PSY1102
Introduction to Applied Psychology

Class 4
Nature-nurture and diversity (concluded), development

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Agenda for today

1. Gender development
   a. Gender similarities and differences
   b. The nature of gender
   c. The nurture of gender
2. Reflections on nature and nurture

<u>Development through the life span</u>

3. Prenatal development and the newborn
   a. Conception
   b. Prenatal development
   c. The competent newborn

1. Gender development

a. Gender similarities and differences

b. The nature of gender: our biology

c. The nurture of gender: our culture

1a. Gender similarities and differences

- Human males and females are genetically identical except for one of the 46 chromosomes we possess.
- Given this, it is not surprising that males and females are objectively very similar in terms of physical characteristics and mental capabilities.
- However, just as left-handed and right-handed people differ, differences exist between males and females.
- There are two major difficulties in characterising these differences:
  - avoiding stereotypes and preconceptions, ensuring that we rely on evidence, and
  - somewhat related, observing rather than comparing behaviours and attitudes to societal norms.

1a. Gender similarities and differences (cont'd.)

- The text lists (p. 157) several objective differences between males and females. On average:
  - Girls enter puberty earlier than boys;
  - Women live longer than men;
  - Women's bodies contain more fat, including subcutaneous fat;
  - Women's bodies weigh less and are shorter than men's;
  - Women's bodies have 40% less muscle than men's bodies.
- Also, there are gender differences in terms of some sensory capabilities, emotional expression, and frequency of psychological disorders.
  - As an example, because colour blindness is linked to the X chromosome (of which males have only one), colour blindness is much more common in males (8%) than in females (0.5%).

1a. Gender similarities and differences (concluded)

www.youtube.com/watch?v=Doz5w2W-jAY

1a. Gender and aggression

- Both genders engage in violent crime, but the arrest rate for – and by implication the prevalence of – male-initiated violence is many times higher than for female-initiated acts.
- In Canada (1997-2006), 69.5% of homicide victims were male and 30.5% were female. Of persons accused of homicide, 88.5% were male and 11.5% female (www.statcan.gc.ca/pub/85-002-x/2008009/article/t/5800418-eng.htm).

Category of homicide*	Percentage
Male offender, male victim	65.3%
Male offender, female victim	22.7%
Female offender, male victim	9.6%
Female offender, female victim	2.4%

* US Bureau of Justice Statistics, http://bjs.ojp.usdoj.gov/content/homicide/gender.cfm

1a. Gender and aggression (continued)

- Men tend to engage in, and to be more supportive of, war than women.
  - In the play *Lysistrata*, written by Greek playwright Aristophanes and first performed in 411 BCE, women refused to have sex with their husbands until a truce was struck in the Peloponnesian War.

1a. Gender and social power

- Who has more social power: males or females?
- Statistically, the answer is clear:
  - About 90% of corporate leaders (CEOs and members of boards of directors) are men, even in cases where there are an equal number of men and women entering the workforce;
  - The vast majority of national leaders are (and have been) male;
  - Men get paid more than women for the same work (19.9% more in the UK: www.guardian.co.uk/news/datablog/2011/mar/08/international-womens-day-pay-gap).

1a. Gender and social power (continued)

- Historically, the answer is also clear. In Canada*:
  - Women were first granted the right to vote in federal elections in 1917 (women in military only);
  - In 1918, all women 21 or older were allowed to vote;
  - In 1919, women were eligible for election to the House of Commons;
  - In 2011, 28.5% of candidates for the House of Commons were women, and 24.7% of those elected were women.
- However, as a curiosity check out "Meghalaya, India: Where women rule, and men are sufragettes" (www.bbc.co.uk/news/magazine-16592633).

* Source: www.elections.ca/content.aspx?section=vot&dir=bkg&document=ec90785&lang=e

1a. Gender and social connectedness

- The text provides a good summary of gender differences in social connectedness (pp. 158-160), including:
  - Independence vs. interdependence;
  - Competition in play and at work;
  - Communication styles (sharing vs. solving); and
  - Other comparisons.

1b. The nature of gender: our biology

- What is gender? On the one hand, gender is defined by our chromosomal make-up (with associated reproductive organs and secondary sex characteristics):
  - Males have one X and one Y chromosome
  - Females have two X chromosomes
- Fetal development can be disturbed by hormonal variations. For example:
  - An excess of testosterone can create genital abnormalities in female fetuses, as well as more masculine behaviour as children;
  - Exposure to DES (diethylstilbestrol) in utero is associated with vaginal cancers in "DES daughters" and genital and some psychological disorders in "DES sons" (www.cdc.gov/des/consumers/about/index.html).

1b. The nature of gender (continued)

- In normal development, parents are often surprised to find that their children gravitate towards “traditional” rather than “enlightened” toys:
  - Boys choose trucks over dolls
  - Girls choose dolls over trucks

- Similar patterns can be observed in other primate species. However, these preferences can be changed by prenatal exposure of females to testosterone.
- In the past, some children born with genital abnormalities had gender-reassignment surgery, but because of mixed success this is no longer as acceptable.
- Gender identity is not strictly tied to physical characteristics.

1c. The nurture of gender

- What are the cultural influences on gender?
- In some societies, gender roles are tightly defined. In Western societies, a less directive (or more open) approach is used.
- However, different cultures have expectations about how men and women should behave, and even in "open" societies reactions can vary.
- A key question is this: are gender roles determined biologically or culturally? Given the near-universality of some roles (e.g., home-making by women), one might be tempted to argue for biological determinism.
- However, changes in employment, university attendance, and other social conventions argue for a less deterministic approach.

1c. The nurture of gender (continued)

- One indication of the relative roles of biology and culture in defining gender roles comes from studies of immigrants.
- These studies are analogous to adoption studies in the nature-nurture debate, because immigrants leave one culture and are "adopted" by another.
- Although the parents of the immigrant family may adhere to familiar traditions, the first generation of children will adopt more of the traditions of the culture in which they are raised.

2. Reflections on nature and nurture

- It is simplistic to assume that humans are defined exclusively by nature (genetic influences), and it is just as simplistic to assume that we have unlimited flexibility in a “be all you can be” culture.
- Genetics imposes constraints on us; for example, we only have two arms, and we only see in a limited portion of the electromagnetic spectrum.
- However, genetics also confers flexibility on us in terms of adaptability and intelligence; the tools we develop and the research we conduct can lead us to new capabilities beyond those of our physical bodies.
- Culture provides a comforting “cocoon” which provides security by helping us understand what is expected, but progress is typically made by breaking these expectations.

DEVELOPMENT THROUGH THE LIFE SPAN

- As noted in the text (page 168), three "global" aspects of developmental psychology are of continuing interest:
  - Nature and nurture: what are the relative roles of genetics and the environment in forming a human being?
  - Continuity and stages: do humans follow a smooth developmental process (like a ramp), or is development more like a staircase, where functionality is added (or subtracted) in discrete steps?
  - Stability and change: do the personality traits we have early in life stay with us through life, or do we change substantially as we get older?

3. Prenatal development and the newborn

a. Conception

b. Prenatal development

c. The newborn

3a. Conception

- We all understand in theory that conception involves the merging of a sperm with an egg. This is our objective knowledge.
- However, the subjective experience is quite different.

3a. Conception: timing

- Unlike humans, many mammalian species only mate when the female is fertile.
- When a non-human female becomes fertile, conspecific males detect olfactory cues related to genital secretions.
- In mammals and other species (e.g., some insects), these chemical cues are a powerful stimulus; males of some species will travel many kilometres to find a fertile female (check out the silkworm moth and bombykol).
- Because the female only secretes the attractants when she is fertile, this mechanism helps ensure that the male inseminates the female at a time when there is a good chance of fertilising the egg(s), initiating conception.

3a. Conception: the male role

- At puberty, human males begin producing sperm, which they will do for the rest of their lives.
- In general, males can mate with females at any time.
- If the male is fertile, he is capable of fertilising an egg of a fertile female.
- Once deposited in the vagina, the sperm must swim into the uterus and towards the fallopian tubes to reach an egg.
- Because sperm have a limited life span, intercourse (mating) must occur within a limited time before fertilisation. If it happens too soon, the sperm will die before encountering (and fertilising) the egg.

3a. Conception: the female role

- At puberty, human females begin having menstrual cycles.
- This cycle lasts roughly 4 weeks on average, during which an ovarian follicle ripens and then ruptures and releases an egg.
- The egg travels from an ovary through a fallopian tube and enters the uterus.
- The lining of the uterus has been thickening in preparation for implantation of a fertilised egg.
- If the human female has mated with a fertile male, the egg may get fertilised in the fallopian tube or uterus; this is conception.
- The egg then implants in the uterine wall.
- If the egg is not fertilised, the egg is shed along with the lining of the uterine wall during the menstrual period, and the cycle starts all over.

3a. Conception: timing conception

- In several non-human mammals, chemical cues attract the male to a receptive female to increase the chances of conception.
- Moreover, in many species these cues occur at a time that helps ensure that offspring will not be born in the dead of winter, when the likelihood of survival of the offspring would be reduced.
- Before the advent of the birth control pill in the 1960s, humans often tried – with mixed success – to regulate conception by use of the rhythm method, avoiding intercourse when conception was most probable.
- Of course, if conception is the goal then the opposite approach is used.

3b. Prenatal development

- In humans, gestation (pregnancy) normally lasts 38-39 weeks.
- During pregnancy, the embryo develops in the mother's uterus, eventually becoming a fetus around 9 weeks.
- In the later stages of prenatal development the fetus is responsive to its sensory environment:
  - the fetus hears the mother's voice and responds to sounds;
  - the fetus's visual system cannot detect patterns, but can discern light and dark;
  - expectant mothers often feel that their fetuses respond to certain foods that the mother consume.

3b. Prenatal development: risk factors

- There is a long list of factors that can influence prenatal development (that is, during pregnancy), including:

Factor	Consequence
Alcohol consumption	Attraction to alcohol; fetal alcohol syndrome (FAS)
Smoking	Reduced oxygen, increased carbon monoxide, underweight at birth
Addictive drugs	Addiction in utero (e.g., opiates)
HIV/AIDS	Born with HIV/AIDS
Teratogens (e.g., thalidomide)	Deformities of limbs, etc.

- Sexual activity during pregnancy does not affect the fetus.

3c. The newborn

- Many people believe that newborns are delicate creatures who need to be shielded from the harsh world.
- However, the act of being born subjects the newborn to physical stresses that are unlikely to be matched (or survived) in older years.
- In addition to the physical trauma of birth, the infant's world changes from a cramped, fluid-filled, warm, dark, and largely quiet chamber to a cold, bright, noisy, wide-open, air-breathing world – and all of this in the space of minutes.

3c. The newborn (continued)

- Most mammals are pre-programmed (genetically) with a set of reflexes to help ensure survival. For example:
  - Rooting reflex: here, the infant turns towards a stimulus on a cheek, open its mouth, and roots for a nipple;
  - Sucking reflex: when the nipple is located, the infant begins to suck;
  - Because air and food cross paths in our pharynx and must go into separate "pipes", breathing and swallowing reflexes are coordinated;
  - Crying reflex: when a drive is unsatisfied or environmental conditions are not optimal, the infant will cry, drawing the attention of the parent.

3c. The newborn (concluded)

- For psychologists, studying the behaviour of infants is a challenge, because many behaviours are reflexive.
- Likewise, trying to characterise the cognitive processes of an infant is challenging.
- Over the past few decades, researchers have relied on habituation as a tool to study infant behaviour.
  - Habituation is not limited to infants, but is seen in all mammals. Imagine that someone claps their hands loudly behind you; the first time they do it, you'll jump reflexively, but as they continue to do it your reaction becomes more moderated as you habituate to the stimulus.
  - The habituation response has been used to determine the infant's ability to detect novel stimuli and to differentiate between stimuli.

Class 4: Summary

- We have now finished the nature-nurture part of the course, although this topic will surface again, because it is an ongoing theme in psychology.
- As part of nature-nurture, we looked at gender and gender roles.
- Finally, we began the section on development, looking at stages from conception to infancy, including research tools to help us conduct research with non-verbal infants.