Developing Through the Life Span

Psych 12000.003

Developing Through the Life Span

Prenatal Development and the Newborn

- Conception
- Prenatal Development
- The Competent Newborn

Infancy and Childhood

- Physical Development
- Cognitive Development
- Moral Development
- Attachment Style

Developing Through the Life Span

Adolescence

- Physical Development
- Cognitive Development
- Social Development
- Emerging Adulthood

Adulthood

- Physical Development
- Cognitive Development
- Social Development

Developing Through the Life Span

- Methodological Issues
  - How best to study?
    - Study same people across time (within-S or longitudinal design) or different aged people at the same time (between-S or cross lagged design)?
      - Same people across time: takes a long time, participants drop out, etc.
      - Different ages at same time: Effects could be because of the "era in which we live" (aka cohort effects)
- Development: What is changing across time?
  - The "big confound"
- Reflections on Two Major Developmental Issues
  - Continuity and Stages
  - Stability and Change

Development: What is it?

- Change (usually progressive change) across time.
- What changes in human development?
  - Physical form
  - Physical capabilities
  - Cognitive capabilities
  - Moral capabilities
  - Personality
  - Societal expectations
  - Roles
  - Responsibilities

Developmental Psychology

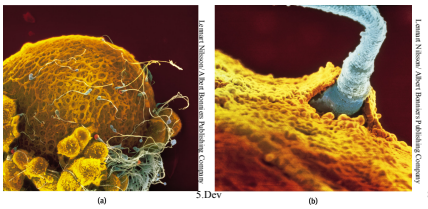
Big Issues	Questions they raise
Nature/Nurture	How do genetic inheritance (*our nature*) and experience (*the nurture we receive*) influence our behavior?
Continuity/Stages	Is developmental a gradual, continuous process or a sequence of separate stages?
Stability/Change	Do our early personality traits persist through life, or do we become different persons as we age.

Prenatal Development and the Newborn

How, over time, did we come to be who we are? From zygote to birth, development progresses in an orderly, though fragile, sequence.

Conception

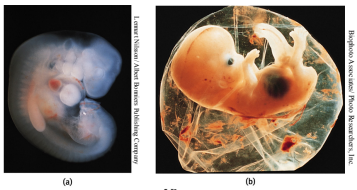
A single sperm cell (male) penetrates the outer coating of the egg (female) and fuses to form one fertilized cell.



(a) (b)

Prenatal Development

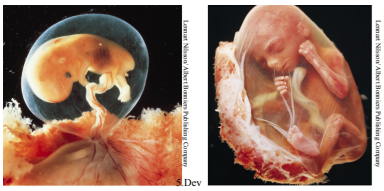
A zygote is a fertilized cell with 100 cells that become increasingly diverse. At about 14 days the zygote turns into an embryo (a and b).



(a) (b)

Prenatal Development

At 9 weeks, an embryo turns into a fetus (c and d). Teratogens are chemicals or viruses that can enter the placenta and harm the developing fetus.



(c) (d)

The Competent Newborn

Infants are born with reflexes that aid in survival, including rooting reflex which helps them locate food.

The Competent Newborn

Offspring cries are important signals for parents to provide nourishment. In animals and humans such cries are quickly attended to and relieved.

Infancy and Childhood

Infancy and childhood span from birth to the teenage years. During these years, the individual grows physically, cognitively, and socially.

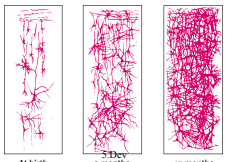
Stage	Span
Infancy	Newborn to toddler
Childhood	Toddler to teenager

Physical Development

Infants' psychological development depends on their biological development. To understand the emergence of motor skills and memory, we must understand the developing brain.

Developing Brain

The developing brain overproduces neurons. Peaking around 28 billion at 7 months, these neurons are pruned to 23 billion at birth. The greatest neuronal spurt is in the frontal lobe enabling the individual to think rationally.



At birth 3 months 15 months

Maturation

The development of the brain unfolds based on genetic instructions, causing various bodily and mental functions to occur in sequence— standing before walking, babbling before talking—this is called maturation.

Maturation sets the basic course of development, while experience adjusts it.

Sensory and social stimulation increases number of synapses and size of brain.

Maturation & Motor Development

First, infants begin to roll over. Next, they sit unsupported, crawl, and finally walk. Experience has little effect on this *sequence*. But experience does affect the timing.

Sitting unsupported 6 months | Crawling 8-9 months | Beginging to walk 12 months | Walking Independently 15 months

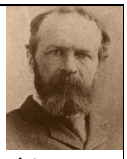
Maturation and Infant Memory

The earliest age of conscious memory is around 3½ years (Bauer, 2002). A 5-year-old has a sense of self and an increased long-term memory, thus organization of memory is different from 3-4 years.

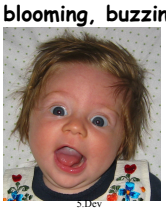
Developing a sense of "self."

Kicking moves the mobile, will be retained for about a month.

William James
(1842-1910)



The inner world of the infant mind is "One great blooming, buzzing confusion."



Does research support this belief?

Jean Piaget
August 9, 1896 – September 16, 1980

Cognitive Development

Piaget believed that the driving force behind intellectual development is our biological development amidst experiences with the environment. *Our cognitive development is shaped by the errors we make.*

Sliding a minature slide

Trying to sit in a miniature car

Schemas

Schemas are mental molds into which we pour our experiences.

Two-year-old Gabriella has learned the schema for "cow" from her picture books.

Gabriella sees a moose and calls it a "cow." She is trying to assimilate this new animal into an existing schema. Her mother tells her, "No, it's a moose."

Gabriella accommodates her schema for large, shaggy animals and continues to modify that schema to include "mommy moose," "baby moose," and so forth.

Assimilation and Accommodation

The process of *assimilation* involves incorporating new experiences into our current understanding (schema). The process of adjusting a schema and modifying it is called *accommodation*.

Jean Piaget with a subject

Piaget's Theory and Current Thinking

PIAGET'S STAGES OF COGNITIVE DEVELOPMENT

Typical Age Range	Description of Stage	Developmental Phenomena
Birth to nearly 2 years	*Sensorimotor* Experiencing the world through senses and actions (looking, touching, mouthing, and grasping)	• Object permanence • Stranger anxiety
2 to about 6 or 7 years	*Preoperational* Representing things with words and images; use intuitive rather than logical reasoning	• Pretend play • Egocentrism • Language development
About 7 to 11 years	*Concrete operational* Thinking logically about concrete events; grasping concrete analogies and performing arithmetical operations	• Conservation • Mathematical transformations
About 12 through adulthood	*Formal operational* Abstract reasoning	• Abstract logic • Potential for mature moral reasoning

Sensorimotor Stage

In the sensorimotor stage, babies take in the world by looking, hearing, touching, mouthing, and grasping. Children younger than 6 months of age do not comprehend object permanence, i.e., objects that are out of sight are also out of mind.

At 8 months of age what is out of sight is not out of mind.

Sensorimotor Stage: Criticisms

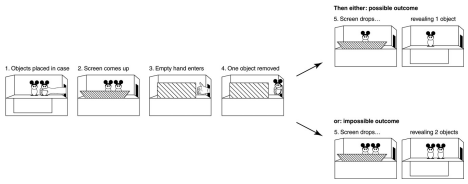
Piaget believed children in the sensorimotor stage could not think —in the sense that they do not have any abstract concepts or ideas.

However, recent research shows that children in the sensorimotor stage can think abstractly and count. *(you just have to figure out how to show this!)*

- Children understand the basic laws of physics. They are amazed at how a ball can stop in midair or disappear.

Sensorimotor Stage: Criticisms

- Children can also count. Wynn (1992, 2000) showed that children stared longer at the wrong number of objects than the right ones.



Preoperational Stage

Piaget suggested that from 2 years old to about 6-7 years old, children are in the preoperational stage—too young to perform mental operations.

The child points to the left flask as having more liquid when in fact the two flasks contain the same amount of liquid. The inability to use a mental *operation* and understanding conservation of liquid amounts is lacking at this stage.

Play Toolkit video on conservation

Preoperational Stage: Criticism

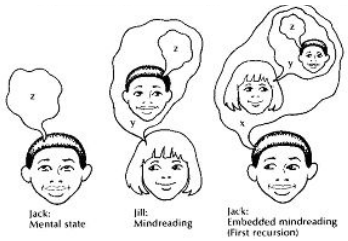
DeLoache (1987) showed that children as young as 3 years of age are able to use mental operations. When shown a model of a dog's hiding place behind the couch, a 2½-year-old could not locate the stuffed dog in an actual room, but the 3-year-old did.

Egocentrism

•Piaget concluded that preschool children are egocentric. They cannot perceive things from another's point of view.

•When asked to show her picture to mommy, 2-year-old Gabriella holds the picture facing her own eyes, believing that her mother can see it through her eyes.

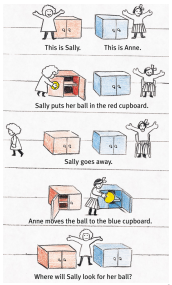
Theory of Mind



Theory of Mind

Preschoolers, although still egocentric, develop the ability to understand another's mental state when they begin forming a theory of mind.

The problem on the right probes such ability in children.



Play videoToolkit

Concrete Operational Stage

In concrete operational stage, given concrete materials, 6- to 7-year-olds grasp conservation problems and mentally pour liquids back and forth into glasses of different shapes conserving their quantities.

Children in this stage are also able to transform mathematical functions. So, if 4 + 8 = 12, then a transformation, 12 – 4 = 8, is also easily doable.

Formal Operational Stage

Around age 12, our reasoning ability expands from concrete thinking to abstract thinking. We can now use symbols and imagined realities to systematically reason. Piaget called this formal operational thinking.

Formal Operational Stage

Rudiments of such thinking begin earlier (age 7) than what Piaget suggested, since 7-year-olds can solve the problem below (Suppes, 1982).

If John is in school, Mary is in school. John is in school. What can you say about Mary?

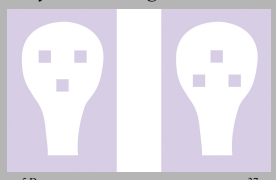
Reflecting on Piaget's Theory

Piaget's stage theory has been influential globally, validating a number of ideas regarding growth and development in many cultures and societies. However, today's researchers believe the following:

- Development is a continuous process.
- Children express their mental abilities and operations at an earlier age.
- Formal logic is a smaller part of cognition.

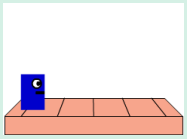
Cognitive Development in the Newborn: A Major Methodological Breakthrough

Investigators study infants becoming habituated to (used to) objects over a period of time. *Infants pay more attention to new objects than habituated ones, which shows they are learning.*



Cutting Edge Research

- Thomsen, Frankenhuis, Ingold-Smith, & Carey. (2011). Big and mighty: Preverbal infants mentally represent social dominance. *Science, 331*, 477-480.
- IV: Bigger object "wins" or smaller object "wins"
- DV: Attention (as measured by length of eye gaze).



http://beforeitsnews.info/story/381/234/Babies_Know_Who_Is_Boss,_Infants_Understand_Social_Dominance_Before_1st_Birthday.html

Results

10-13 month old infants (but not 8 month old infants) looked longer when the smaller object "wins," suggesting that this is the surprising outcome.

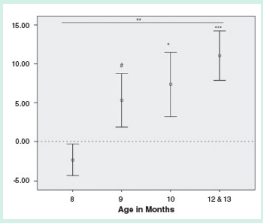


Fig. 1. Developmental onset of the Conflicting Goals effect (experiment 2). Continued mean differential looking times (TSEM) at unexpected over expected test trials by categorical age, once the animations had frozen to stills (after 19.1s), are shown. N=64 infant participants (8-, 9-, 10-, and 12-to 13-month-olds). #P(one-tailed)=0.073, *P (one-tailed) = 0.048, **P=0.032, ***P (one-tailed) = 0.0015.

Personality Development

- Psychosexual development (Freud, 1940s)
  - Stages of development (fixations at erogenous zones)
    - Oral (0-18 months):
      - Under-indulged: pessimism, envy, suspicion, sarcasm
      - Over-indulged: Optimistic, gullible, admires others
    - Anal (18 months - 36 months)
      - Anal retentive: neat, precise, orderly, careful, stingy
      - Anal expulsive: Messy, disorganized reckless careless, defiant
    - Phallic (3 - 6 year olds)
      - Oedipal/Electra Complex: Inability to possess opposite sex parent results in super ego development/Same sex identification
      - Castration anxiety/Penis Envy
    - Latency (6 yo - puberty)
    - Genital (Puberty and beyond)

Social Development

Stranger anxiety is the fear of strangers that develops at around 8 months. This is the age at which infants form schemas for familiar faces and cannot assimilate a new face.

© Christina Kennedy/ PhotoEdit

Origins of Attachment

Harlow Primate Laboratory, University of Wisconsin

Harlow (1971) showed that infant rhesus monkeys bond with surrogate mothers because of bodily contact and not because of nourishment.

Origins of Attachment

Like bodily contact, familiarity is another factor that causes attachment. In some animals (goslings), imprinting is the cause of attachment.

Attachment Theory

- Bowlby, Ainsworth
- Secure attachment— "comfortable sense of trust in the primary caregiver"
- Security is predicted by warm, sensitive, responsive parenting from primary caregiver
- Insecurity is predicted by detached, uninvolved, unresponsive, intrusive parenting
- Insecurity is a risk factor for subsequent behavior problems, problems with peers, relationships, poor social competence

Attachment Differences

Placed in a strange situation, 60% of children express secure attachment, i.e., they explore their environment happily in the presence of their mothers. When their mothers leave, they show distress.

Another 30% show insecure attachment. These children cling to their mothers or caregivers and are less likely to explore the environment.

10% - anxious avoidant.

Strange Situation: http://www.youtube.com/watch?v=QTsewNrHUHU&NR=1

Still face: http://www.youtube.com/watch?v=HD3_nHXFkmw

Bowlby; Ainsworth

Still Face With Autistic Child

Secure Attachment

Relaxed and attentive caregiving becomes the backbone of secure attachment.

Barry Hewlett

Insecure Attachment

Harlow's studies showed that rhesus monkeys experience great anxiety if their terry-cloth mother is removed.

Harlow Primate Laboratory, University of Wisconsin

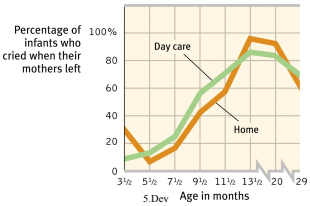
Attachment Differences: Why?

Why do these attachment differences exist?

Factor	Explanation
Mother	Both rat pups and human infants develop secure attachments if the mother is relaxed and attentive.
Father	In many cultures where fathers share the responsibility of raising children, similar secure attachments develop.

Separation Anxiety

Separation anxiety peaks at 13 months of age, regardless of whether the children are home or sent to day care.



Deprivation of Attachment

What happens when circumstances prevent a child from forming attachments?

In such circumstances children become:

- Withdrawn
- Frightened
- Unable to develop speech

Prolonged Deprivation

If parental or caregiving support is deprived for an extended period of time, children are at risk for physical, psychological, and social problems, including alterations in brain serotonin levels.

Recall, serotonin is the neurotransmitter important in inhibition of anger and aggression.

Day Care and Attachment

Quality day care that consists of responsive adults interacting with children does not harm children's thinking and language skills.

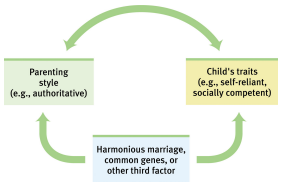
However, some studies suggest that extensive time in day care, especially **when combined with avoidant parenting**, can increase aggressiveness and defiance in children.

Child-Rearing Practices

Practice	Description
Authoritarian	Parents impose rules and expect obedience.
Permissive	Parents submit to children's demands.
Authoritative	Parents are demanding but responsive to their children.

Authoritative Parenting

Authoritative parenting correlates with social competence — other factors like common genes may lead to an easy-going temperament and may invoke an authoritative parenting style.



Moral Development

Moral judgment (Kohlberg, 1958; Gilligan, 1977)

- Pre-conventional
  - How can I avoid punishment?
  - What's in it for me?
- Conventional
  - The good boy/good girl attitude
  - Law and order morality
- Post-conventional
  - Social contract
  - Universal ethical principles

More focus on females; Ethics of caring

Developing Morality

Kohlberg (1981, 1984) sought to describe the development of moral reasoning by posing moral dilemmas to children and adolescents, such as "Should a person steal medicine to save a loved one's life?" He found stages of moral development.

AP Photo/ Dave Martin

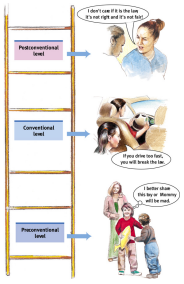
Example Dilemma

In Europe, a woman was near death from a special kind of cancer. There was one drug that the doctors thought might save her. It was a form of radium that a druggist in the same town had recently discovered. the drug was expensive to make, but the druggist was charging ten times what the drug cost him to make. He paid $400 for the radium and charged $4,000 for a small dose of the drug. The sick woman's husband, Heinz, went to everyone he knew to borrow the money and tried every legal means, but he could only get together about $2,000, which is half of what it cost. He told the druggist that his wife was dying, and asked him to sell it cheaper or let him pay later. But the druggist said, "No, I discovered the drug and I'm going to make money from if." So, having tried every legal means, Heinz gets desperate and considers breaking into the man's store to steal the drug for his wife.

1. Should Heinz steal the drug?
   1a. Why or why not?
2. Is it actually right or wrong for him to steal the drug?
   2a. Why is it right or wrong?

Moral Thinking

- Preconventional Morality: Before age 9, children show morality to avoid punishment or gain reward.
- Conventional Morality: By early adolescence, social rules and laws are upheld for their own sake.
- Postconventional Morality: Affirms people's agreed-upon rights or follows personally perceived ethical principles.



Moral Feeling

Moral feeling is more than moral thinking. When posed with simulated moral dilemmas, the brain's emotional areas only light up when the nature of the dilemmas is emotion-driven.

Moral Action

Moral action involves doing the right thing. People who engage in doing the right thing develop empathy for others and the self-discipline to resist their own impulses.

Social Development

Peer groups
Erickson's
Identity vs Role
Confusion

ERIKSON'S STAGES OF PSYCHOSOCIAL DEVELOPMENT

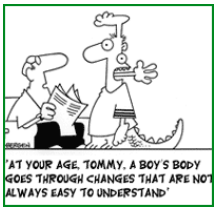
Stage (approximate age)	Issues	Description of Task
Infancy (to 1 year)	*Trust vs. mistrust*	If needs are dependably met, infants develop a sense of basic trust.
Toddlerhood (1 to 2 years)	*Autonomy vs. shame and doubt*	Toddlers learn to exercise will and do things for themselves, or they doubt their abilities.
Preschooler (3 to 5 years)	*Initiative vs. guilt*	Preschoolers learn to initiate tasks and carry out plans, or they feel guilty about efforts to be independent.
Elementary school (6 years to puberty)	*Competence vs. inferiority*	Children learn the pleasure of applying themselves to tasks, or they feel inferior.
Adolescence (teen years into 20s)	*Identity vs. role confusion*	Teenagers work at refining a sense of self by testing roles and then integrating them to form a single identity, or they become confused about who they are.
Young adulthood (20s to early 40s)	*Intimacy vs. isolation*	Young adults struggle to form close relationships and to gain the capacity for intimate love, or they feel socially isolated.
Middle adulthood (40s to 60s)	*Generativity vs. stagnation*	In middle age, people discover a sense of contributing to the world, usually through family and work, or they may feel a lack of purpose.
Late adulthood (late 60s and up)	*Integrity vs. despair*	When reflecting on his or her life, the older adult may feel a sense of satisfaction or failure.

See: videoToolKit

Self-Concept

Self-concept, a sense of one's identity and personal worth, emerges gradually around 6 months. Around 15-18 months, children can recognize themselves in the mirror. By 8-10 years, their self-image is stable.

Adolescence

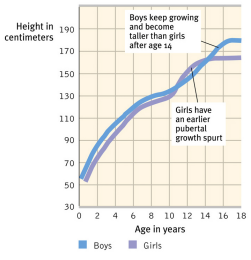


Adolescence

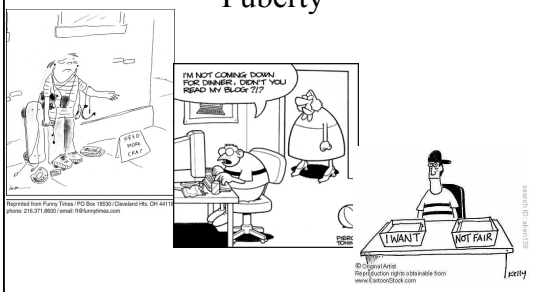
Many psychologists once believed that our traits were set during childhood. Today psychologists believe that development is a lifelong process. Adolescence is defined as a life between childhood and adulthood.

Physical Development

Adolescence begins with puberty (sexual maturation). Puberty occurs earlier in females (11 years) than males (13 years). Thus height in females increases before males.



Puberty

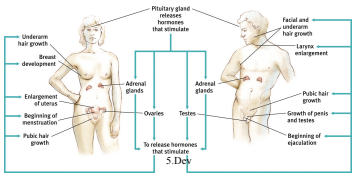


Primary Sexual Characteristics

During puberty primary sexual characteristics — the reproductive organs and external genitalia — develop rapidly.

Secondary Sexual Characteristics

Also secondary sexual characteristics—the nonreproductive traits such as breasts and hips in girls and facial hair and deepening of voice in boys develop. Pubic hair and armpit hair grow in both sexes.



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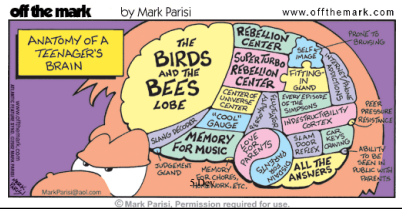
Adolescent Brain Development

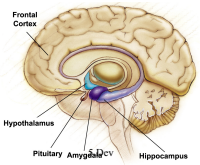
Until puberty, neurons increase their connections. At adolescence, **selective pruning of unused neurons begins.** Unused neuronal connections are lost to make other pathways more efficient.

"You lose what you don't use"



Frontal Cortex

During adolescence, neurons in the frontal cortex grow myelin, which speeds up nerve conduction. The frontal cortex lags behind the limbic system's development. Hormonal surges and the limbic system may explain occasional teen impulsiveness.



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Cognitive Development

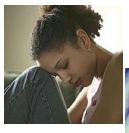
Adolescents' ability to reason gives them a new level of **social awareness**. In particular, they may think about the following:

- Their own thinking.
- What others are thinking.
- What others are thinking about them.
- How ideals can be reached. They criticize society, parents, and even themselves.

5.Dev

Social Awareness and Self-Esteem

- When females reach adolescence, they are about twice as likely to be depressed when compared to their male counterparts.
- Body image issues (for girls, but also for guys)



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Developing Reasoning Power

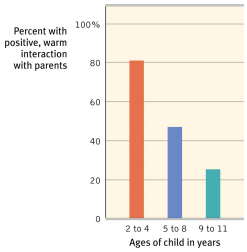
According to Piaget, adolescents can handle abstract problems, i.e., they can perform *formal operations*. Adolescents can judge good from evil, truth and justice, and think about God in deeper terms.

Forming an Identity

- In Western cultures, many adolescents try out different selves before settling into a consistent and comfortable identity. Having such an identity leads to forming close relationships.
- Independence from parents
- Figuring out "who we are"
- May be exploring sexual orientation, religious beliefs, etc.

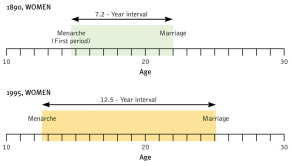
Parent and Peer Influence

Although teens become independent of their parents as they grow older, they nevertheless relate to their parents on a number of things, including religiosity and career choices. Peer approval and relationships are also very important.



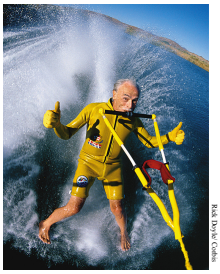
Emerging Adulthood

Emerging adulthood spans ages 18-25. During this time, young adults may live with their parents and attend college or work. On average, emerging adults marry in their mid-twenties.



Adulthood

Although adulthood begins sometime after a person's mid-twenties, defining adulthood into stages is more difficult than defining stages during childhood or adolescence.

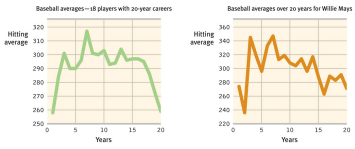


Physical Development

The peak of physical performance occurs around 20 years of age, after which it declines imperceptibly for most of us.

Middle Adulthood

Muscular strength, reaction time, sensory abilities and cardiac output begin to decline after the mid-twenties. Around age 50, women go through menopause, and men experience decreased levels of hormones and fertility.



5.Dev

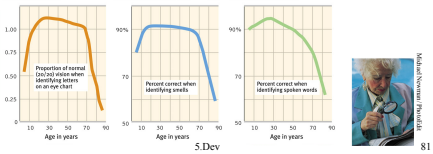
Willie Mays batting performance.

Old Age: Life Expectancy

Life expectancy at birth increased from 49% in 1950 to 67% in 2004 and to 80% in developed countries. Women outlive men and outnumber them at most ages.

Old Age: Sensory Abilities

After age 70, hearing, distance perception, and the sense of smell diminish, as do muscle strength, reaction time, and stamina. After 80, neural processes slow down, especially for complex tasks.



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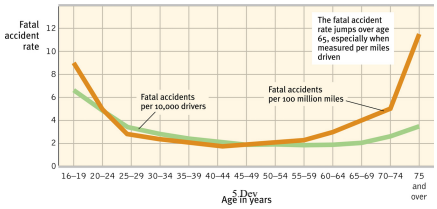
Old Age: Motor Abilities

At age 70, our motor abilities also decline. A 70-year-old is no match for a 20-year-old individual. Fatal accidents also increase around this age.



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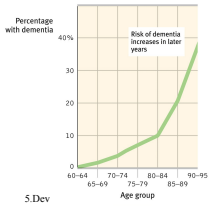
Old Age: Dementia

With increasing age, the risk of dementia also increases. Dementia is not a normal part of growing old.



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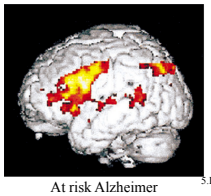
Old Age: Alzheimer's Disease

The risk for developing Alzheimer's disease also increases with age. Individuals who are in the early stages of this disease show more MRI activity in the brain than do normal individuals of the same age.



At risk Alzheimer

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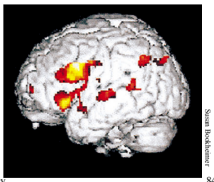


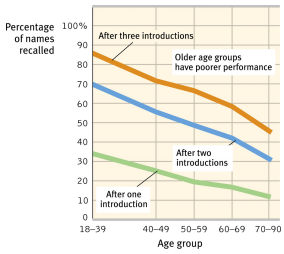
Normal

Cognitive Development

Do cognitive abilities like memory, creativity, and intelligence decline with age the same way physical abilities do?

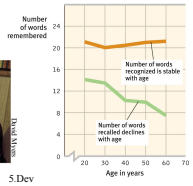
Aging and Memory

As we age, we remember some things well. These include recent past events and events that happened a decade or two back. However, recalling names becomes increasingly difficult.



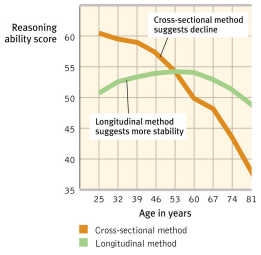
Aging and Memory

Recognition memory does not decline with age, and material that is meaningful is recalled better than meaningless material. The same is true for prospective memory (remember to …).



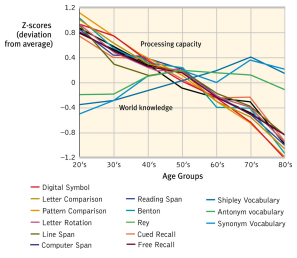
Aging and Intelligence

Longitudinal studies suggest that intelligence remains relative as we age. It is believed today that fluid intelligence (ability to reason speedily) declines with age, but crystalline intelligence (accumulated knowledge and skills) does not.



Aging and Other Abilities

A number of cognitive abilities decline with age. However, vocabulary and general knowledge increase with age.

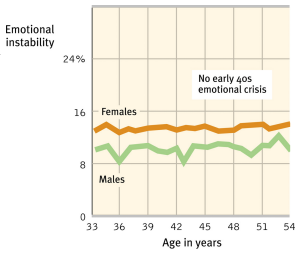


Social Development

Many differences between the young and old are not simply based on physical and cognitive abilities, but may instead be based on life events associated with family, relationships, and work.

Adulthood's Ages and Stages

Psychologists doubt that adults pass through an orderly sequence of age-bound stages. Mid-life crises at 40 are less likely to occur than crises triggered by major events (divorce, new marriage).



Neuroticism scores, 10,000 subjects (McCrae & Costa, 1996).

Adulthood's Commitments

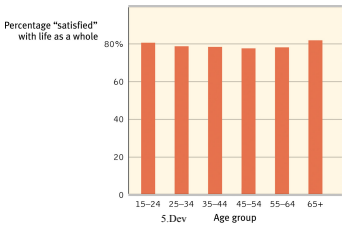
Love and work are defining themes in adult life. Evolutionary psychologists believe that commitment has survival value. Parents that stay together are likely to leave a viable future generation.

Adulthood's Commitments

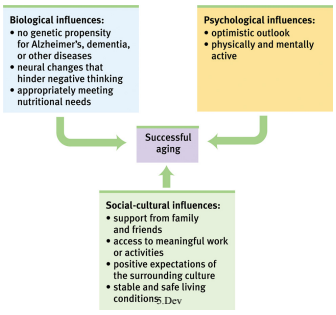
Happiness stems from working in a job that fits your interests and provides you with a sense of competence and accomplishment.

Well-Being Across the Life Span

Well-being and people's feelings of satisfaction are stable across the life span.



Successful Aging



Death and Dying

There is no "normal" reaction or series of grief stages after the death of a loved one. Grief is more sudden if death occurs unexpectedly. People who reach a sense of integrity in life (in Erikson's terms) see life as meaningful and worthwhile.

Developmental Issues

Continuity and Stages

Researchers who view development as a slow, continuous process are generally those who emphasize experience and learning. Biologists, on the other hand, view maturation and development as a series of genetically predisposed steps or stages. These include psychologists like Piaget, Kohlberg and Erikson.

Developmental Issues

Stability and Change

Lifelong development requires both stability and change. Personality gradually stabilizes as people age. However, this does not mean that our traits do not change over a lifetime. Some temperaments are more stable than others.