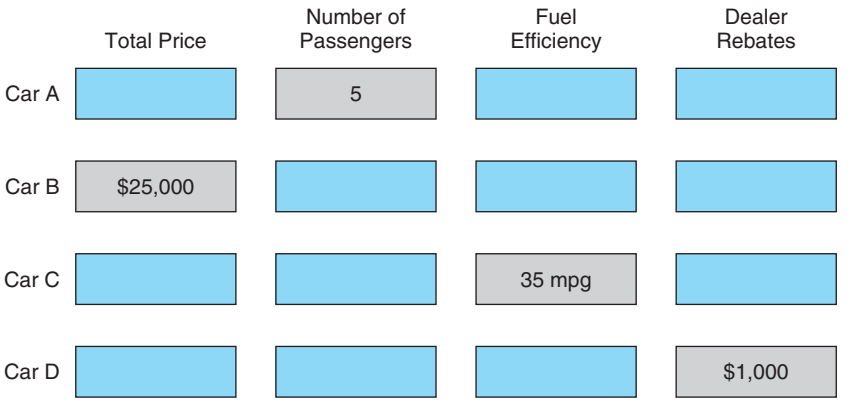

Figure 4.6 Example of a choice board used in studies of decision making. This one includes four factors for each of four car choices.

car will hold, fuel efficiency, and manufacturers' rebates offered for each car. At the beginning, the categories are visible, but the attributes are on cards, placed facedown on the matrix. (Some labs use computer screens.) Participants are told to look at whatever information they need and take the time necessary to make the decision. The cards that the participant turns over, the pattern in which they are turned, and the time each card is studied are all recorded. When the choice-making processes of younger and older adults are compared, we learn something about age differences in this type of judgment and decision making.

Using a choice-board technique, researchers investigated how young adults (mean age 23) and older adults (mean age 68) chose which of six cars to buy after having an opportunity to compare them on nine features. A later study compared the apartment-rental choices of the two groups when five apartments were shown on the choice board with 12 features available for each apartment (Johnson, 1993). Another research group examined decision-making processes of 20-year-olds versus people in their 60s and 70s as they made complex financial decisions (Hershey & Wilson, 1997). In a study of medical-treatment choice, young women, middle-aged women, and older women were compared on their decision-making processes in a simulated situation involving breast cancer treatment (Meyer, Russo, & Talbot, 1995). Although these studies ran the gamut on decision topics, they all had similar results. Basically, older people used less information and took less time than younger people to make their choices. Regardless, there was essentially no difference between the choices made by the two groups.

One possible explanation for these findings is that older people recognize their cognitive limitations and make decisions based on less complex thought processes. However, the fact that their decisions are the same as those of younger people in these studies suggests an alternative explanation. This hypothesis is that older people are experts on making choices such as which apartment to rent, which car to buy, or which medical treatment to undergo. By the time most adults reach the older stage of life, they have gone through these thought processes many times, and they approach them much like a chess master approaching a chess board, using deductive reasoning and tapping their long-term store of experiences. This explanation is supported by the accounts given by some of the participants when asked to "think aloud" while making choices (Johnson, 1993).

These studies affirm that when adults of any age are evaluated in the context of their current lifestyles, interests, and areas of expertise, they show much better cognitive capabilities than on traditional, "one-size-fits-all" laboratory tests.

One interesting finding about problem solving in older adults is that, despite cognitive declines in executive function as I discussed earlier, their ability to regulate their emotions, particularly in the context of problem solving, is often as good as those younger adults (Blanchard-Fields, 2007). In fact, older adults often show better decision-making skills than younger adults, especially when interpersonal problems are confronted. For example, researchers gave younger and older adults problems dealing with interpersonal issues (for instance, "Your parent or child criticizes you for some habit you have that annoys him or her") or nonpersonal issues (for instance, "A complicated form you completed was returned because you misinterpreted the instructions on how to fill it out"). Older adults were more apt to solve the nonpersonal problems using what has been described as a *problem-focused approach* (for example, "Obtain more information on how to complete the form correctly"), but were more likely to use an *avoidant-denial strategy* (for example, "Try to evaluate realistically whether the criticism is valid") for interpersonal problems (Blanchard-Fields, Mienaltowski, & Seay 2007). When participants' problem solving was evaluated in terms of effectiveness, the older adults were rated as more effective than the younger adults, especially for the interpersonal problems. Moreover, the older adults' use of an avoidant-denial strategy was not due to their lack of energy to actively solve problems or the fact that they are too emotional. Instead, "they may effectively recognize that not all problems can be fixed immediately or can be solved without considering the regulation of emotions" (Blanchard-Fields, 2007, p. 27).

In fact, older adults in general show better cognitive performance for emotional than for nonemotional information, with age differences being most apparent for positive emotions (Carstensen, Mikels, & Mather, 2006). One example is a study by psychologists Helene Fung and Laura Carstensen (2003) in which people ranging in age from 20 to 83, were shown advertisements featuring three different types of appeals—emotional, knowledge-related, or neutral. As illustrated in Figure 4.7, the older participants remembered more information from the emotional advertisements than the other two types, and the younger participants remembered more information from the knowledge-related and neutral advertisements. Carstensen and her colleagues suggest that younger people are interested in processing information to acquire knowledge; in contrast, older people are interested in processing information to enhance positive emotions. Unfortunately, most laboratory studies of memory are devoid of emotional content, thus favoring younger participants.

In related research, young (19 to 29 years), middle-aged (41 to 53 years), and older (65 to 85 years) adults were shown a series of positive, negative, and neutral images to examine and remember for later on (Charles, Mather, & Carstensen, 2003). Although the young and middle-aged adults recalled more images overall than the older adults, there was a significant difference in the pattern of performance, which is shown in Figure 4.8. As you can see, the older adults displayed higher levels of performance for the positive images

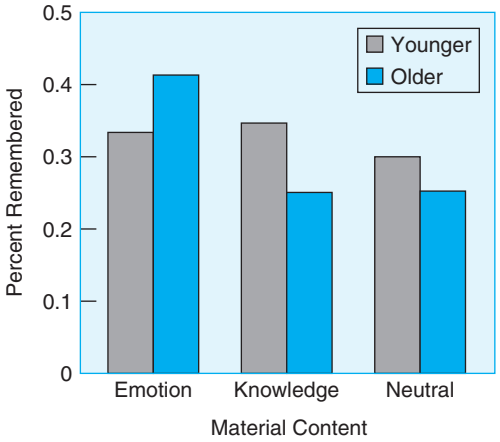

Figure 4.7 Older participants remember more information than younger participants when material has emotional appeal; younger participants remember more when material has knowledge or neutral appeal.

Source: Fung & Carstensen (2003).

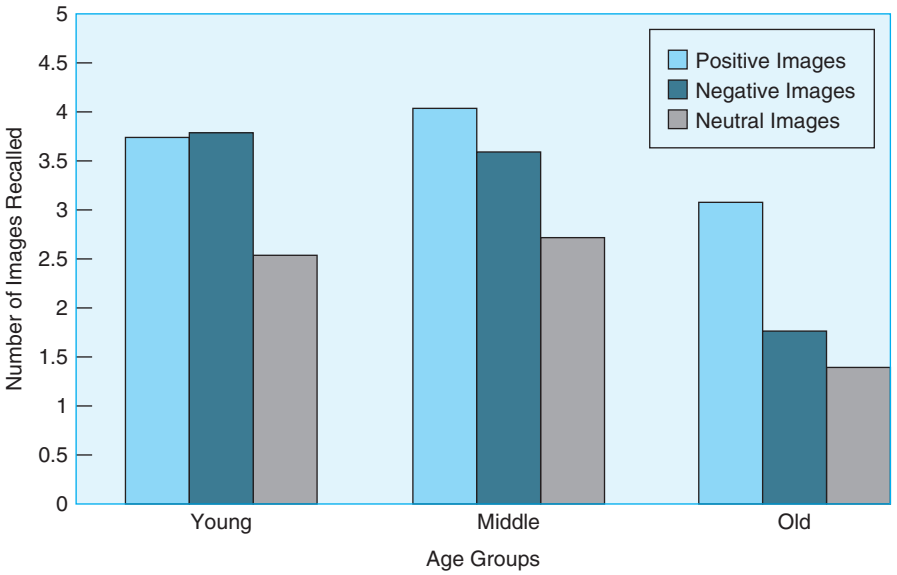

Figure 4.8 The number of positive, negative, and neutral images recalled is a function of age, with older adults showing a distinct positivity bias.

Source: From Charles, Mather, & Carstensen (2003).

compared to the neutral and negative images. Differences in recall between the positive and negative images were smaller or nonexistent for the young and middle-aged adults.

This **positivity bias** is not limited to memory, but has been found in a number of situations (Carstensen & Mikels, 2005). For example, older adults are more apt than younger adults to direct their attention away from negative stimuli (Mather & Carstensen, 2003), have greater working memory for positive than for negative emotional images (Mikels, Larkin, Reuter-Lorenz, et al., 2005), evaluate events in their own lives (positive, negative, and neutral ones) more positively than younger adults (Schryer & Ross, 2012), and are generally more satisfied with the decisions they make than younger adults (Kim, Healey, Goldstein, et al., 2008). In general, older adults are more emotionally positive than younger adults.

One explanation for older peoples' positivity bias is provided by **socioemotional selectivity theory** proposed by Laura Carstensen and her colleagues (Carstensen, Isaacowitz, & Charles, 1999; Carstensen & Mikels, 2005). According to this theory, younger people view time as expansive and tend to focus on the future. As such, they invest their time in new activities with an eye to expanding their horizons. Older people, in contrast, view time as more limited and as a result "direct attention to emotionally meaningful aspects of life, such as the desire to lead a meaningful life, to have emotionally intimate social relationships, and to feel socially interconnected" (Carstensen & Mikels, 2005, p. 118). As a result, they tend to emphasize the positive aspects of experiences and devote more cognitive (and social) effort to them.

Individual Differences in Cognitive Change

If cognitive decline with age were the rule, we would all fade away together in a predictable pattern, showing little variation in change from our age-mates. As you have surely observed in your family or your community, this is not the case; chronological age is only part of the story. Your grandmother and her best friend, Lillian, may be only a few years apart and may have had similar cognitive abilities in early and middle adulthood, but now, in their early 70s, Grandma may be an honor student at the community college

and know the names of all 56 people in her water aerobics class, whereas Lillian needs help balancing her checkbook and making a grocery list. What factors might predict this difference in cognitive change?

Health

As is well known, poor health can affect cognition, but it is important to keep in mind that this is true for people of any age. The reason health is a topic for discussion here is that older adults are more apt to experience health problems that interfere with cognition. Another word of caution is necessary; most of these factors are known only to be predictive of or associated with cognitive change—whether they are causes has not been well established.

Vision and Hearing. My first candidate for markers of cognitive change would be vision and hearing difficulties (Lindenberger & Baltes, 1994; Wingfield, Tun, & McCoy, 2005). We know from Chapter 2 that over a third of people over 65 have hearing impairment, and most have some visual disability. The prevalence of decline in these two sensory systems is further illustrated by psychologists Ulman Lindenberger and Paul Baltes (1994; Baltes & Lindenberger, 1997), who tested the vision and hearing abilities of 156 participants, aged 70 to 103, from the Berlin Study of Aging. Tests of cognitive abilities showed the expected decline with age, but when the vision and auditory evaluations for the participants were added to the equation, the researchers found that these deficits explained 93% of the variance in IQ measures. In a more recent cross-sectional study, older adults' (60 to 82 years of age) auditory working-memory span was more influenced by reductions in the intensity of the spoken stimuli than that of younger adults (18 to 30 years of age; Baldwin & Ash, 2011). The results of this study show age differences in listening memory span as a function of the decibel level of the stimuli. The authors interpreted these findings as pointing to *auditory acuity* as an important factor in older adults' working-memory performance.

Does this mean that vision and hearing loss are responsible for declines in cognitive ability? Not really; it only shows a relationship between sensory abilities and cognitive abilities. The explanation suggested is a *common-cause hypothesis,* meaning that the declines in intellectual abilities and the corresponding declines in sensory abilities are most likely caused by some other factor that underlies them all (Lindenberger & Baltes, 1994; Salthouse, Hancock, Meinz, et al., 1996). The general term for this common factor is "brain aging," and we do not know with certainty what specific mechanisms are involved. The best guess at the moment is age-related changes in the white matter of the brain, which was discussed in more detail in Chapter 2 (Bäckman, Small, & Wahlin, 2001). However, although there seems no doubt that changes in brain structure and function are responsible for corresponding changes in cognition, the relationships are not always straightforward, the effects are often small, and much more research needs to be done to be able to specify how the aging brain is related to cognitive aging (Li, 2012; Salthouse, 2011).

Chronic Disease. The major diseases contributing to cognitive decline are Alzheimer's disease and other dementias, but others have been implicated also, such as obesity combined with high blood pressure (Waldstein & Katzel, 2006), deficiencies of vitamin B_{12} and folic acid, thyroid disease (Bäckman, Small, & Wahlin, 2001), clinical depression (Kinderman & Brown, 1997), and subclinical depression (Bielak, Gerstorf, Kiely, et al.,

2011). Cardiovascular disease accounts for a large proportion of cognitive decline, and it predicts performance on tests of episodic memory and visuospatial skills even when age, education, gender, medication, and mood are controlled for (Emery, Finkel, & Pedersen, 2012; Fahlander, Wahlin, Fastbom, et al., 2000).

Medication. Related to health is another cause of cognitive decline in later adulthood—the medication people take for their chronic conditions. Many drugs have side effects that affect cognitive processes in people of all ages, and some drugs affect older people more strongly because metabolism slows with age. Often these side effects are mistaken for signs of normal aging, such as bodily aches and pains, sleep disturbances, and feelings of sadness and loss. Other drug-related problems that can contribute to cognitive decline in older people are overmedication and drug interactions. Many older people see a number of different doctors, and it is important for each to know what drugs are being prescribed by the others.

Genetics

A factor that undoubtedly underlies many of the health-related differences in cognitive aging is genetics. The strength of genetic influence on a behavior is measured by *heritability scores.* Studies comparing the traits and abilities of pairs of individuals with varying degrees of family relationship have demonstrated that cognitive abilities are among the most heritable of behavioral traits. Meta-analyses of studies involving over 10,000 pairs of twins show that about 50% of the variance in individual IQ scores can be explained by genetic differences among individuals (Plomin, DeFries, McClearn, et al., 2008). Furthermore, researchers report that for general cognitive ability, heritability increases with age, starting as low as 20% in infancy and increasing to 40% in childhood, 50% in adolescence, and 60% in adulthood (McGue, Bouchard, Iacono, et al., 1993).

To find out about the heritability of cognitive abilities in older adulthood, behavioral geneticist Gerald McClearn and his colleagues (McClearn, Johansson, Berg, et al., 1997) conducted a study of Swedish twin pairs who were 80 years of age or older. In this study, 110 identical twin pairs and 130 same-sex fraternal twin pairs were given tests of overall cognitive ability as well as tests of specific components of cognition. As the graph in Figure 4.9 shows, identical twin pairs, who have the same genes, had scores on the tests that were significantly more similar to each other than did fraternal twin pairs, who share

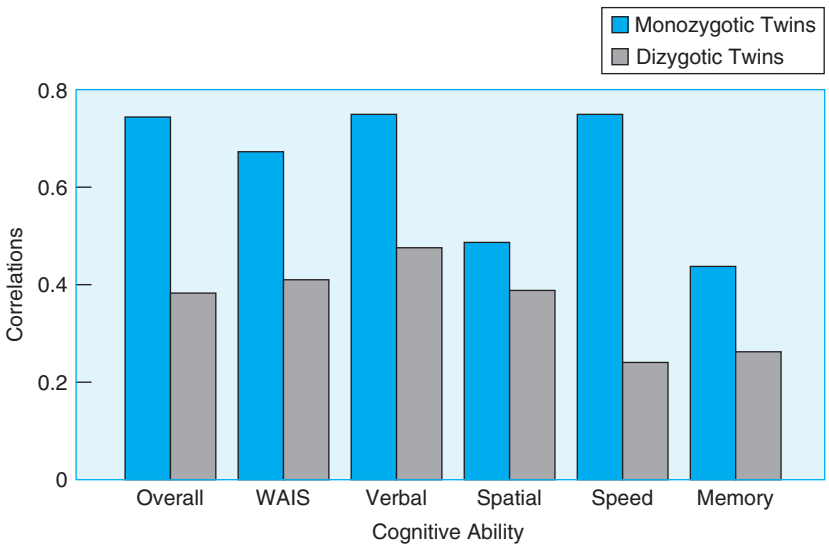

Figure 4.9 Correlations on tests for a number of cognitive abilities are higher for monozygotic twin pairs (who share the same genes) than for dizygotic twin pairs (who share about 50% of their genes), demonstrating significant and separate genetic contributions for those abilities.

Source: McClearn, Johansson, Berg, et al. (1997).

only about half their genes. Because we know that genes are implicated in many diseases and chronic conditions, these findings of a genetic contribution to cognitive decline should come as no surprise.

Another interesting result of this study is the variation in heritability for the different cognitive abilities, ranging from 32% to 62%. Taken together, these findings show not only that cognitive ability is influenced by genetics, but also that different types of cognition are influenced to different extents.

As a final word on this subject, I must point out that even if approximately 60% of the individual differences in general cognitive ability in older adults can be explained by genetics, 40% must be considered environmental in origin. In Figure 4.10, you should note that none of the bars reaches the 100% level. This means that even identical twins with identical genes are not identical in cognitive abilities.

Demographics and Sociobiographical History

Women have a slight advantage over men in several cognitive areas (episodic memory, verbal tasks, and maintaining brain weight), and these gender differences continue into very old age (Bäckman, Small, & Wahlin, 2001). Military service is another factor that predicts levels of cognitive ability in later adulthood. Researchers followed a group of 208 veterans for over 11 years and found that their cognitive abilities declined less than those of a civilian control group, even after education was taken into account, suggesting that military training or service might have some long-term effect on cognitive well-being (McLay & Lyketsos, 2000).

CRITICAL THINKING

Before you read further, guess if a lawyer and a construction worker will have similar rates of cognitive decline in their old ages.

Another set of factors is what Paul Baltes calls **sociobiographical history,** the level of professional prestige, social position, and income experienced throughout one's life. It was once thought that people who had led privileged lives in these respects would be less likely to decline in cognitive abilities as they grew older, but most of the research evidence shows otherwise; the *rate* of decline is the same, regardless of what blessings people have received or earned in their lifetime (Lindenberger & Baltes, 1997; Salthouse, Babcock, Skovronek, et al., 1990). The only difference is that the more privileged individuals usually attain higher levels of cognitive ability, so that even if the rate of decline is equal, their cognitive scores are still higher at every age (Smith & Baltes, 1999).

Schooling

Formal education predicts the rate of cognitive decline with age. All other things being equal, people with fewer years of formal schooling will show more cognitive decline as years go by than will their same-aged peers with more years of formal education. This evidence comes from the repeated finding that better-educated adults not only perform some intellectual tasks at higher levels but also maintain their intellectual skill longer in old age, a pattern found in studies in both the United States (Compton, Bachman, Brand, et al., 2000; Schaie, 1996) and in Europe (Cullum, Huppert, McGee, et al., 2000; Laursen, 1997).

There are several possible explanations of the correlation between schooling and maintenance of intellectual skill. One possibility is that better-educated people remain more intellectually active throughout their adult years. It may thus be the intellectual activity ("exercise" in the sense in which I have been using the term) that helps to maintain the mental skills. Another possibility is that it may not be education per se that is involved here, but underlying intellectual ability, leading both to more years of education and to