Development

Objectives

1. **Major stages of prenatal development**
2. **Newborns and their reflexes**
3. **Timing and stages of motor and language development in children.**
4. **Piaget's stages of cognitive development and recent findings regarding children's cognitive development**
5. **Identity formation**
6. **Physical, cognitive, and "focus" changes with age.**

Progress Before Birth: Prenatal Development

3 Phases:

- **Germinal Stage = first 2 weeks**
  - conception, implantation, formation of placenta
- **Embryonic Stage = 2 weeks – 2 months**
  - formation of vital organs and systems
- **Fetal Stage = 2 months – birth**
  - bodily growth continues, movement capability begins, brain cells multiply
  - age of viability

(adapted from Thomson Higher Education, 2007, 2001)

Prenatal Development

- **Germinal stage** – The first phase of prenatal development, encompassing the first two weeks after conception
  - A zygote is created through fertilization and becomes a microscopic mass of multiplying cells that migrates along the mother's fallopian tube to the uterine cavity.
  - On about the seventh day, the cell mass begins to implant itself in the uterine wall.
  - During the implantation process, the placenta begins to form.
    - **Placenta** – A structure that allows oxygen and nutrients to pass into the fetus from the mother's bloodstream and bodily wastes to pass out to the mother

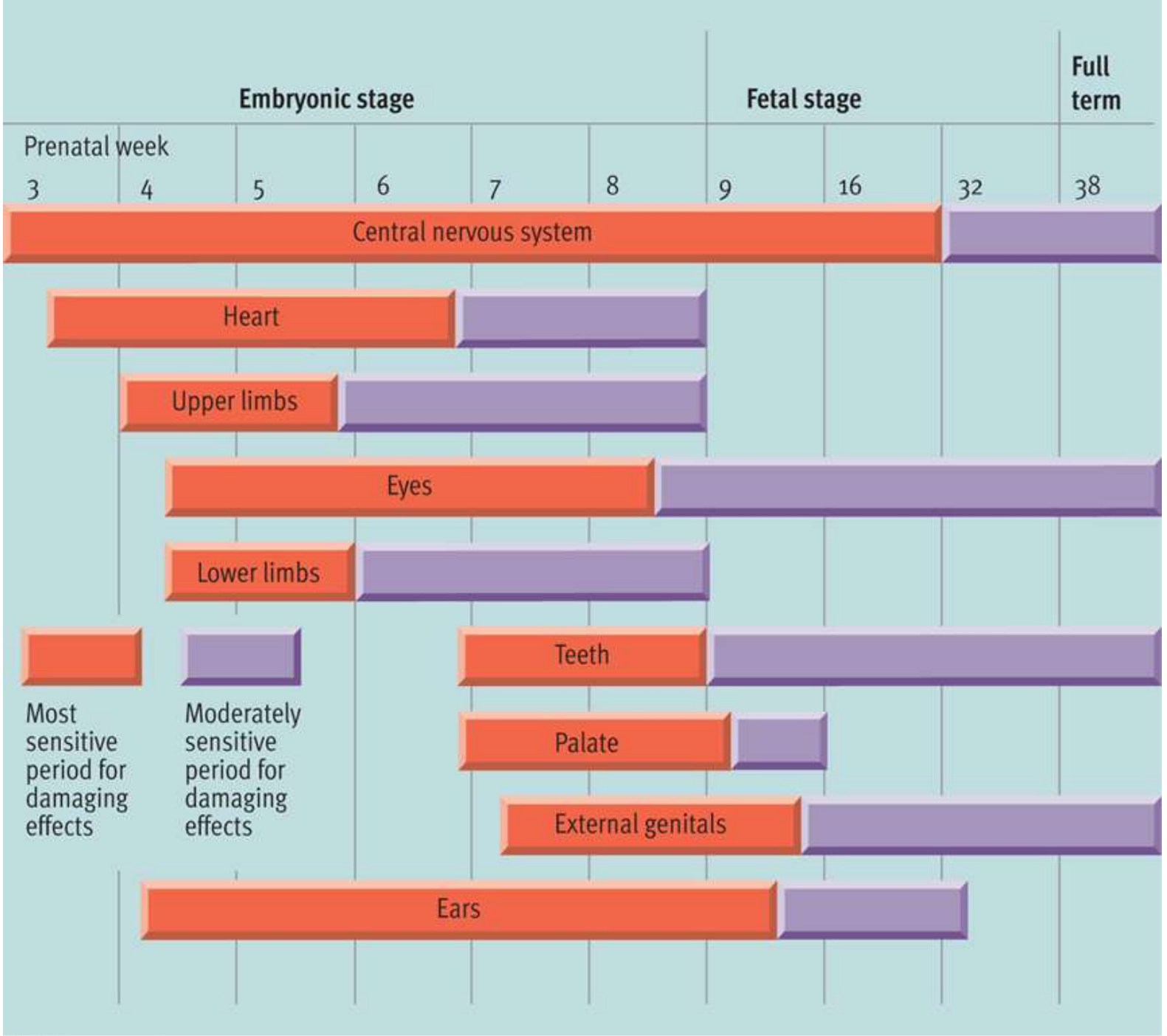
(Cengage, 2019)

Prenatal Development

- **Embryonic stage** – The second stage of prenatal development, lasting from two weeks until the end of the second month
  - Most of the vital organs and bodily systems begin to form.
  - Arms, legs, hands, feet, fingers, toes, eyes, and ears are discernible.

- **Fetal stage** – The third stage of prenatal development, lasting from two months through birth
  - The first two months of the fetal stage bring rapid bodily growth, as muscles and bones begin to form.
  - Organs continue to grow and gradually begin to function.
  - During the final three months, brain cells multiply at a brisk pace, a layer of fat is deposited under the skin to provide insulation, and the respiratory and digestive systems mature.

(Cengage, 2019)



Environmental Factors and Prenatal Development

Nutrition

- A fetus needs a variety of essential nutrients.
- Poor nutrition increases the risk of birth complications and neurological deficits.

Stress and Emotion

- A mother's emotional reactions to stressful events can disrupt the delicate hormonal balance that fosters healthy prenatal development.

Drug Use

- Most drugs pass through the placenta.
- Recreational drugs, prescription medicine, and tobacco can cause problems for fetuses and newborns.

(Cengage, 2019)

Environmental Factors and Prenatal Development

Alcohol Consumption

- Alcohol consumption during pregnancy carries serious risks.
  - **Fetal alcohol syndrome** – A collection of congenital (inborn) problems associated with excessive alcohol use during pregnancy

Maternal Illness

- The placenta screens out many infectious agents.
- Diseases and HIV can be transmitted to a fetus and cause damage.

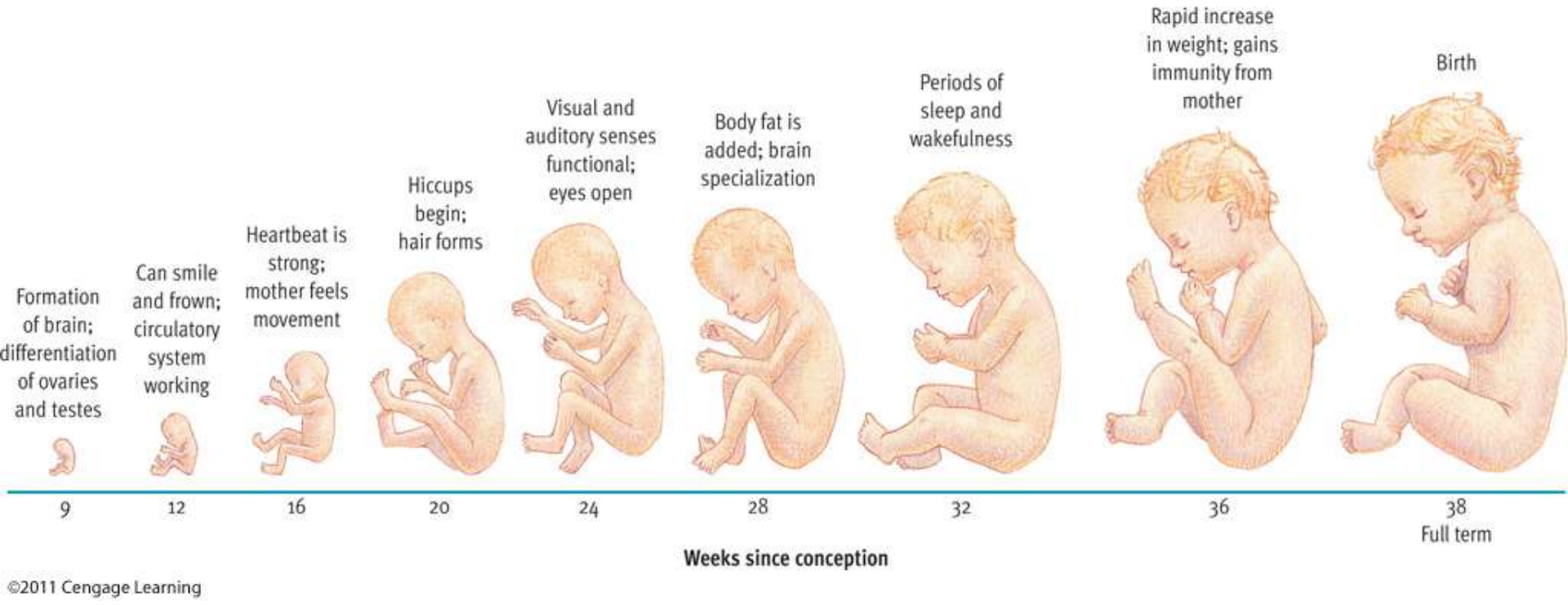
Environmental Toxins

- Exposure to environmental toxins can cause impairments.

Fetal Origins of Adult Disease

- Events during prenatal development can cause vulnerabilities decades later.

(Cengage, 2019)



(adapted from Thomson Higher Education, 2011)

Newborns and Their Reflexes

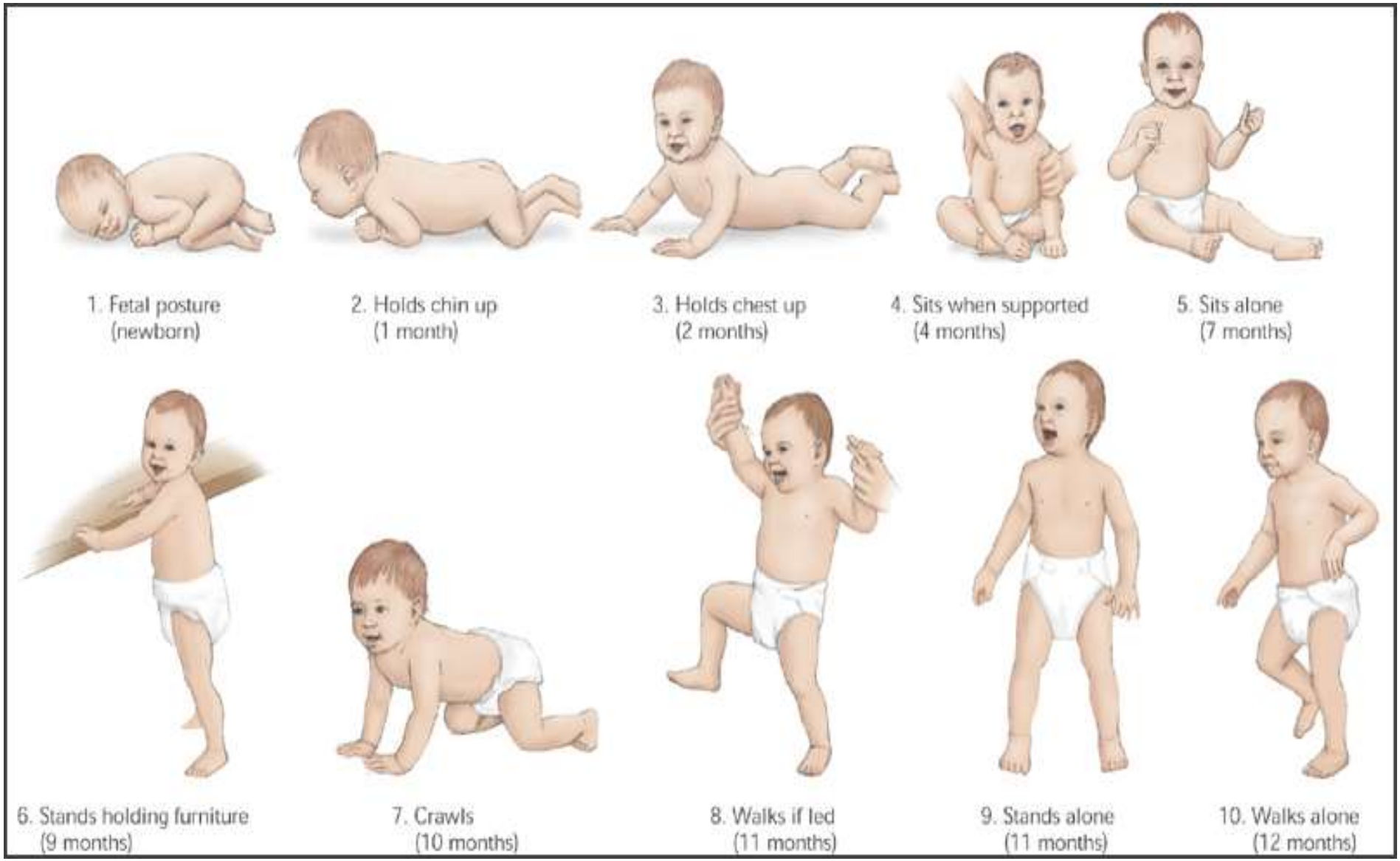
- **Grasping Reflex**: If object placed in infant's palm, she'll grasp it automatically (all reflexes are automatic responses i.e. they come from nature, not nurture)

- **Rooting Reflex**: Lightly touch infant's cheek and she'll turn towards object and attempt to nurse; helps find food

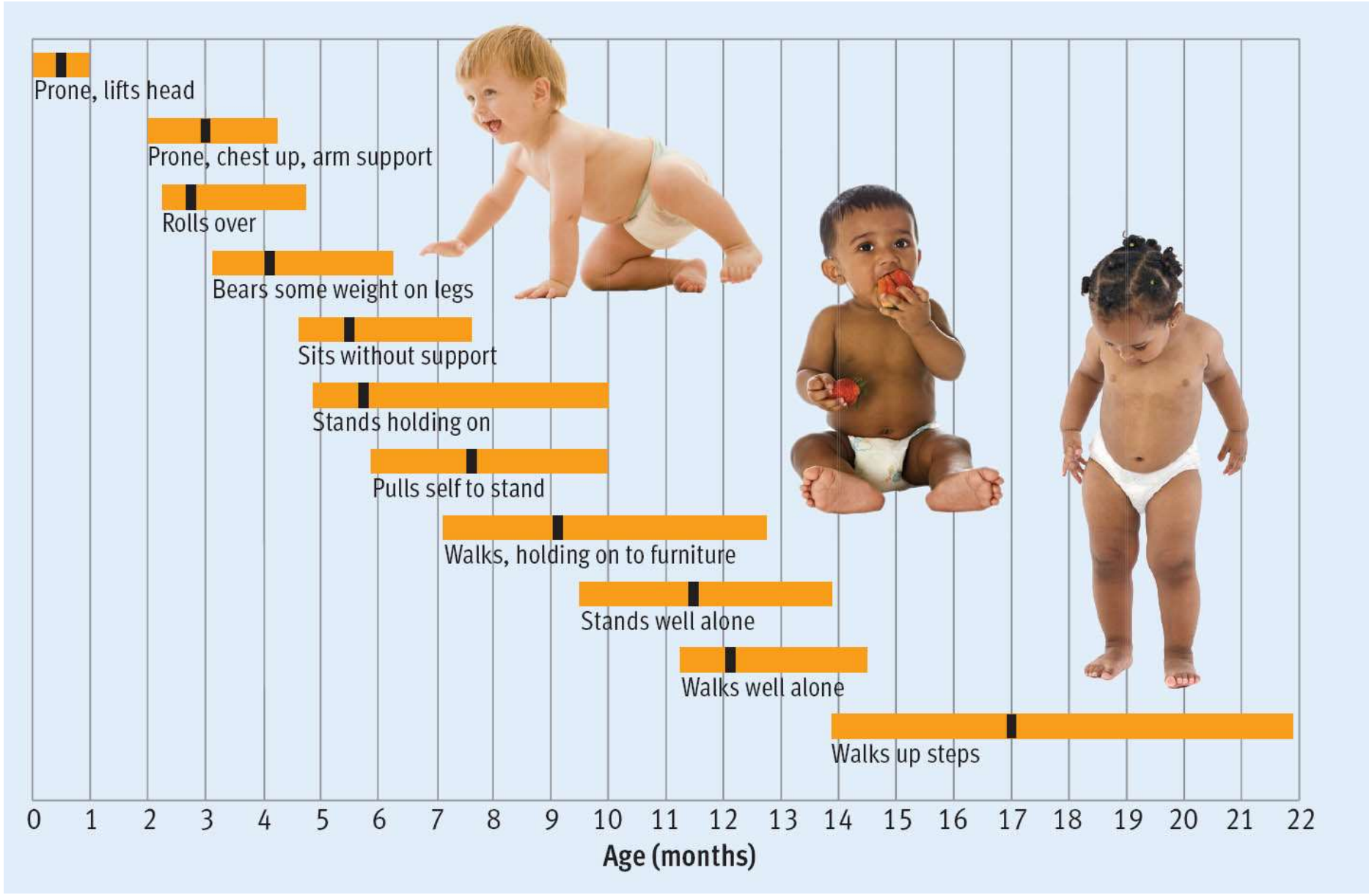
- **Sucking Reflex**: Touch object to infant's mouth and she'll make rhythmic sucking movements.

(adapted from Wadsworth/Thomson Learning, 2001)

Newborn to Toddler: Motor Development



(adapted from Wadsworth/Thomson Learning, 2001)



(Cengage, 2019)

Language Development: Milestones

- Initial vocalizations similar across languages
  - Crying, cooing, babbling
- 6 months – babbling sounds begin to resemble surrounding language
- 1 year – first word
  - similar cross-culturally – words for parents
  - receptive vs. expressive language

(adapted from Wadsworth/Thomson Learning, 2001)

Language Development: Milestones Continued

- 18-24 months – vocabulary spurt
  - fast mapping
  - over and underextensions

- End of second year – combine words
  - Telegraphic speech
  - Mean Length of Utterance (MLU)

- End of third year – complex ideas, plural, past tense
  - Overregularization

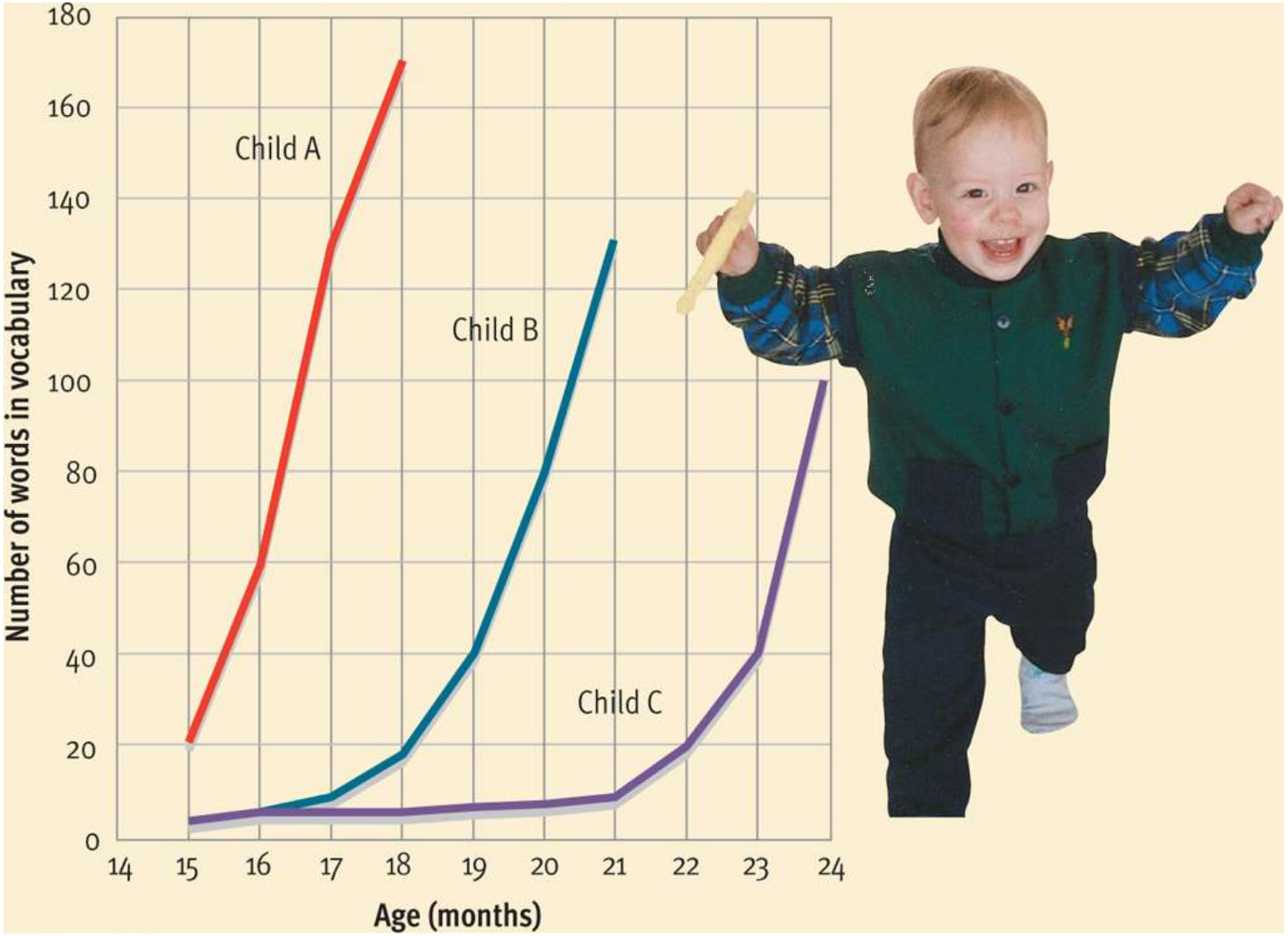
(adapted from Wadsworth/Thomson Learning, 2001)

Learning to Communicate: Language Development

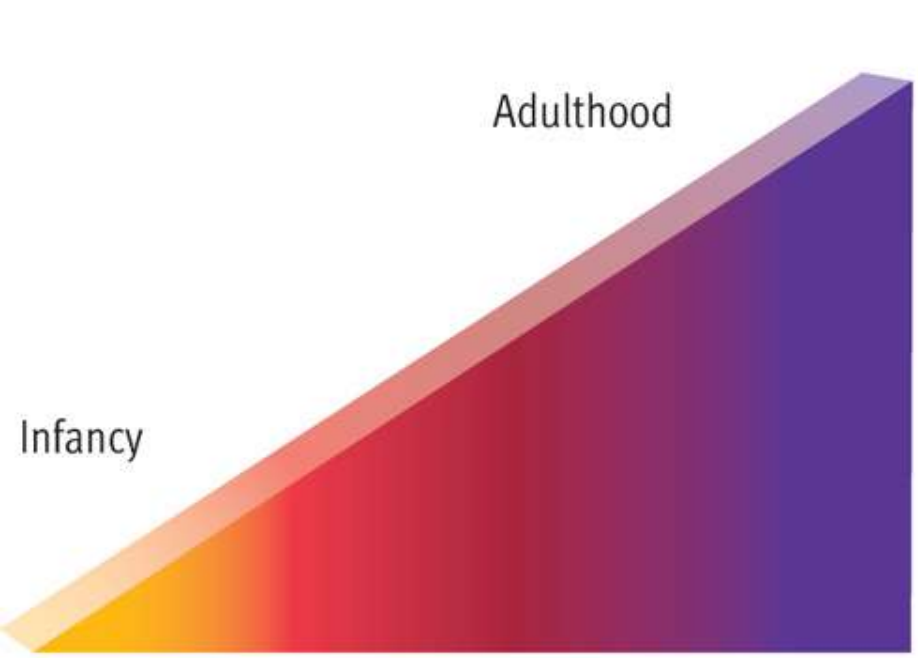
- Language development is determined by biological maturation.
- Toddlers typically can say between three and fifty words by 18 months.
- **Fast mapping** – The process by which children map a word onto an underlying concept after only one exposure
- **Overextension** – Mistake in language learning that occurs when a child incorrectly uses a word to describe a wider set of objects or actions than it is meant to
- **Underextension** – Mistake in language learning that occurs when a child incorrectly uses a word to describe a narrower set of objects or actions than it is meant to
- **Telegraphic speech** – A child's early sentences, which consist mainly of content words; articles, prepositions, and other less critical words are omitted
- **Overregularization** – Mistake in language learning that occurs when a child incorrectly generalizes grammatical rules to irregular cases where they do not apply

(Cengage, 2019)

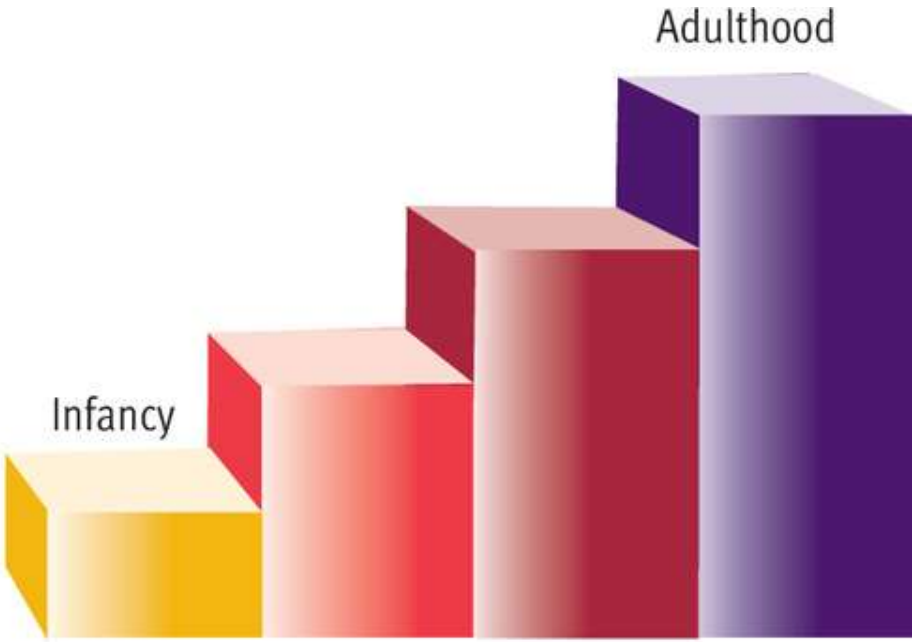
The vocabulary spurt. Children typically acquire their first 10–15 words very slowly, but they soon go through a vocabulary spurt—a period during which they rapidly acquire many new words. The vocabulary spurt usually begins at around 18–24 months, but children vary, as these graphs of three toddlers' vocabulary growth show. (Adapted from Goldfield & Reznick, 1990)



(adapted from Thomson Higher Education, 2011)



Continuous development



Discontinuous development (stages)

(adapted from Thomson Higher Education, 2011)

Jean Piaget and Cognitive Development

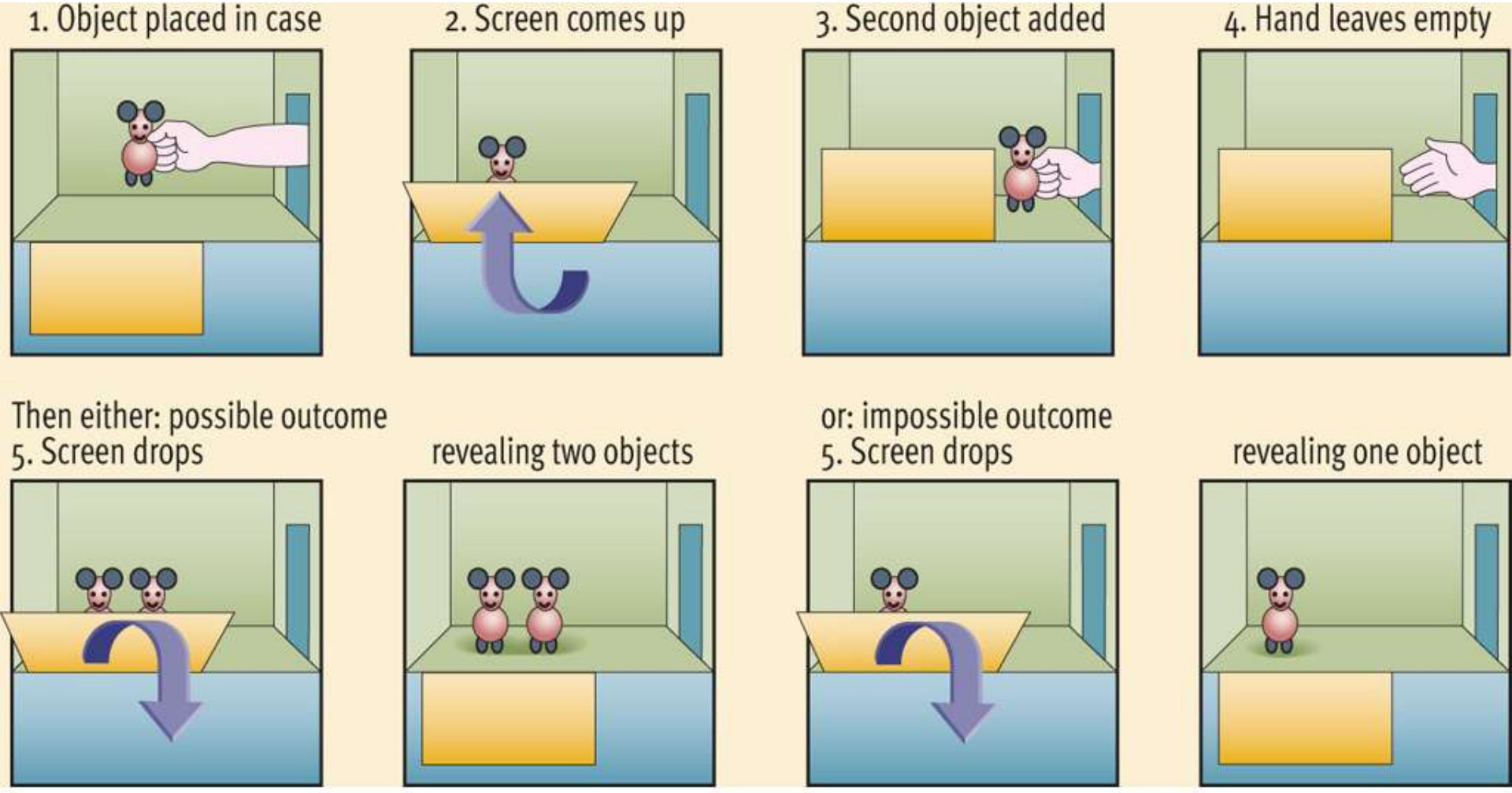
Piaget believed that all children pass through a series of 4 stages during cognitive or mental development

Example of Tasks

Jean Piaget: Stages of Cognitive Development

- **Sensorimotor** (0-2 Years): All sensory input and motor responses are coordinated; most intellectual development here is nonverbal.
  - Object Permanence: Concept that objects still exist when they are out of sight

(adapted from Thomson Higher Education, 2007, 2001)



Jean Piaget: Stages of Cognitive Development

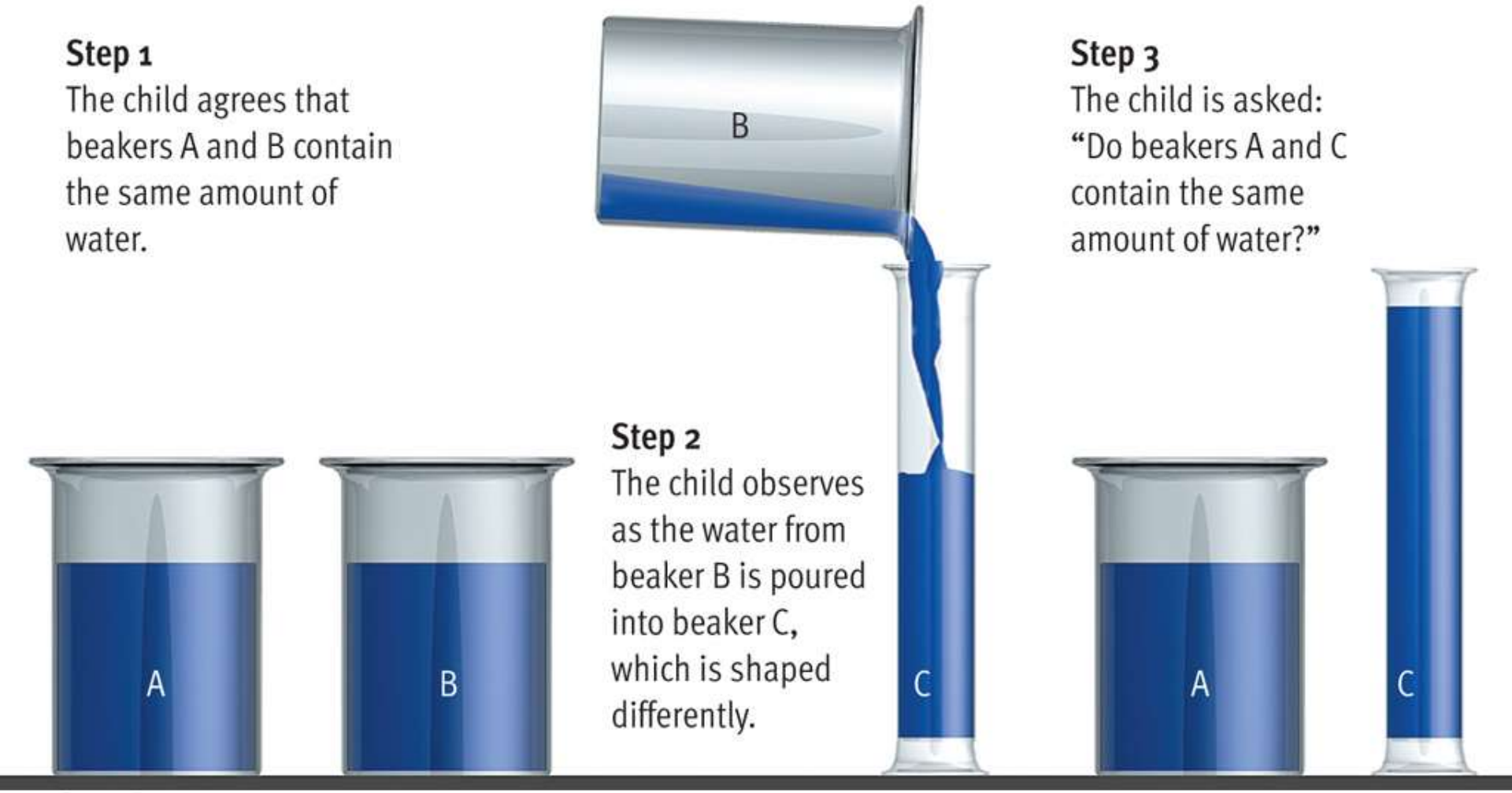
- **Preoperational Stage** (2-7 Years): Children begin to use language and think symbolically **but** their thinking is still intuitive and egocentric.
  - Intuitive: Makes little use of reasoning and logic
  - Egocentric Thought: Thought that is unable to take viewpoints of others

(adapted from Thomson Higher Education, 2007, 2001)

Jean Piaget: Stages of Cognitive Development

- **Concrete Operational Stage** (7-11 Years): Children become able to use concepts of time, space, volume, and number but in ways that remain simplified and concrete, and not abstract.
  - **Conservation**: Mass, weight and volume remain unchanged when the shape or appearance of objects changes
  - **Reversibility of Thought**: Relationships involving equality or identity can be reversed

(adapted from Thomson Higher Education, 2007, 2001)



(adapted from Thomson Higher Education, 2011)

Jean Piaget: Stages of Cognitive Development

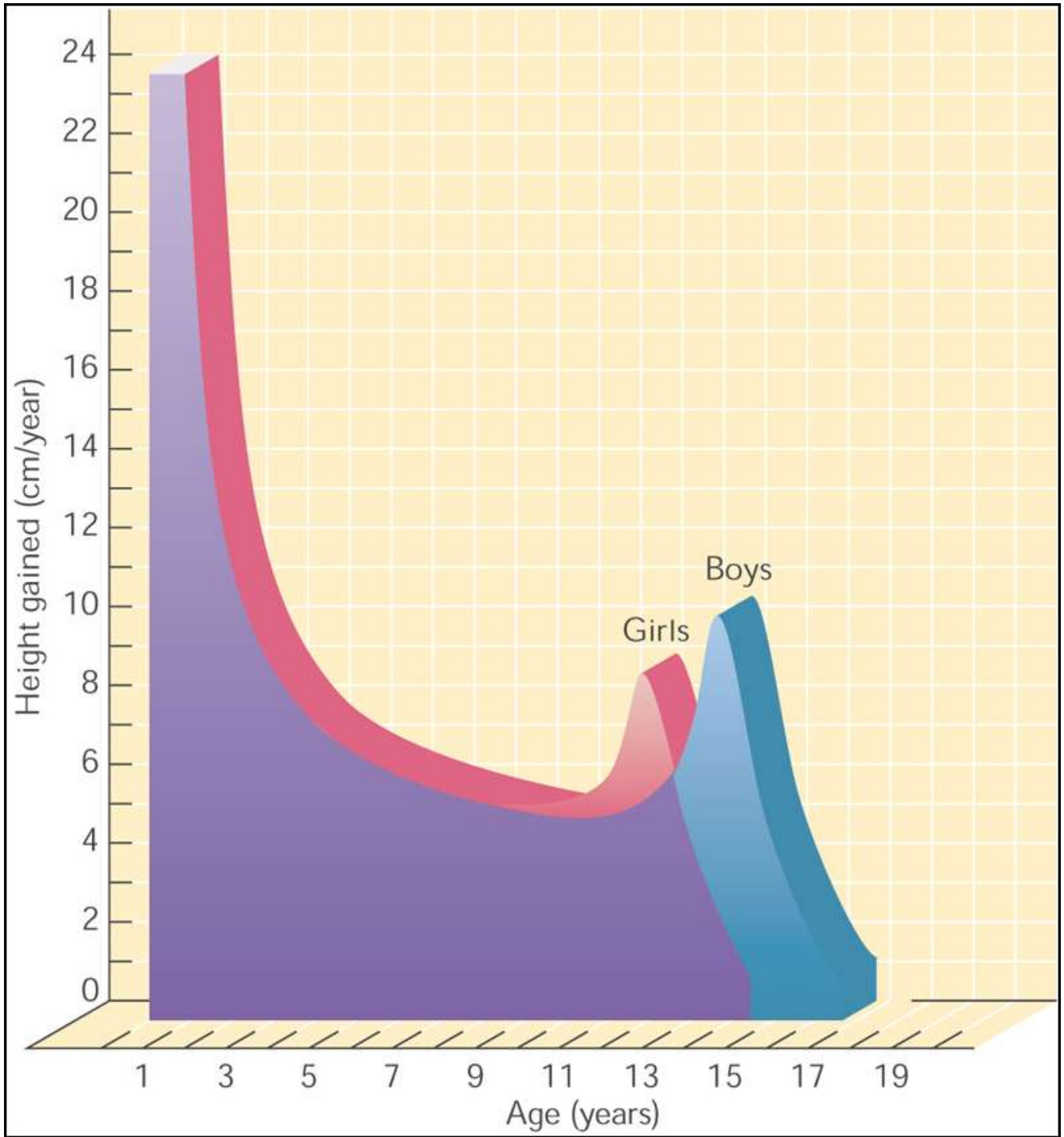
- **Formal Operations Stage** (11 Years and Up): Thinking now includes abstract, theoretical, and hypothetical ideas.
  - **Abstract Ideas**: Concepts and examples removed from specific examples and concrete situations
  - **Hypothetical Possibilities**: Suppositions, guesses, or projections

(adapted from Thomson Higher Education, 2007, 2001)

Piaget's Theory

(Cengage, 2019)

Development Across the Life Span



The typical rate of growth for boys and girls. Notice that growth in early adolescence equals that for ages 1 to 3. Note, too, the earlier growth spurt for girls.

(adapted from Wadsworth/Thomson Learning, 2001)

Adolescence: Physiological Changes

- **Secondary sex characteristics** – Physical features that distinguish one sex from the other but that are not essential for reproduction
- **Puberty** – The stage during which sexual functions reach maturity, which marks the beginning of adolescence
  - **Menarche** – The first occurrence of menstruation
  - **Spermarche** – The first occurrence of ejaculation
- Today's adolescents begin puberty at a younger age, and complete it more rapidly, than their counterparts in earlier generations.

(Cengage, 2019)

Adolescence: Neural Development

- Immaturity of the prefrontal cortex may explain why risky behavior peaks during adolescence.
  - The prefrontal cortex, crucial to cognitive control and emotional regulation, is the last area of the brain to fully mature.

- Other features of neural development also contribute.
  - Elevated sensitivity to reward is attributed to early maturation of the subcortical dopamine circuits that mediate pleasure.
  - The brain's early-maturing reward system overpowers the late-maturing prefrontal cortex.

- Susceptibility to peer influence may also contribute to adolescent risk taking.

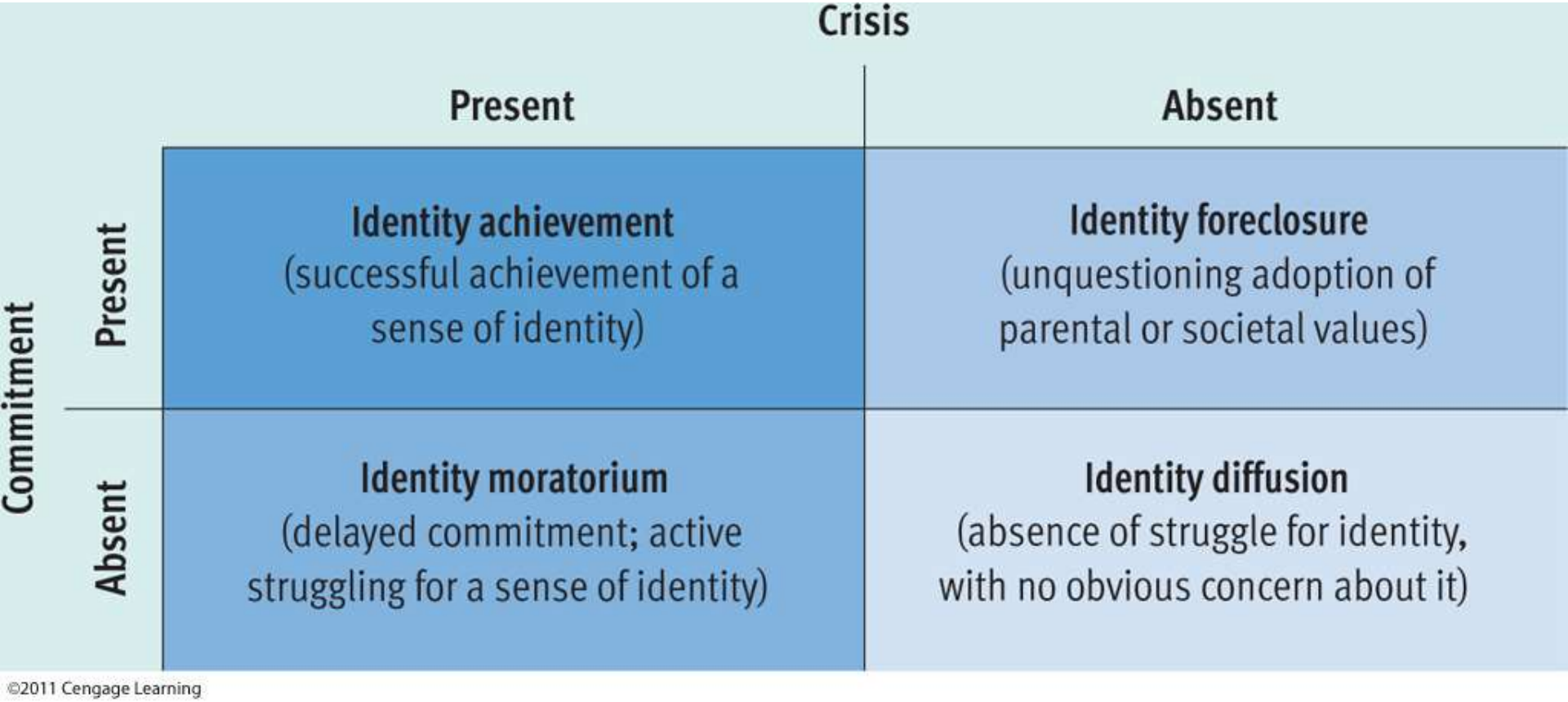
(Cengage, 2019)

Adolescence: The Search for Identity

Erik Erikson (1968)

- Premier challenge of adolescence – forming a sense of identity
- Create or identify a stable set of beliefs or values to act as an anchor or guide for behavior

(adapted from Thomson Higher Education, 2007, 2001)



(adapted from Thomson Higher Education, 2011)

Typical Life Goals and Concerns		
	TYPICAL GOALS ARE RELATED TO:	TYPICAL CONCERNS ARE RELATED TO:
Young adults	Education and family	Relationships and friends
Middle-aged	Children's lives and personal property	Occupational worries
Elderly	Good health, retirement, leisure, community	Health fears

(adapted from Wadsworth/Thomson Learning, 2001)

Average Age at First Marriage

Transitions in Family Life

- More young adults are prolonging the transitional period before forming a new family.
- More than 90% of adults eventually marry.

Adjusting to Marriage

- The most commonly reported problems are difficulties balancing work and marriage and financial concerns.
- Cohabitation prior to marriage has gradually become the norm rather than the exception.
- One major source of conflict in many new marriages is the negotiation of marital roles in relation to career commitments.

Transitions in Family Life

Adjusting to Parenthood

- The majority of married couples continue to have children.
- The transition to parenthood has more impact on mothers than on fathers.
- Research has found that:
  - Parents exhibit lower marital satisfaction than comparable nonparents.
  - Mothers of infants report the steepest decline in marital satisfaction.
  - The more children couples have, the lower their marital satisfaction tends to be.
- When youngsters reach adolescence, gradual realignments occur in parent-child relationships.

Aging and Physiological Changes

- People experience many physical changes as they progress through adulthood.
  - Hair tends to thin out and become gray.
  - Many men confront receding hairlines and baldness.
  - The proportion of body fat tends to increase.

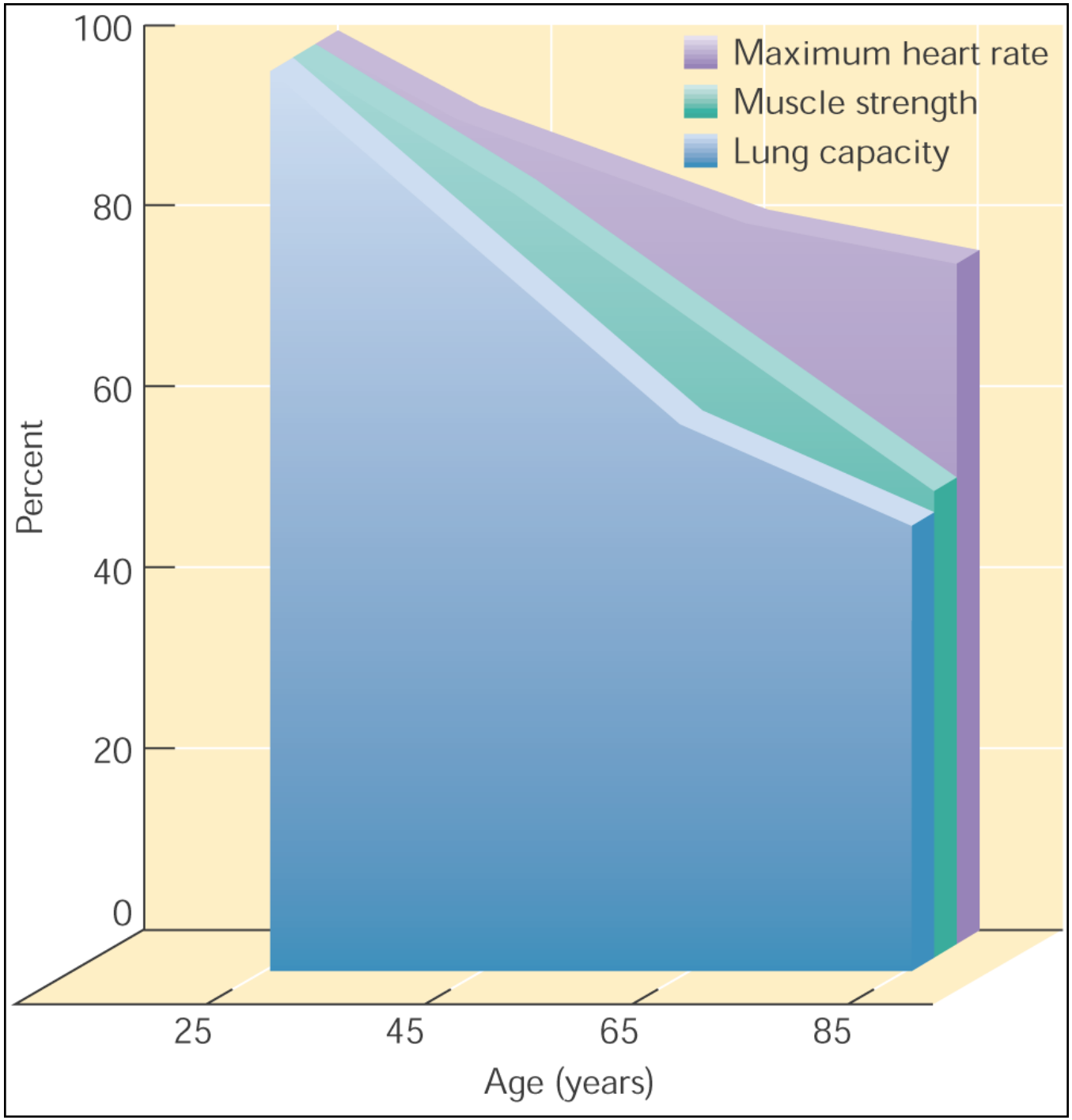
- In the sensory domain, the key changes occur in vision and hearing.
  - Farsightedness and difficulty seeing in low light become more common.
  - Hearing sensitivity becomes more noticeable after age 50.

- Age-related changes occur in hormonal functioning.
  - Among women, these changes lead to menopause.

- The proportion of people with chronic diseases climbs steadily.
  - Psychological factors have a protective value in diminishing the effects of aging.

(Cengage, 2019)

Physical aging, which is biologically programmed, progresses steadily from early adulthood onward. Regular exercise, good health practices, and a positive attitude can help minimize the impact of physical aging.

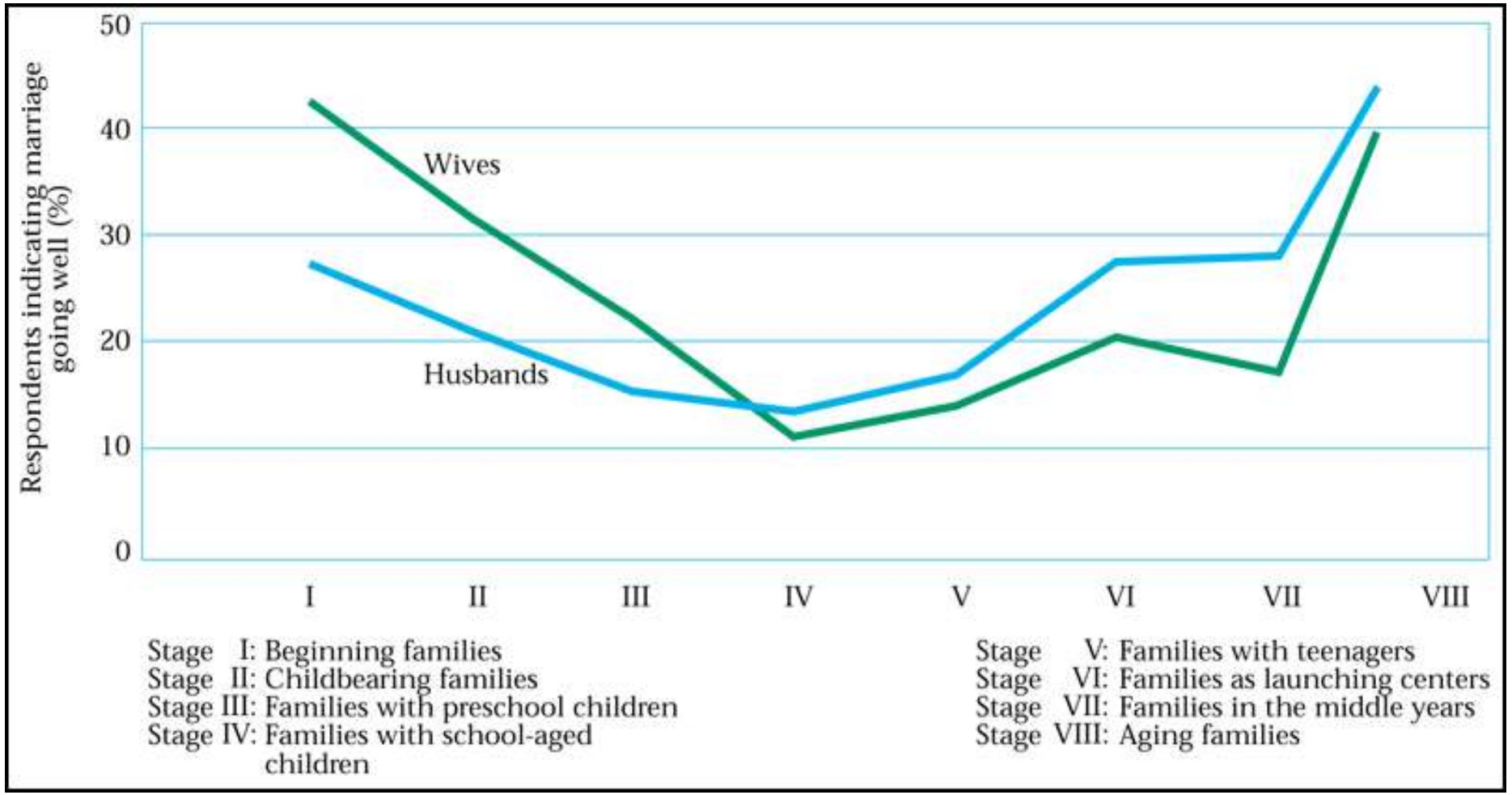


(adapted from Wadsworth/Thomson Learning, 2001)

Aging and Cognitive Changes

- Numerous studies report decreases in older adults' memory capabilities.
- Speed in learning, solving problems, and processing information tends to decline with age.
- Evidence supports the notion that high levels of mental activity in late adulthood can delay the typical age-related declines in cognitive functioning.

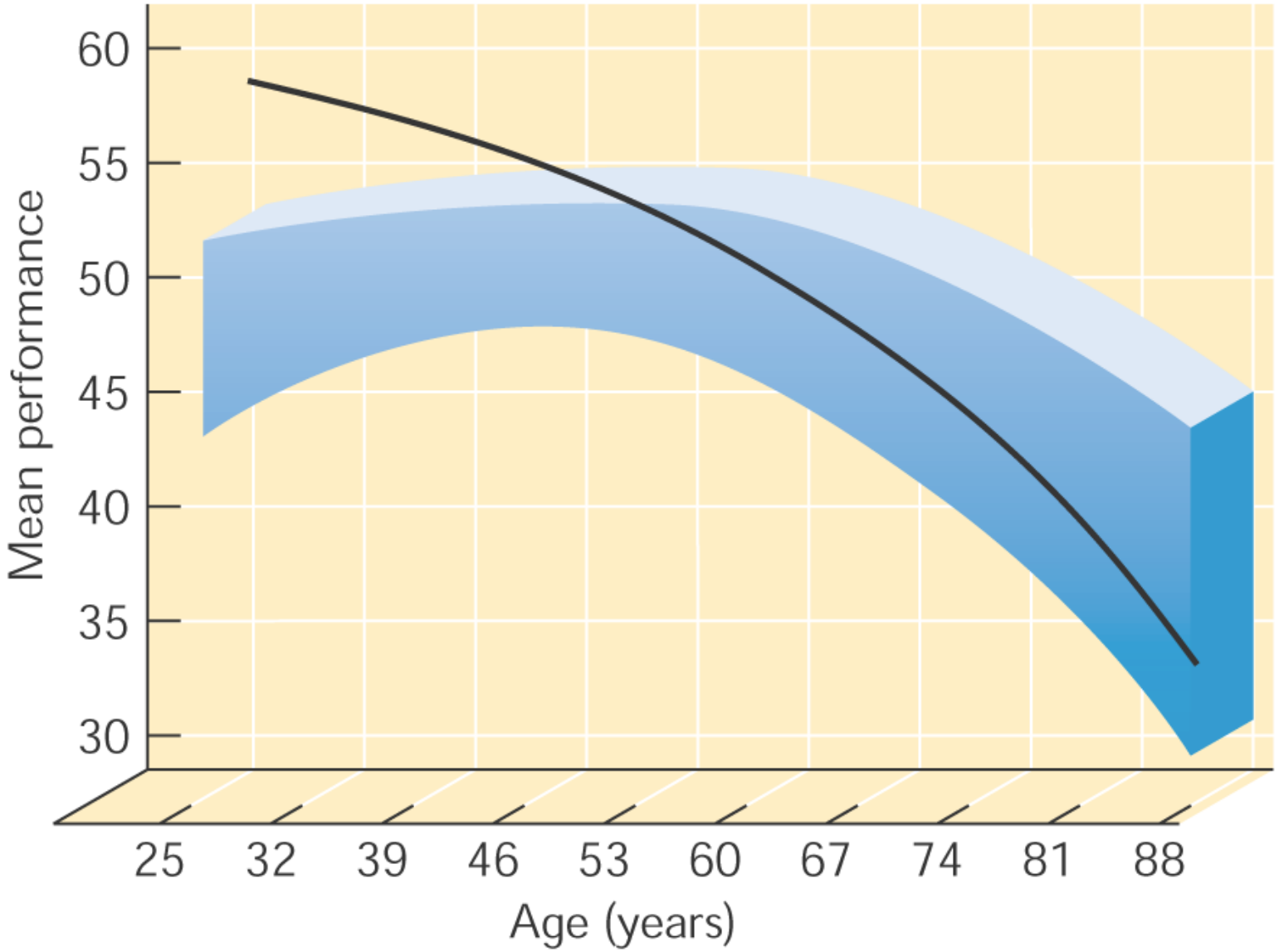
(Cengage, 2019)



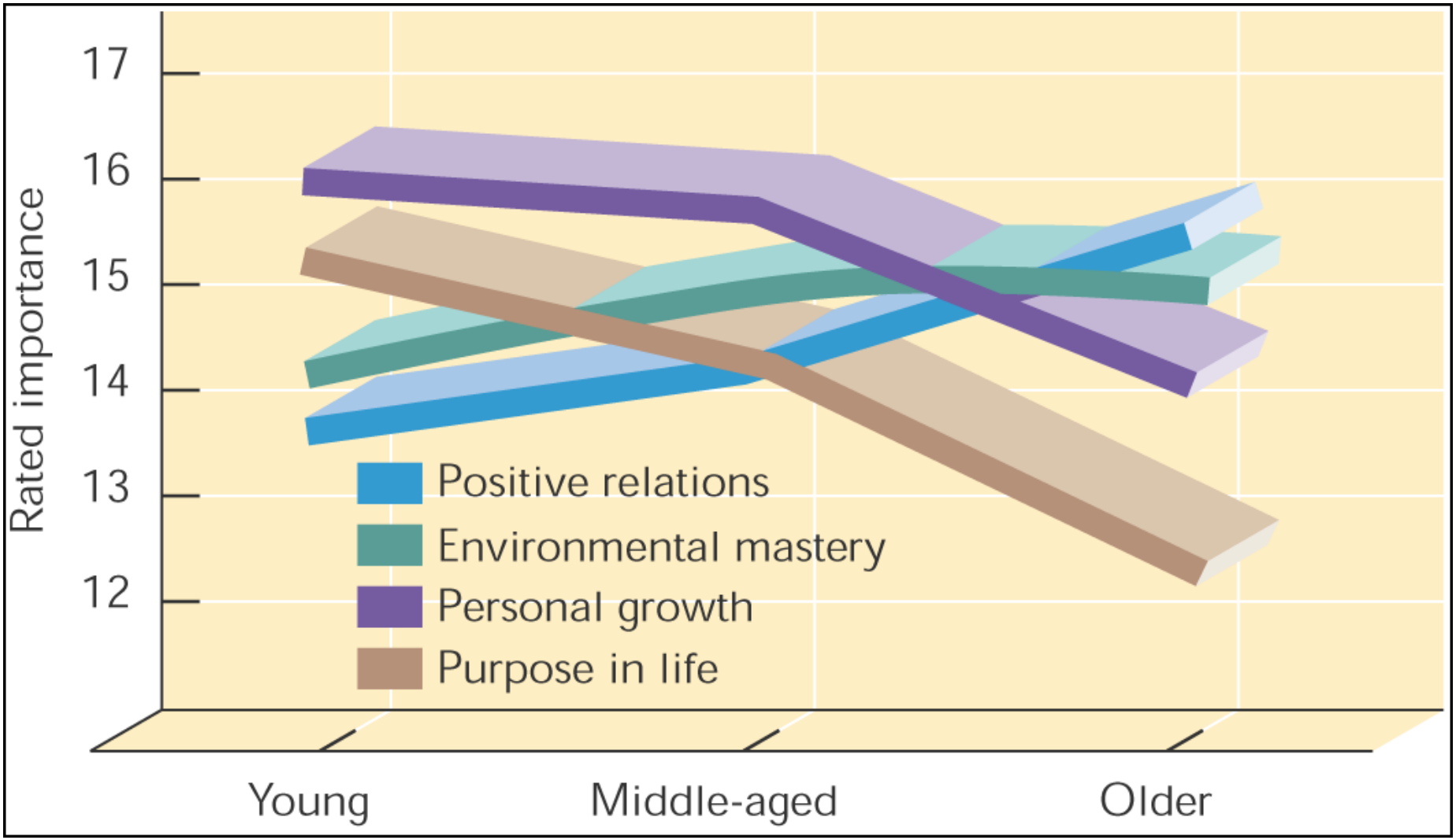
Marital satisfaction across the family life cycle. This graph depicts the percentage of husbands and wives who said their marriage was going well "all the time" at various stages of the family life cycle. Rollins and Feldman (1970) broke the family life cycle into eight stages. The U -shaped relationship shown here has been found in other studies as well, although its relevance is limited to families that have children in the traditional childbearing years.

(adapted from Wadsworth/Thomson Learning, 2001)

Average performance at various ages for verbal, numeric, spatial, and reasoning abilities all fall within the blue area of this graph. Notice that, in general, mental abilities show modest gains from young adulthood to early middle age. After that, they begin a slow decline. Notice, too, that most abilities at age 70 return to about the same levels found at age 25. Only after age 80 do declines become large enough to make a practical difference in mental abilities. One exception is perceptual speed (black line). This fluid ability declines steadily after age 25. (Adapted from Schaie, 1994.)



(adapted from Wadsworth/Thomson Learning, 2001)



Feelings of personal growth and of having a purpose in life tend to decline with increasing age. However, positive relations with other people and mastery of the environment tend to increase. Thus, the basis for a continued sense of well-being makes an interesting shift between young adulthood and old age. (Graph courtesy of Dr. Carol Ryff.)

(adapted from Wadsworth/Thomson Learning, 2001)

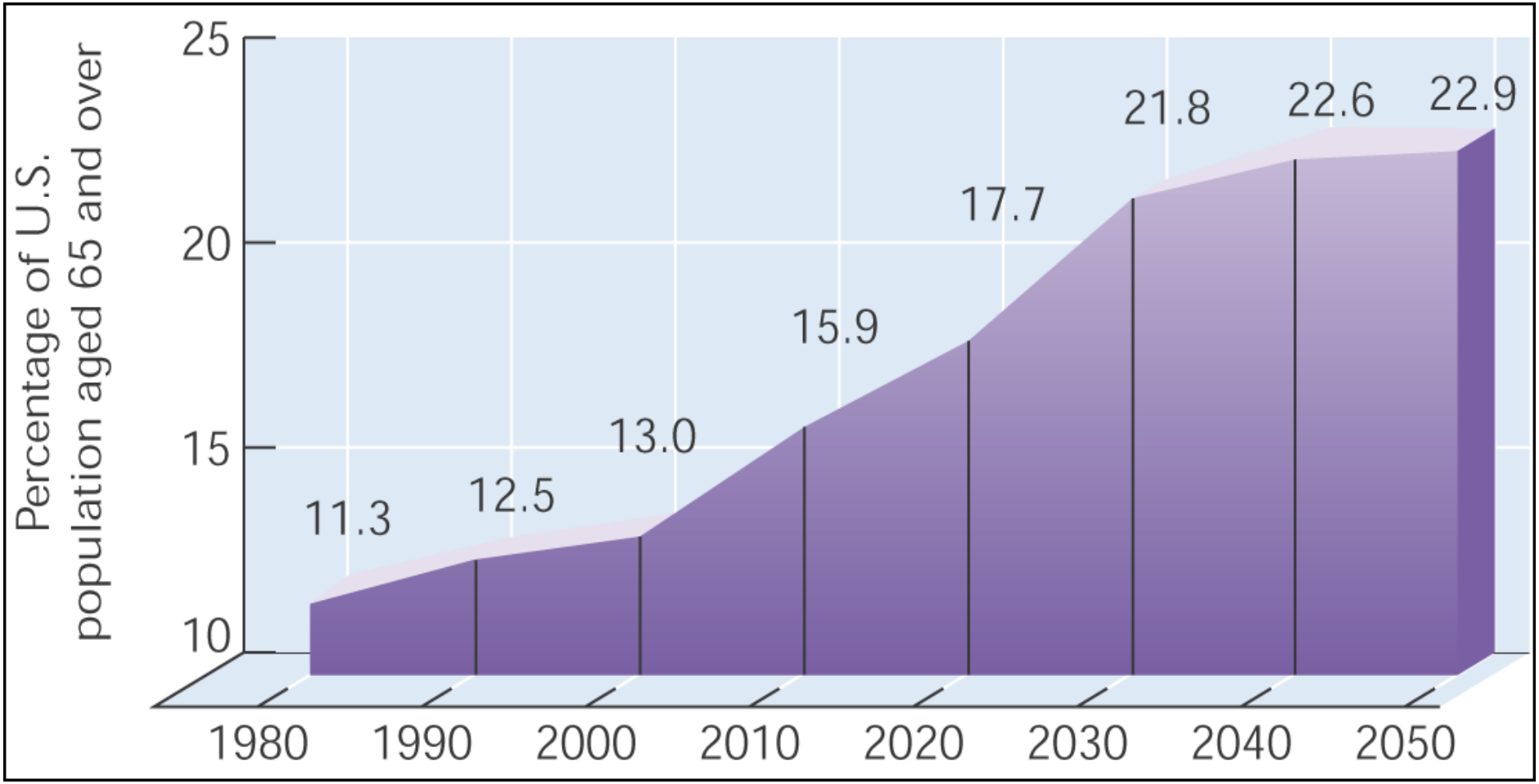
Death and Dying

- Anxiety about death typically declines from early to late adulthood.

- Kübler-Ross identified five stages of confronting death:
  - Denial
  - Anger
  - Bargaining (with God for more time)
  - Depression
  - Acceptance

- Considerable variation exists among cultures in how people deal with bereavement.

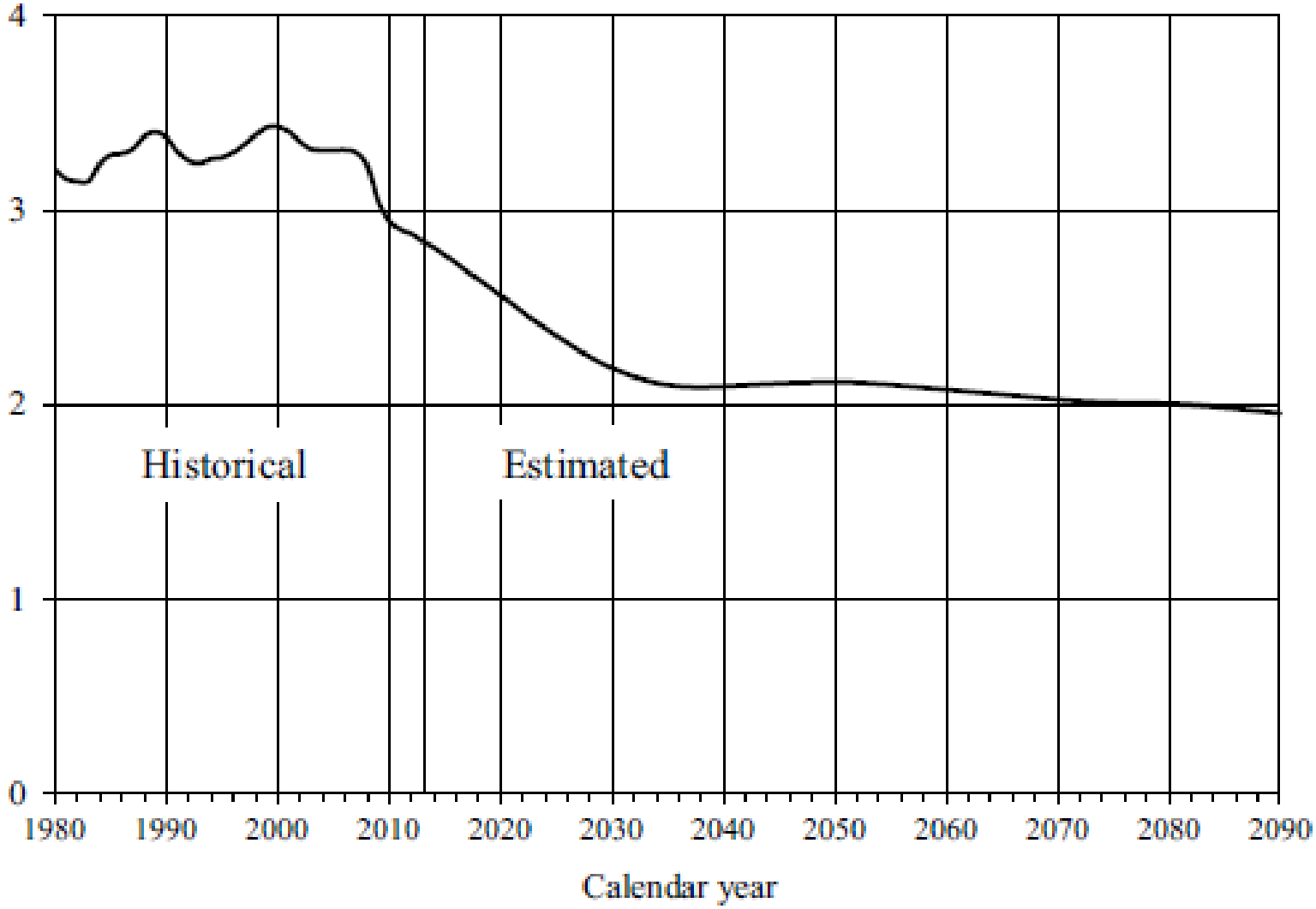
(Cengage, 2019)



Longer life expectancy will produce an unprecedented increase in the percentage of the population over age 65. The "boom" is expected to start now and peak by about 2030 to 2050

(adapted from Wadsworth/Thomson Learning, 2001)

Figure II.D4.—Number of Covered Workers Per OASDI Beneficiary



Source : Trustees' 2014 Annual Report

Figure II.D6.—Cumulative Scheduled OASDI Income Less Cost, From Program Inception Through Years 2013-88

[Present value as of January 1, 2014, in trillions]