Defining Adolescence

Adolescence is defined as the period of development that begins with the onset of sexual maturity (about 11 to 14 years of age) and lasts until the beginning of adulthood (about 18 to 21 years of age).

The beginning of this growth spurt signals the onset of puberty: primary sexual characteristics are the onset of bodily changes associated with sexual maturity and are directly involved in reproduction: girls begin to menstruate and boys begin to ejaculate; secondary sexual characteristics are those bodily structures that change at puberty and are not directly involved in reproduction--girls developing breasts and boys begin growing facial hair.

Just before puberty, there is a marked increase in the growth rate of tissue that connects different regions of the brain. Paus et al. (2005) report that synaptic connections between Broca's area in the frontal lobe and Wernicke's area in the parietal lobe become stronger and denser between the ages of 4 and 17. These connections presumably allow brain areas to share information faster and more efficiently. Fig. 11.1

The most significant neural changes occur in the prefrontal lobe, associated with the ability to regulate emotions and control attention and behavior.

Originally it was thought that an infant's brain demonstrates synaptic proliferation, and in late adolescence, synaptic pruning takes precedence. Now we know that there is a second wave of proliferation just before puberty, and a second pruning just after adolescence.

During this second period, the prefrontal cortex also seems to be forming faster, more efficient connections with the rest of the brain.
Adolescence & Adulthood

- Adolescence is the period of development that begins with the onset of sexual maturity (about 11 to 14 f/m) and lasts until the beginning of adulthood (18 to 21); primary sexual characteristics.

- Puberty: the bodily changes associated with sexual maturity. Remember to differentiate primary sexual characteristics from secondary ones.

- Primary: bodily structures that are directly involved in reproduction.

- Secondary: bodily structures that change dramatically with sexual maturity but that are not directly involved in reproduction.

- The charts and graphs for ”Your Brain and Puberty” will be on the next exam.

- Infants at age 2 have 15,000 synapses per neuron, adult humans have only half that. Unused synapses are pruned, making the brain use experience more effectively.

- Connections between Broca's area and Wernicke's area become stronger (thicker, improved info sharing) between 4 and 17. (Paus et al., 1999)

- Synaptic proliferation happens twice in a human brain after birth: infancy and pre-puberty; synaptic pruning happens twice: later infancy & during adolescence. Use it or lose it.
The Protraction of Adolescence

- About 60% of preindustrial societies don't have a word for adolescence; a first menstruation, a Krobo girl is tutored on sex and reproduction by adult woman for two weeks, and becomes a full adult.
- In the 19th century, menses occurred between 16 and 17; by 1960, it was 13.
- Puberty is accelerated by bodyfat (Kim & Smith, 1998) and by improved diet and health.
- Puberty in girls can also be accelerated by exposure to environmental toxins that mimic estrogen (Buck-Louis et al., 2008) or by family distress (Belsky, 2012).
- Thus, the age at which people become physically adult has decreased, but the age at which they are prepared to take on adult responsibilities has increased. This is protracted adolescence.
Adolescent Sexuality

Early puberty is a source of psychological distress for girls. (Mendel, Turkheimer & Emery, 2007).

Early puberty creates unrealistic expectations and demands the adolescent may have trouble fulfilling.

Early girl bloomers draw the attention of older men, who may lead them into a variety of unhealthy activities. (Ge, Conger, & Elder, 1996).

For some girls, the timing of puberty has a greater effect on emotional and behavioural problems than does puberty itself. (Buchanan et al., 1992)

Early maturing boys may have more problems less, or not at all. (Ge, Conger, & Elder, 2001).

The speed--tempo--at which boys go from children to adolescence may be a better predictor of negative outcomes. (Middleton et al., 2010).

Same sex orientation: Most gay men report become aware of their attraction between ages 6 & 18; lesbians between 11 & 26. (Calzo et al., 2011).

The 2013 Pew Research Center Global Attitudes revealed a huge variability in the percentage of people saying that homosexuality should be accepted by society.
Sexual Orientation: A Matter Of Biology

Almost half of LBGT youth in Canada (Taylor & Peter, 2011) indicated that they did not feel they belonged in their school community. This sense of belonging is a key component of social inclusion and it important if the transition to adulthood is to be successful.

The brains of gay and lesbian people look in some ways like the brains of opposite-sex straight people.

**Gynephilic:** (attracted to women) cerebral hemispheres of straight men and gay women tend to be of different sizes.

**Androphilic** (attracted to men) cerebral hemispheres of gay men and straight women tend to be of the same size.

High levels of **androgens** (a male sex hormone, such as testosterone) in the womb may predispose the fetus, whether male or female, to become an androphilic adult.

Balthazart (2018) research suggests that a mother's immune system may play a role in determining her male child’s sexual orientation. What could change an immune system? Stress and malnutrition are candidates.

Any nurture involved? Yes. Children who engage in gender nonconforming behavior are significantly more likely to become gay, lesbian or bisexual adults.

Some signs of sexual orientation are observable long before people begin to experience sexual attraction around the age of ten.
Nature or Nurture?

- Psychoanalytic theories stressed upbringing; research however has failed to identify any aspect of parenting that has a significant impact on a child's ultimate sexual orientation. (Bell, Weinbery & Hammersmith, 1981).

- Children raised by homosexual couples or heterosexual couples are equally likely to become heterosexual adults. (Patterson 1995).

- There is little support for the idea that a person's early sexual encounters have a lasting impact on their sexual orientation. (Bohan, 1996).

- Biology appears to play the major role. Gays have a larger proportion of gay siblings than do heterosexuals (Bailey et al., 1999). An identical twin of a gay man has a 50% chance of being gay; a fraternal twin has a 15% chance. A similar pattern has emerged in the studies of lesbians.

- Fetal environments also play a role. High levels of androgens in the womb predispose a person to be attracted to women, whether they are hetero males, or lesbians. (Meyer-Bahlberg et al., 1995).

- Brains structures of gays and lesbians tend to look like the structures of members of the opposite sex. The two hemispheres are unequal in size in hetero males and lesbians, but equally sized among straight women and gay men. (Lindstrom, 2008).
Are adolescent problems inevitable?

- Research suggests that the 'moody adolescent' who is the victim of 'raging hormones' is largely a myth.

- Adolescents are no more moodier than children (Buchanan, Eccles & Becker, 1992).

- Their hormone levels have only a tiny impact on their moods. (Brooks-Gunn, Graber & Pakoff, 1994).

- The hijinks of adolescence are temporary, and in some cultures, they barely occur at all. (Epstein, 2007).

- But, peers affect decision making. Adolescents make better decisions when no one is around. Participants in one study played a video driving game with or without peers in the room. The presence of peers greatly increased the number of risks taken, and crashes experienced by adolescents, but had little or no effect on adults. (Gardner & Sternberg, 2009).

- Did any psychologist in the past have a good predictive model of adolescent behavior? Yes. Study Table 11.2 Erikson's Stages of Psychosocial Development for next exam.
Teenage Sex: What Do Parents Think?

The percentage of Canadian teenagers who engage in sex has been declining in recent years. (Rotermann, 2008).

- Sex education in the schools seems to be the cause. (Mueller, Gavin, & Kulkarnin, 2008).
- Studies have shown that young women vaccinated for the papilloma virus do not have sexual intercourse earlier than those who do not. (Bednarczyk et al., 2012).
- Erikson's Stages of Psychosocial Development will be on the next exam.
- Adolescents and their parents have surprisingly few conflicts, and usually over minor matters. (Chung, Flook, & Fuligni, 2009).
- Adolescents pull away from their parents, and toward their peers. (Weisfeld, 1999).
- Throughout adolescence, people spend increasing amounts of time with opposite-sex peers while maintaining the amount of time they spend with same-sex peers. (Richards et al., 1998).
- As they age, adolescents show an increasing tendency to resist peer pressure. (Steinberg & Monahan, 2007).
- Those rejected by their peers tend to become withdrawn, lonely, and depressed. (Pope & Bierman, 1999). This changes as adolescents age, become more tolerant of differences.
Adulthood

- The stage of development that begins around 18 to 21 and ends in death. From an evolutionary psychology point of view, however, an adult is an infant's way of making another infant.

- Fig. 11.5 Age Related Changes in Cognitive Performance will be on the next exam. Study Focus on WM, LTM and STM.

- Adulthood is a period of life that is characterized by unanticipated change. Change slows but never stops, and its pace is faster than we expect.

- The physical peak occurs in the early 20s, and the slow decline begins between 26 and 30. After this age, you will lose one pound of muscle, to be replaced with fat. Sensory abilities will decline, and brain cells die off faster.

- It is important to note (from an evolutionary perspective) that the normal human life span, up until the last 100 years was 32 for men, and 28 for women.

- On the positive side, there is greater resistance to colds and flu. In Canada, 84% of men and woman will reach age 65.

- Prefrontal cortex and subcortical connections deteriorate with age. Episodic memor declines, but not semantic memory; working memory, but not long-term memory.

- Older adults, however, improve their strategies to maintain performance. (Blackman & Dixon, 1992).
Division of Labour

• As the brain ages, it becomes de-differentiated. (Lindenberge & Baltes, 1994).

• When young adults try to keep verbal information in working memory, the left prefrontal cortex becomes more strongly activated than the right; the opposite happens for spatial memory. (Smith & Jonides, 1997).

• Bilateral symmetry largely disappears in older adults; it suggests that older brain is compensating for declining abilities in each neural structure by calling in other neural structures to help. (Cabeza, 2002).

• Fig 11.16 'Bilaterality in Older and Younger Brains' will be on the next exam.
Changing Goals & Roles

- **Socioemotional selectivity**: young adults are largely motivated toward the acquisition of information that will be useful to them in the future; older adults are oriented towards information that is emotionally satisfying. (Carstensen et al., 2000).

- Memory generally declines with age, but the ability to remember negative information—declines much more quickly than the ability to remember positive information. (Carstensen et al., 2000).

- Older adults are better at sustaining positive emotions and curtailing negative ones. (Isaacowitz, 2012); they also express fewer negative ones.

- Does marriage make one happier, or do happier people get married? (Lucas et al., 2003).

- Children do not increase parental happiness (Senior, 2014) ; they may decrease it.

- Death: The Singularity is near; death will be a very different thing by 2045.