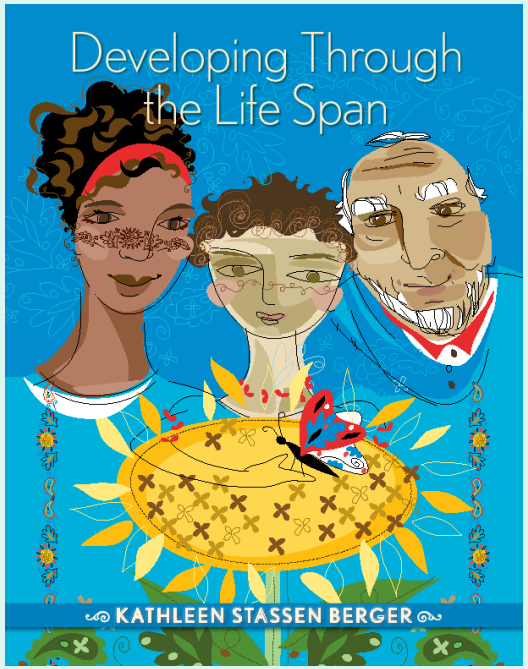
Invitation to the Life Span

by Kathleen Stassen Berger

Chapter 12 – Adulthood (ages25-65): Body and Mind



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Adulthood: Body & Mind

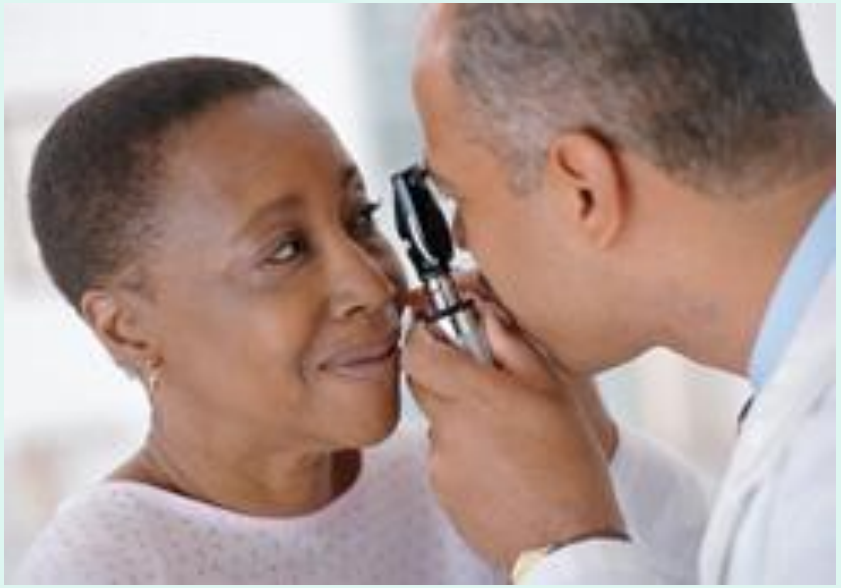
Age matters…

How old are you? Do you feel your age?

The Aging Process

Senescence

- A gradual physical decline that is related to aging and during which the body becomes less strong and efficient. It happens to everyone in every body part but the rate of decline is highly variable



The Aging Process

Physical Appearance

- Collagen decreases by about 1% per year
- By age 30: Skin is becoming thinner and less flexible; wrinkles become visible
- By age 60: All faces are wrinkled
- Hair turns gray and gets thinner
- “Middle-age spread” appears
- Muscles weaken
- Height decreases by late middle age
- Many changes occur more slowly in people who exercise.

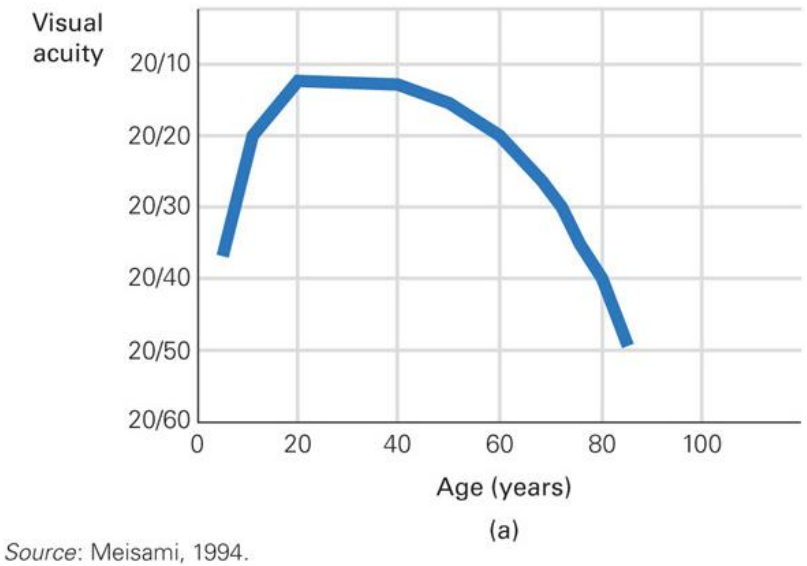
Sense Organs

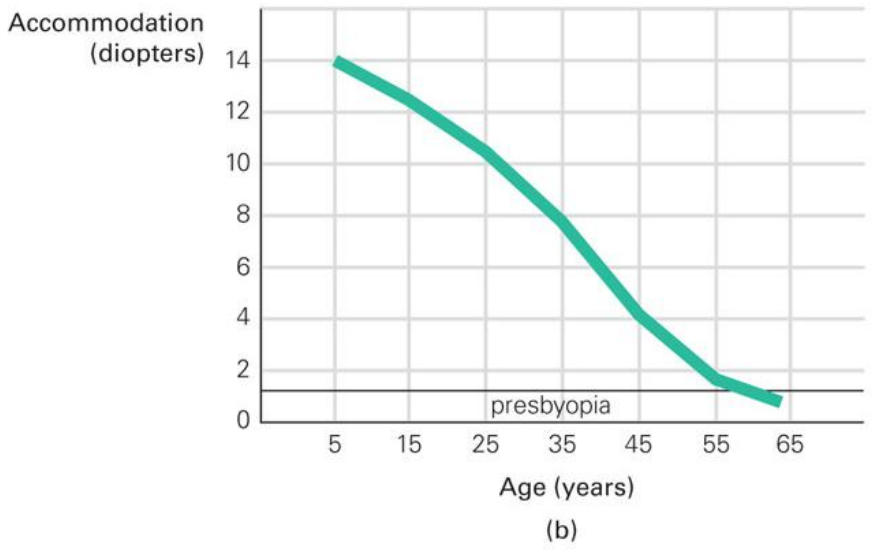
Vision

- Peripheral vision narrows faster than frontal vision
- Color vision shifts from vivid to faded more quickly than does black and white
- *Nearsightedness:* Increases gradually beginning in one's 20s
- *Farsightedness:* Lens of the eye is less elastic and the cornea flattens by middle age
- Younger adults are usually either nearsighted or farsighted; most older adults are both.

The Aging Process

Changes in Aging Vision





Source: Meisami, 1994.

The Aging Process

Hearing

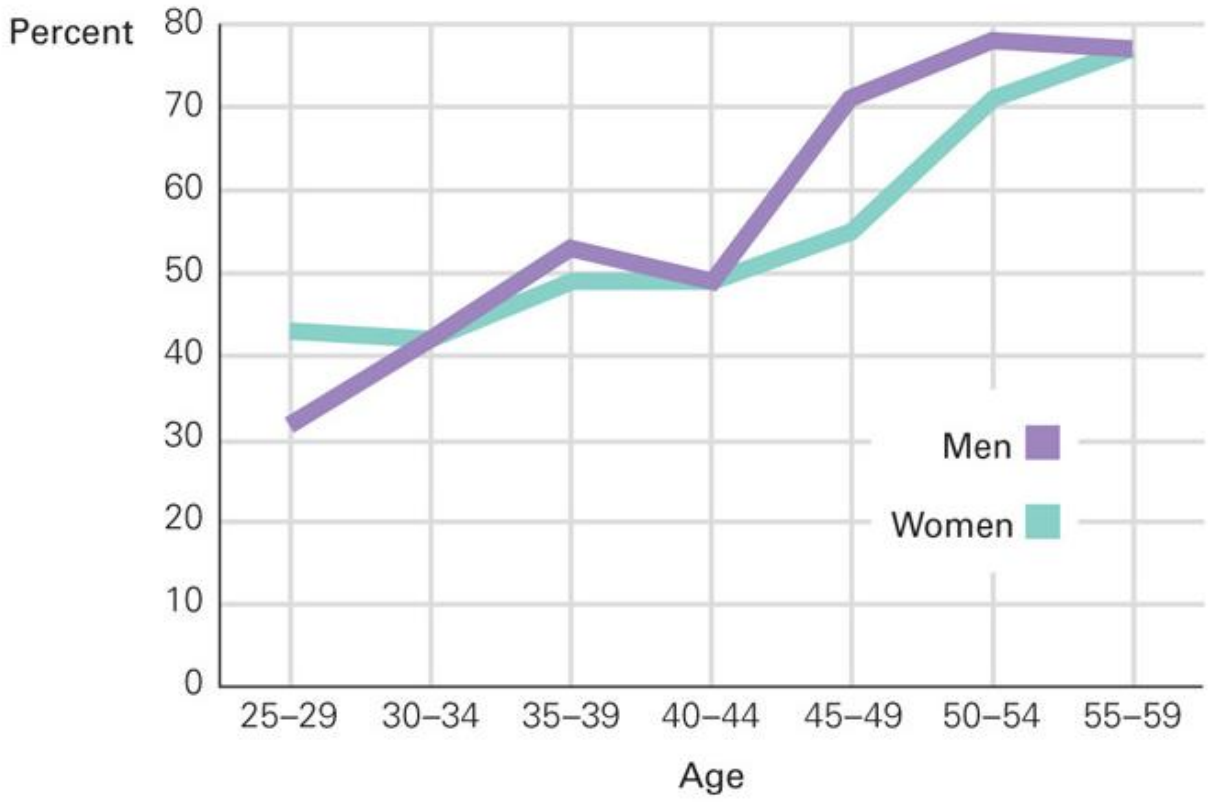
- **Presbycusis:** A loss of hearing that is associated with senescence and that usually does not become apparent until after age 60 but now hearing loss is showing up much sooner, mainly due to environmental factors

The Sexual Reproductive System

Sexual responsiveness

- Sexual arousal occurs more slowly with age, and orgasm takes longer.
- Distress at slower responsiveness is more associated with anxiety, interpersonal relationships, and expectations than with aging itself.
- **Study Findings**:
  - Adults of all ages enjoy “very high levels of emotional satisfaction and physical pleasure from sex within their relationships.”
  - Men and women were most likely to be “extremely satisfied” with sex if they were in a committed, monogamous relationship.

Adults Who Reported That They Were "Comfortable Monogamists"



Source: Laumann & Michael, 2000.

Fertility Issues

- ~~Infertility is most common in nations where medical care is scarce and STIs are common~~.
- United States: 15% of all couples are infertile, partly because many postpone childbearing.
- When couples in their 40s try to conceive, about half are infertile and the other half risk various complications.

Causes of Infertility

Male Fertility:

- Multiple factors (e.g. advanced age, fever, radiation, prescription drugs, stress, environmental toxins, drug abuse, alcoholism, cigarette smoking) can reduce sperm number, shape, and motility.

Female Fertility:

- Affected by anything that impairs physical functioning (e.g. advanced age, diseases, smoking, extreme dieting, obesity).
- *Pelvic inflammatory disease* can block a woman's fallopian tubes, preventing the sperm from reaching an ovum.

Causes of Infertility

Assisted Reproductive Technology (ART)

- Advances in medicine have solved about half of all fertility problems.
- ART overcomes obstacles such as a low sperm count and blocked fallopian tubes.

In vitro fertilization (IVF)

- A technique in which ova (egg cells) are surgically removed from a woman and fertilized with sperm in a laboratory. After the original fertilized cells (the zygotes) have divided several times, they are inserted into the woman's uterus

Menopause and HRT

Menopause

- The time in middle age (around age 50) when a woman's menstrual periods cease completely and the production of estrogen, progesterone, and testosterone drops considerably. Menopause is dated to one year after a woman's last menstrual period.

Hormone replacement therapy (HRT)

- Treatment to compensate for hormone reduction at menopause or following surgical removal of the ovaries. Such treatment, which usually involves estrogen and progesterone, minimizes menopausal symptoms and diminishes the risk of osteoporosis in later adulthood.
- HRT may involve health risks.

Andropause

Andropause (male menopause)

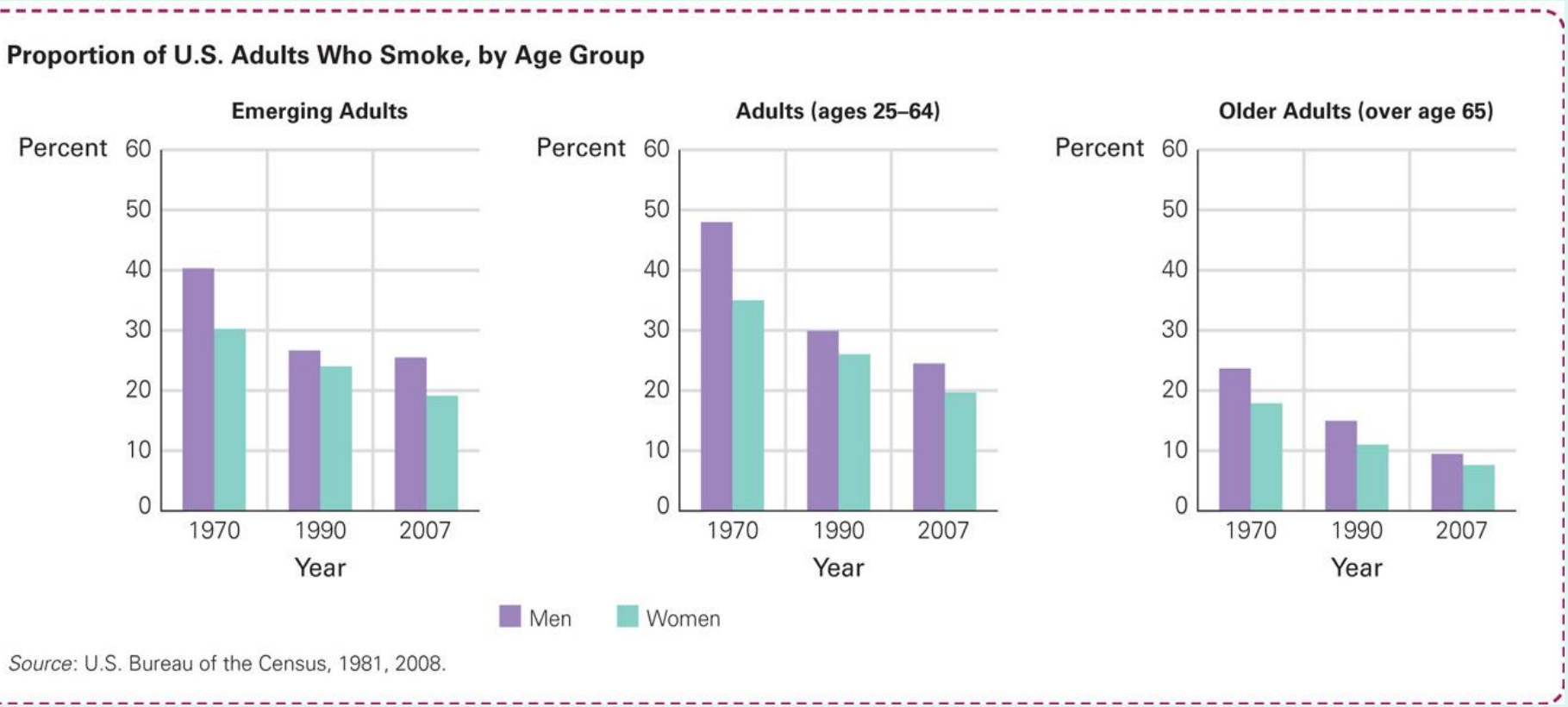
- A term coined to signify a drop in testosterone levels in older men, which normally results in a reduction in sexual desire, erections, and muscle mass. A more gradual decline than menopause.
- Effectiveness of HRT are questionable.

DRUG ABUSE

Tobacco

- *Notable declines in cigarette smoking in the United States over the past 50 years*.
- Worldwide trends are less encouraging.
  - Smoking rates in developing nations are rising.
  - Smoking-related cancers throughout the world are increasing.
- Variations among nations, cohorts, and the sexes indicate that smoking is affected by social norms, laws, and advertising.

DRUG ABUSE (smoking)



Alcohol

Drinking in moderation

- Drinking in moderation (**no more than <u>two</u> drinks a day**) increases life expectancy.
- Alcohol reduces coronary heart disease and strokes.
- Increases “good” cholesterol and reduces “bad” cholesterol (mainly red wine)
- Lowers blood pressure.

Alcohol

Heavy Drinking

- Increases the risk of violent death and is **implicated** in 60 diseases.
- Stark international variations in alcohol abuse.
- Binge drinking signals a problem: About 20% of U.S. adults had five or more drinks on a single occasion in the past year.
- Disproportionate burden of harm in poorer countries because prevention and treatment strategies have not been fully established.

Poor Health Habits and Senescence

Overeating

- Many adults choose high-calorie, low-nutrient foods.
- Only 27% of U.S. adults eat three daily servings of vegetables.
- Too **many high-calorie foods** combined with too **little activity** leads to **obesity**.
- Excess weight increases the risk of **every** chronic disease (e.g. diabetes).

Poor Health Habits and Senescence

United States Facts:

- ***Highest rates of obesity and type II diabetes***
- ***66% of U.S. adults are overweight; of those, 33% are obese and 5% are morbidly obese***
- Metabolism decreases by one-third between ages 20 and 60.
- Genetics: Two alleles that correlate with both diabetes and weight
- Increase in obesity rates cannot be blamed on genes → **cultural influences are more important!**

TABLE 12.1 Body Mass Index (BMI)

To find your BMI, locate your height in the first column, then look across that row. Your BMI appears at the top of the column that contains your weight.

BMI	19	20	21	22	23	24	25	26	27	28	29	30	35	40
Height (in feet and inches)	**Weight** (in pounds)													
4'10"	91	96	100	105	110	115	119	124	129	134	138	143	167	191
4'11"	94	99	104	109	114	119	124	128	133	138	143	148	173	198
5'0"	97	102	107	112	118	123	128	133	138	143	148	153	179	204
5'1"	100	106	111	116	122	127	132	137	143	148	153	158	185	211
5'2"	104	109	115	120	126	131	136	142	147	153	158	164	191	218
5'3"	107	113	118	124	130	135	141	146	152	158	163	169	197	225
5'4"	110	116	122	128	134	140	145	151	157	163	169	174	204	232
5'5"	114	120	126	132	138	144	150	156	162	168	174	180	210	240
5'6"	118	124	130	136	142	148	155	161	167	173	179	186	216	247
5'7"	121	127	134	140	146	153	159	166	172	178	185	191	223	255
5'8"	125	131	138	144	151	158	164	171	177	184	190	197	230	262
5'9"	128	135	142	149	155	162	169	176	182	189	196	203	236	270
5'10"	132	139	146	153	160	167	174	181	188	195	202	207	243	278
5'11"	136	143	150	157	165	172	179	186	193	200	208	215	250	286
6'0"	140	147	154	162	169	177	184	191	199	206	213	221	258	294
6'1"	144	151	159	166	174	182	189	197	204	212	219	227	265	302
6'2"	148	155	163	171	179	186	194	202	210	218	225	233	272	311
6'3"	152	160	168	176	184	192	200	208	216	224	232	240	279	319
6'4"	156	164	172	180	189	197	205	213	221	230	238	246	287	328
			Normal					Overweight				Obese		

Source: National Heart, Lung, and Blood Institute, n.d.

Poor Health Habits and Senescence

Inactivity

- Regular physical activity at every stage of life protects against serious illness.
- Sitting for long hours correlates with almost every unhealthy condition.
- Even a little movement helps but more intense exercise (e.g. swimming, jogging, bicycling) is ideal.
- The connection between exercise and health is causal: People who are more fit are likely to resist disease and to feel healthier as they age.

Poor Health Habits and Senescence

Factors that prevent a decline in exercise:

- ***Friendship:*** People exercise more if their friends do.
- ***Communities:*** Adults exercise more in neighborhoods with walking and biking paths, ample fields and parks, and subsidized pools and gyms.

Measuring Health

MORTALITY AND MORBIDITY

Mortality

- Death: Mortality usually refers to the number of deaths each year per 1,000 members of a given population.

Morbidity

- Disease: Morbidity refers to the rate of diseases of all kinds—physical and emotional, acute (sudden), chronic (ongoing), and fatal—in a given population.

DISABILITY AND VITALITY

Disability

- Long-term difficulty in performing normal activities of daily life because of some physical, emotional, or mental condition.

Vitality

- A measure of health that refers to how healthy and energetic—physically, emotionally, and socially—an individual actually feels.

Variations in Health

Gender Differences

- Mortality is lower for women.
- Women live five years longer than men (significant national variations).
- Old women outnumber old men because more younger men and boys die (sex ratio favors boys at birth, 51% to 49%, is about equal at age 20, and tilts toward women from then on).
- Gender difference might be biological (protective second X chromosome or extra estrogen) or cultural (women tend to have more friends and take better care of themselves).

Variations in Health

Women may suffer more on other measures of health:

- Both sexes **notice superficial signs** of aging in **women** more than in men.
- Women have **higher rates of depression** than men.
- Women have higher rates of morbidity for every. chronic disease except heart disease in middle age (recent studies show gap is closing)
- Women are more often disabled.

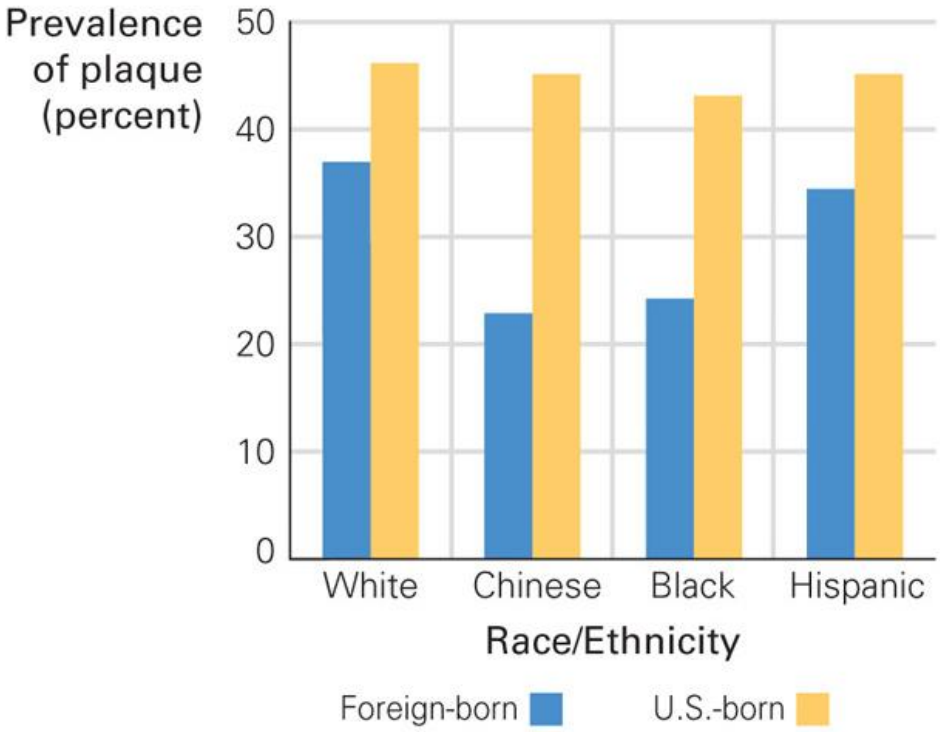
Variations in Health

Socioeconomic Status and Health

- Well-educated, financially secure adults live longer.
- Suspected reasons:
  - Education teaches healthy habits.
  - Education leads to higher income, which allows better housing and medical care.
  - Education may be a marker for intelligence, which is a protective factor.

~~Culture and Health~~

Risk of Heart Attack in U.S. Immigrants and Native-Born Americans



Source: Lutsey et al., 2008.

Cognition in Adulthood
The Aging Brain

Difficulty With Multitasking

- Reactions take longer and complex memory tasks become increasingly difficult because of age-related brain changes.
- Multitasking becomes more difficult with every passing decade (e.g. driving while talking on a cell phone).
- Distractions (e.g. noisy conversations, emotional stress) become more difficult to ignore.

Cognition in Adulthood
The Aging Brain

The Need for Sleep

- Regular sleep is increasingly essential for proper brain functioning.
- Skipping a night's sleep slows down cognitive functions (e.g. memory).
- Disrupted sleep is characteristic of aging and can cause serious problems.

Cognition in Adulthood
The Aging Brain

Serious Brain Confusion

- Dementia is uncommon in individuals under age 65 (less than 1% are affected).

Several lifestyle factors make brain loss more common:

1. ***Drug abuse:*** Alcohol, cigarettes, and psychoactive drugs (including prescription pain relievers) can severely effect the brain
2. ***Excessive stress:*** May lead to depression, an overactive immune system, and harm to the brain

Cognition in Adulthood
The Aging Brain

3. ***Poor circulation:*** Everything that protects the circulatory system (e.g. exercise, a healthy diet, and low blood pressure) **also protects the brain**.
4. ***Viruses:*** Some viruses and infections cross the blood-brain barrier and harm the brain (e.g. HIV, and the prion that causes mad cow disease).

Important: Past education, <u>current intellectual activity</u>, exercise, and overall health all promote brain function!

Research on Age and Intelligence

General intelligence (g)

- A construct based on the idea that intelligence is **one basic trait** that involves all cognitive abilities, which people possess in varying amounts.
- Cannot be measured directly but be inferred from various abilities (e.g. vocabulary, memory, and reasoning).
- Many scientists are trying to find one common factor (genes, early brain development, or some specific aspect of health) underlies IQ.

Research on Age and Intelligence

Cross-Sectional Research

- U.S. Army: Tested the aptitude of all literate draftees during World War I.
  - Intellectual ability peaked at about age 18, stayed at that level until the mid-20s, and then began to decline.
- Classic study of 1,191 individuals, aged 10 to 60, from 19 New England villages.
  - IQ scores peaked between ages 18 and 21 and then gradually fell, with the average 55-year-old scoring the same as the average 14-year old.

Research on Age and Intelligence

Longitudinal Research

- Longitudinal data found **many intellectual gains through adulthood** but younger cohorts often better than older cohorts.
- Probably due to changes in the environment (more education, improved nutrition, smaller family size, fewer infections) and **NOT** changes in innate intelligence!
- **Longitudinal research is better than cross-sectional research** but also has problems (e.g. practice effects, high attrition rates).

Research on Age and Intelligence

Cross-Sequential Research: Combines both cross-sectional and longitudinal designs.

- ***Seattle Longitudinal Study*:**
  - Cross-sequential study of adult intelligence
  - Schaie began this study in 1956; the most recent testing was conducted in 2005.
  - 500 adults, aged 20 to 50, were tested on five primary mental abilities.
  - New cohort was added and followed every 7 years.

Research on Age and Intelligence

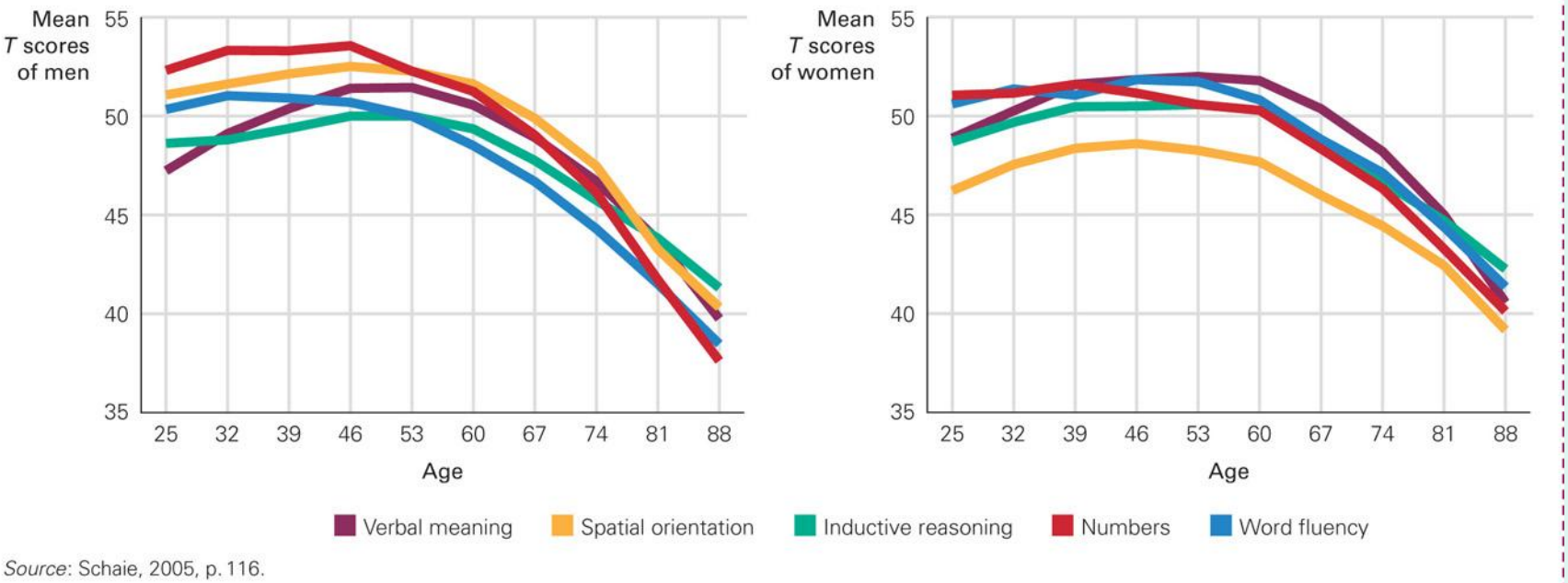
Measures in the Seattle Longitudinal Study

1. verbal meaning (comprehension)
2. spatial orientation
3. inductive reasoning
4. number ability
5. word fluency (rapid associations)

Findings

- **People improve in most mental abilities during adulthood** and decline occurs later in life (after age 65).
- Each particular ability has a distinct pattern for each gender.

Research on Age and Intelligence



Source: Schaie, 2005, p. 116.

Components of Intelligence

Two Clusters: Fluid and Crystallized (Cattell)

Fluid intelligence

- Those types of basic intelligence that make learning of all sorts quick and thorough. Abilities such as working memory, abstract thought, and speed of thinking are usually considered aspects of fluid intelligence.

Crystallized intelligence

- Those types of intellectual ability that reflect accumulated learning. Vocabulary and general information are examples.

Components of Intelligence

Three Clusters: Analytic, Creative, and Practical (Sternberg)

Analytic intelligence

- Valuable in high school and college, as students are expected to remember and analyze various ideas.

Creative intelligence

- Allows people to find a better match to their skills, values, or desires.

Practical intelligence

- Useful as people age and need to manage their daily lives.

Components of Intelligence

Nine Clusters: Cultural Variations (Gardner)

- Linguistic, logical-mathematical, musical, spatial, bodily-kinesthetic, naturalistic, social understanding (interpersonal intelligence), self-understanding (intrapersonal intelligence), and existential intelligence
- Each culture stresses a different set of Gardner's nine types of intelligence.
- **Everyone has all nine** to some extent, but **each person develops only some of them**.

Selective Gains and Losses

Selective Optimization with Compensation

- Theory that people try to maintain a balance in their lives by looking for the best way to compensate for physical and cognitive losses and to become more proficient in activities they can already do well (Paul and Margaret Baltes, 1990).

Expertise

Selective expert

- Someone who is notably more skilled and knowledgeable than the average person about whichever activities are **personally meaningful**.

Expertise

- Culture and context guide expertise.
- Experts are more skilled, proficient, and knowledgeable at a particular task than the average person, especially a novice (literally, “a new person”) who has not practiced that skill.
- Experts do not necessarily have extraordinary intellectual ability.

Characteristics of Expert Thought

Expertise is intuitive

- Experts rely on their past experiences and on immediate contexts; their actions are more intuitive and less stereotypic.
- Novices follow formal procedures and rules.

Expertise is automatic

- Experts process incoming information more quickly and analyze it more efficiently than non-experts; then they act in well-rehearsed ways that appear unconscious.

Characteristics of Expert Thought

Expertise is strategic

- Experts have more and better strategies, especially when problems are unexpected.

Expertise is flexible

- Experts are creative and curious, deliberately experimenting and enjoying the challenge when things do not go according to plan.