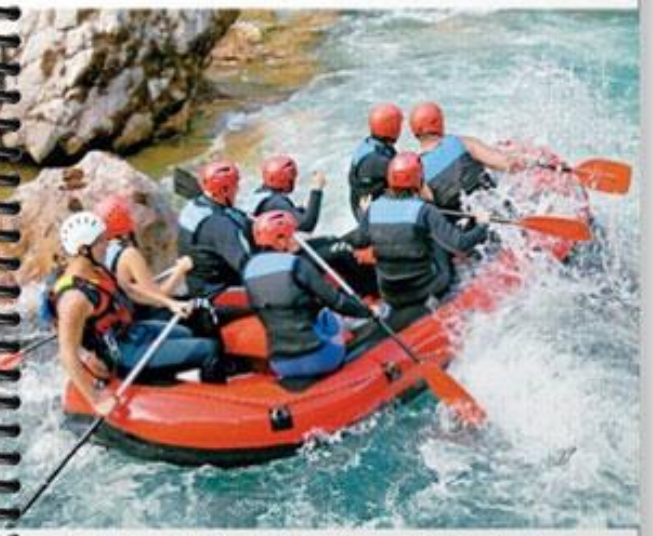
SOLUTIONS MANUAL

The Journey of ADULTHOOD

SIXTH EDITION



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CHAPTER 2
PHYSICAL CHANGES

OUTLINE

Theories of Primary Aging
- Oxidative Damage
- Genetic Limits
- Caloric Restriction
- A Word on Theories of Primary Aging

Physical Changes During Adulthood
- Outward Appearance
- The Senses
- Bones and Muscles
- Cardiovascular and Respiratory Systems
- Brain and Nervous System
- Immune System
- Hormonal System

Changes in Physical Behavior
- Athletic Abilities
- Stamina, Dexterity, and Balance
- Sleep
- Sexual Activity

Individual Differences in Primary Aging
- Genetics
- Lifestyle
- Psychosocial Factors
- Economics

Can We "Turn Back the Clock" of Primary Aging?
An Overview of Physical Changes in Adulthood
Summary
Key Terms
Suggested Reading

BOOKSHELF

Hillman, J. L. (2001). *Clinical perspectives on elderly sexuality (Issues in the practice of psychology).* New York: Springer.

> An interesting foray into clinical psychology as it relates to the counseling of the older adult, this book contains research findings and clinical case studies. The author examines sexuality in institutional settings, sexuality for partners of

older adults with dementia, non-traditional relationships, and information about medications that can cause and aid sexual dysfunction.

Medina, J. J. (1996). The clock of ages: Why we age, how we age, winding back the clock. Cambridge, MA: Cambridge University Press.

This book includes most of the theories and many interesting facts on aging.

Rossi, A. (1994). *Sexuality across the life course.* Chicago: University of Chicago Press.

TOPICS FOR DISCUSSION OR REVIEW

- Theories of Primary Aging. The newer work on telomeres seems very exciting, as does the research on free radicals. Both lines of work offer at least the eventual possibility of genetic engineering to extend the life span still further. If you have taken time to talk about the implications of the current lengthening of life expectancy, it is interesting to extend the discussion to the moral and practical ramifications of an extension of the life span by 20 or 30 percent.

- Sports and Physical Aging. If you are a sports fan, you should be intrigued by the research presented by Schulz, Musa, Staszewski, & Siegler (1994) looking at performance peaks among baseball players in the United States. They analyzed lifetime performances for 388 players who had been active in 1965, dividing the group into subsets of elite (hall-of-famers) and more ordinary players. For both groups, performance rose quickly from age 19, peaked at about age 27, and then declined. The difference between the elite and original players was not only in the level of performance, but how long the peak level was maintained. Among the elite, the peak was maintained longer. Schulz et al. suggest that there are four underlying factors producing the observed curve: physical development, which rises and then falls (including muscle efficiency, VO2 efficiency, and so forth), wear and tear (which operates from the beginning to reduce performance efficiency), experience (which increases steadily and tends to improve performance), and motivation (which stays relatively stable).

- Sensory Changes. It is always interesting to discuss some of the practical applications of the basic physical changes caused by aging on behaviors like driving, since this is something we see illustrated every day. Many young

people will profess a frustration toward older drivers. A discussion of the sensory changes related to aging will help to increase sensitivity to the fact that many small changes in the older person's health or physical status can have a major effect on independence.

Campbell, Bush, & Hale (1993) studied 1656 adults aged 70-96. Of these participants, 275 reported driving in the past but that they do not drive now. Cessation was related to being female, being older, and having any one of six medical conditions: macular degeneration, retinal hemorrhage, any deficit in ADL, Parkinson's disease, stroke-related residual paralysis or weakness, and syncope. These six conditions accounted for half of the variance in cessation.

Marottoli et al. (1993) reported on a group of 1331 older adults followed longitudinally between 1983 and 1989. Of these, 139 stopped driving during the study period. Predictors of cessation included higher age, lower income, not working, neurological disease, cataracts, lower physical activity level, and functional disability. If none of these predictors were present, the elderly did not stop driving. If any one or two predictors were present, 17 percent stopped; if three or more predictors were present, 49 percent stopped.

- Changes in Sexual Activity. The Massachusetts Male Aging Study provides rich and varied information about the male aging process, including information about sexual activity, erectile dysfunction, and prostate disease. This research by McKinlay and Feldman reports that roughly 35 percent of the 40-year-olds report intercourse more than three times a week. This drops fairly steadily to a level of about 10 percent at age 70, while the percentage who report no intercourse rises to nearly 40 percent by age 70. The reference below contains data about sexual function obtained from that study.

- Individual Differences. It is vital to convey to students just how variable the whole process is – far more than is true of the physical changes of childhood and adolescence. Among adults in their 70s, for example, you find some who are experiencing serious loss in almost every area, and some who show little or no physical change except graying, wrinkling, and some loss of speed. Given such a high degree of variability, does it make sense to talk about average changes, or about aging at all?

  A study rich in data to display and discuss is from the MacArthur Research Network on Successful Aging Community Study (Seeman et al., 1994). They have a sample of 1192 adults, aged 70-79, all rated as having good functioning at the start of the study in 1988. So these are the healthiest elders, and even among them there is wide variability. For example, the range of times required for a subject to rise from a chair five times in succession ranged from

five to 20 seconds at the first test where 20 seconds for this item was the upper cutoff point to be eligible for the study. The length of time to sign one's name ranged from four to 30 seconds. In this sample of basically good-functioning older adults, those with better scores on their various tests were more likely to be male, white, better educated, higher income, and with fewer chronic conditions.

- Genetics. McGue et al. (1993) give some numbers for the heritability of longevity. The sample comes from Denmark, and includes 288 pairs of MZ and 383 pairs of DZ twins, born between 1870 and 1880. They found a correlation of .231 between the age at death of MZ twins and .001 for DZ pairs, leading to a heritability estimate of .33. The MZ twins died an average of 14.1 years apart; the DZ twins an average of 18.5 years apart. This is a useful small bit of data, if only because it underlines for your students that heredity, while present as an element in the longevity equation, is overridden by a great many other factors that can affect an individual's health or time of death. If one twin is exposed to asbestos and the other is not, for example, heritability of longevity makes little difference.

REFERENCES FOR CHAPTER TWO

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