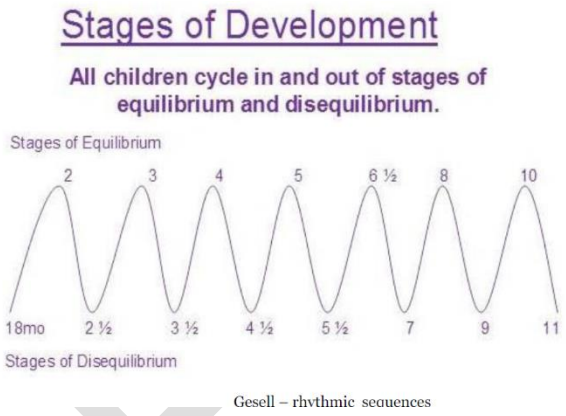
# Developmental psychology

## Week 1 – introduction to developmental psychology

- Defining development
  - Systematic changes & continuities in the individual that occur between conception and death
- Goals of developmental psychology
  1. To describe
     - Normal development
     - Individual differences
  - **<u>Normative descriptive approach</u>**
    - Careful systematic observations of children
    - Maturational theory → genetic determinants
      - Largely invariant (universal) sequences
      - Cycles 'better'/'worse' phases
    - Provides descriptive age-norms
      - E.g. walking: nature→ universal? Innate? Not learned?. Varied environment → shoes? Fitness? Cultural norms?




  2. To explain
     - Individual differences
  - Positive change → growth in competence or capacity
  - Negative change→ loss of competence or capacity
  - Change can be:
    - **Quantitative- more/less** (height, speed, vocab, visual acuity)
    - **Qualitative-doing things differently** (motor, language, thinking)
      - Sitting- crawling-walking
      - Thinking-reorganisation of thought and action e.g. mentally representing objects and words
  - **Normative change-universals**
    - General changes in behaviour across ages that virtually all children share
    - Developmental milestone: walking, first words
  - **Idiosyncratic- individual differences**
    - Variability in when/how universal developmental milestones are achieved
      - Rate of development
      - Sequence of development
      - Style of responding / learning
  3. To optimise
     - To make a difference to peoples live trajectories
     - Developmental theory can influence policy oriented action e.g. carer/child ratios in childcare
     - evidence based theoretically grounded interventions can make a difference. → problems that confront our society are intergenerational
- Developmental process
  - **Maturation→** the biological unfolding of the individual according to plan contained in the genes- nature
  - **Learning→** the process through which **experience** brings about relatively permanent changes in thoughts, feelings, or behaviour- nurture
  - **Epigenetics→** process through which experience and environment can influence gene expression
    - **Interventions→ make changes to the environment. Interplay of nature vs nurture**
  - What causes developmental change? Theory as a lens

- Nature/nurture
- Example: child having problems at school
- Stance determines approach to children
  - 'Nature' – child centred - guided by child readiness – eg., Piaget
  - 'Nurture' – directive approach – adult led – eg., Vygotsky
  - Eclectic position – interactions between the two
  - Social/Context focus – how does the culture of the school match the culture of the family?
  - What demands does the culture make? What do people need to know to flourish in a particular culture?

❖ Developmental theories

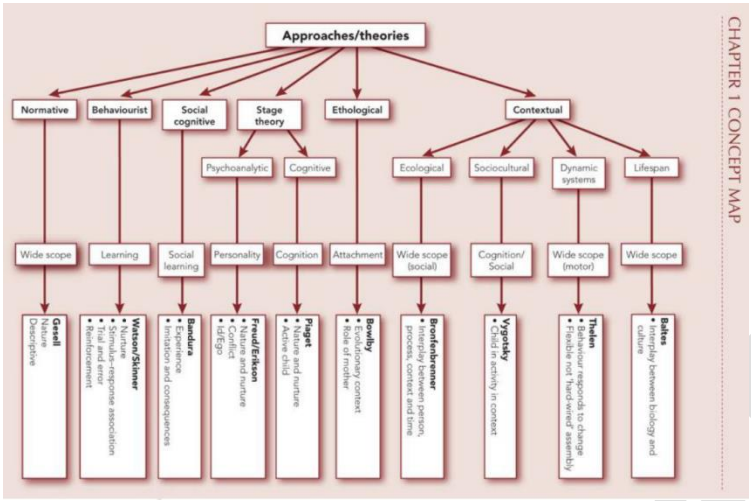



TABLE 1.4 Comparison of developmental theories

| Theoretical perspective | Nature versus nurture | Continuous versus discontinuous | Universal versus culturally specific |
|---|---|---|---|
| Normative-descriptive (Gesell) | Nature – maturation determines development | Discontinuous – maturationally determined cycles of behaviour (qualitative differences) | Universal |
| Psychoanalytic (Freud/Erikson) | Interaction between nature and nurture – innate impulses directed by child rearing | Discontinuous – psychosexual/ psychosocial stages of development (qualitative differences) | Universal |
| Piagetian | Both nature and nurture – maturation determines structures, but experience vital | Discontinuous – stages of cognitive development (qualitative differences) | Universal |
| Behaviourism (Watson/Skinner) | Nurture – development results from conditioning | Continuous – no stages (quantitative change) | Culture-specific – individual differences emphasised |
| Social cognitive (Bandura) | Nurture – modelling and reinforcement | Continuous – no stages (quantitative change) | Culture-specific – individual differences emphasised |
| Ethological (Bowlby) | Both – emphasis on nature, but nurture (early experiences) influences later development | Discontinuous but no stages of development – critical/sensitive periods emphasised | Universal |
| Ecological (Bronfenbrenner) | Emphasis on nurture, but recognition of biological effects | Not specified – change emphasised more than stability | Culture-bound principles |
| Sociocultural (Vygotsky) | Interactionist – both biology and experience important | Both – continuous change results from interaction with adults; language acquisition results in stage-like change | Culture-bound principles |
| Dynamic systems (Thelen) | Both – inherited and experiential factors form an integrated system | Both – change is continuous but stage-like changes occur with reorganisation of the system | Both cultural universals and culture-bound changes |

➢ Baltes: an overarching & integrative theory
- Development involves age-related change in adaptive capacity
- 7 assumptions about development
  1. Lifelong process
  2. Multidirectional
  3. Involves both gains and losses at every age
  4. Lifelong plasticity → change in response to a positive and negative experiences
  5. Historically embedded (cohort effects)
  6. Contextualism as a paradigm (cultural effects)
  7. Understanding development requires multiple disciplines
- Individuals respond to and act on contexts:
  - Physical environment / context
  - Historical context
  - Social context
  - Cultural context
- Contextual influences

**Normative age-graded influences**

- Biological & environmental influences that are similar for individuals in a particular age group (in a particular context, at a particular time)
  - Puberty

- Menopause
- Entry into school
- retirement

**Normative history-graded influences**

- Common to people of a particular generation because of the historical circumstances they experience
  - Economic boom
  - Ww1
  - Baby Boomers
  - 9/11
  - Millennials
- Major source of influence during adolescence and early childhood

**Non-normative life events**

- Unusual occurrences that affects an individual but do not have a broader influence
  - Major accident
  - Death of a parent
  - Winning the lotter
- Sources of such influences increases the lifespan → **developmental pathways more varied after childhood**

➢ Age as an explanatory variable?
- Lifespan definitions are culturally and historically constrained
- Different age-grades/norms in different cultures, cohorts
  - Physical/biological age
  - Psychological age
  - Social age

➢ Conceptualisations of age
- Chronological age → number of years since birth
- Biological age→ age in terms of biological health
- Psychological age→ an individuals adaptive capacities compared to others of the same chronological age
- Social age → social roles and expectations related to a persons age

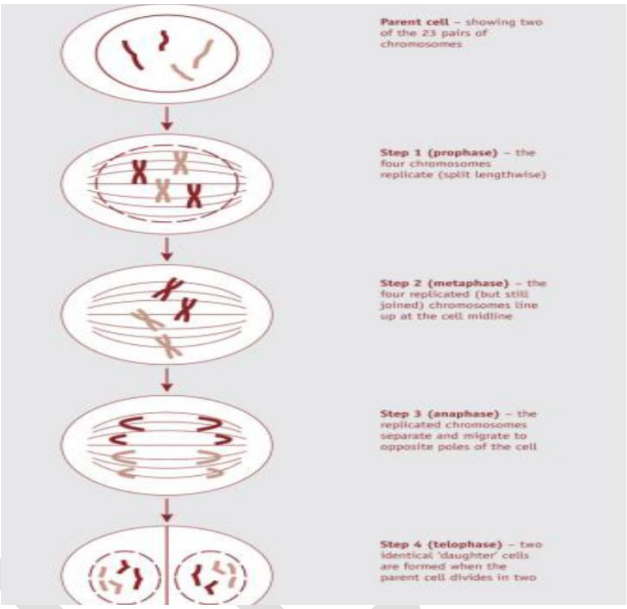
➢ Example: child behaviour
- Microsystem- the home
  - E.g. martial conflict & discord parents→ positive & negative interaction with children→ negative child behaviour→ marital discord
- Mesosystem-neighbourhood – community
  - E.g. quality of local playgroup, childcare centre will influence parenting capacity (indirect effect) and child behaviour (direct effect)

# Week 2- Genes, Environment & prenatal development

**Genes & environment: individual differences**

➢ What are genes
- Units of hereditary information-"blueprint" for a structure or the 'recipe' for encoding a process
  - Genome is an algorithm or code
- Comprised of sort segments of DNA
- Genes (in pairs, one from each parent) are carried on chromosomes (n=46)
  - (23 pairs- 22 pairs of autosomes, 1 pair of sex chromosomes XX or XY)

- Individual heredity
  - Mitosis→ normal cell replication for somatic reproduction (skin, blood, muscles)
    - Single cell divides and replicates resulting in 2 identical cells
    - Each cell contains 2 sets of chromosomes
    - Growth, repair of aging tissues, skin
  - Meiosis→ special process of cell division for sexual reproduction
    - Chromosome pairs come together- crossing over occurs→ mixing genetic information from 2 chromosomes of the 2 parents
    - A 2nd division sequence occurs producing 4 cells each with ½ number of chromosomes of the original cell
    - Occurs prior to formation of sperm (males) ova (females)
    - Cells return to having the usual 'pair' of chromosomes after fertilization-sperm cells meet egg cells to produce a different genetic combination
    - Each chromosome in the egg (ova) and sperm cell is a unique mixture of maternal and paternal DNA
  - Mutations→ errors in the process of meiosis or mitosis mean that chromosomal mutations can occur
    - Inversions, deletions, duplications, translocations



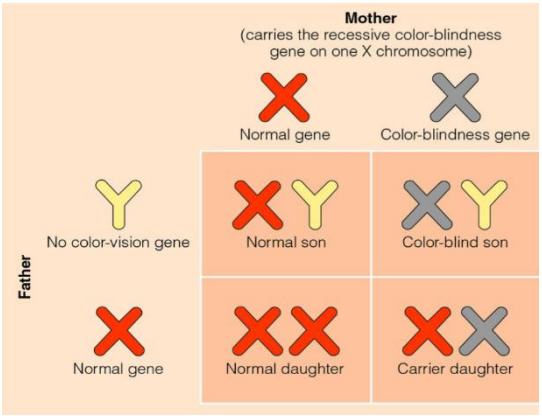

**Basic genetic principles**

- Dominant-recessive gene principle (the case of singe gene-pair inheritance)
  - There are 2 hereditary elements for each trait
    - 1 from the male parent
    - 1 from the female parent
  - These 2 alternate forms of the same gene are called "ALLELES"
  - One dominant allele can override the effect of the other recessive allele
    - Recessive genes are only expressed if both parents carry the recessive gene – i.e there are 2 recessive genes
  - Gene for brown eyes (B) is dominant over the gene for blue eyes (b)
    - Genotype→ genetic constitution BB, Bb, bB, bb
    - Phenotype→ observable characteristic = eye colour

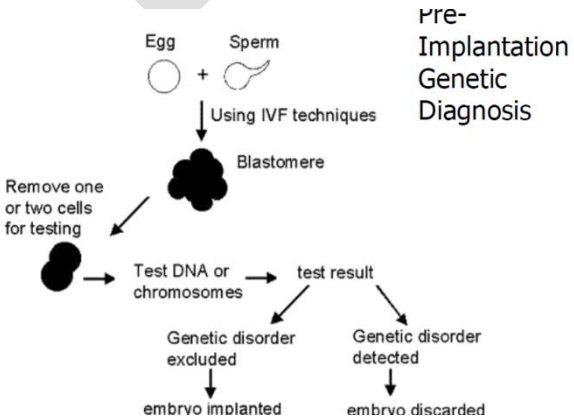
- BB = brown eyes (homozygous)
- Bb = brown eyes (heterozygous)
- bB = brown eyes (heterozygous)
- bb = blue eyes (homozygous)

- Genetic disorders
  - Some disorders carried on dominant gene→ expressed in every individual carrying the allele e.g. Huntingdon's disease→ strikes after 40 yrs (1/2 chance of inheritance)
  - Some are carried on recessive gene e.g. Cystic Fibrosis; both parents have to carry the gene- there is a 1 in 4 chance of inheritance- (similar to eye colour example)
  - CO-dominance→ effect of recessive gene is not totally masked – so phenotype is a compromise
    - AB blood type
    - Skin colour (black+ white= light brown)

- Sex linked inheritance
  - Some traits are influenced by single genes that are located on the sex chromosomes
  - Typically "x-linked" (recessive)
    - These traits more likely to achieve expression in males – why?
    - Red-green colour blindness
    - Haemophilia
    - Certain forms of deafness
    - Duchenne muscular dystrophy




- Chromosomal abnormalities
  - Child may receive too many or too few chromosomes (or abnormal/damaged chromosomes) mostly due to problems during meiosis chromosomal abnormalities are the main cause of spontaneous miscarriage
    - Down syndrome trisomy 21
    - Edwards syndrome trisomy
    - Turner syndrome
    - Klinefelter syndrome
- Prenatal diagnosis & genetic counselling
  - Ultrasound- routine
  - Maternal serum blood tests
  - Chorionic villus sampling
  - Nuchal translucency scan
    - Fluid at back of neck
    - 11-13 weeks
    - Relative risk only
  - Amniocentesis




- Polygenic inheritance
  - Many genes interact to produce a particular characteristic
  - Human genome project- humans have 30000 genes
  - Reaction range→ a range of possible phenotypes for each genotype
  - Genetic potential for high IQ
    - Restricted environment IQ=80
    - Enriched environment IQ= 150
  - Genetic potential for average IQ
    - Restricted environment IQ = 50
    - Enriched environment IQ= 108

**<u>Studying gene environment interactions</u>**

- Research with animals & with plants and crops cant be used with humans
  - Experimental breeding→ animal models
  - Selective breeding→ for heritable traits (e.g. activity level, wool types) selectivity mate animals exhibiting that trait
  - Genetic manipulation / editing→ insert a particular variant of a normal gene in cells or "knockout" a normal gene- compare these experimental animals with control animals to determine the function of the manipulated genes
- Gene-environment contributions in humans
  - Kinship studies→ e.g bipolar disorder, schizophrenia
  - Adoption studies
  - Twin studies→ identical vs fraternal, twin/adoption designs
- Estimating genetic & environmental influences

- Human research: kinship studies
  - Compare relatives vs. unrelated people
- Twin study methodologies
  - Same environment→ in what ways are identical twins more similar than fraternal twins?
  - Different environment→ identical twins separated near birth particularly informative
- Fraternal & identical twins
  - Identical twins- one fertilized ovum divides to form genetically identical individuals
  - Fraternal twins- 2 ova are released at the same time- each is fertilized by a different sperm
  - IVF & twins
    - Mostly fraternal- baby gammy case
    - Changes in practice- fewer twins in recent years
- Twin study designs
  - What can we learn by comparing identical twins (MZ)& fraternal twins (DZ)
    - MZ share 100%
    - DZ share 50% of genes (like siblings)
  - For traits influenced by heredity, MZ twins will be more similar than DZ twins. For height:
    - MZ correlation is .86
    - DZ correlation is .45
  - Limitations of twin 'designs'
    - Naturalistic cant systematically vary the environment
      - Cant randomly allocate to different environments
      - Cant' remove one twin experimentally
    - Questions the assumption that diversifying influences of environment are no greater for fraternal than identical twins
      - Parents who think twins are monozygotic or vice versa
- Adoption studies
  - Shared heredity→ genetically related individuals separated and reared in different environments- how similar are they? What does this tell us?
  - Shared environment→ genetically unrelated individuals reared in the same environment
  - Critical thinking
    - Children are not randomly allocated
      - Bias in placement with 'similar' parents
      - Meeting criteria for eligibility- screening
      - 'wanted' children adds value to environment

➢ Epigenetics
- Changes in phenotype (appearance) or gene expression cam be caused by mechanisms other than changes in the underlying DNA sequence- instead, **non-genetic factors can cause the organisms genes to behave differently**
- Genes & environments do not make separate contributions to the phenotypic outcomes of behaviour
- Normally occurring environmental events influence gene activity- 'turn genes on'
- Genes are adaptively responsive to their internal (cellular) and external (nutrition, stress) environments

➢ Timing of genetic influences
- Genes do not complete their work before birth. They provide potentials:
  - Turn on and turn off in patterned ways throughout lifespan
- Passive→ child passively receives correlated genes and environments
  - E.g. musical parents provide both genes & a musical environment
- Evocative→ child elicits reactions from parents that lead them to provide environments correlated with the child's genes
  - E.g. parents notice musical ability in child and respond by providing input to foster that ability

- Active→ (niche picking) child's genes lead them to actively seek out correlated environmental experiences
    - E.g. musical child seeks to go to conservatorium for high school