

PSYC2213 EXAM NOTES

LECTURE 1 – Development

1. Why is it important to study development?

- 1) It can provide a complete understanding of human behaviour with its changes across the lifespan; 2) it can help identify the best family and social systems for raising healthy, happy children; and 3) it can potentially counteract conditions contributing to abnormal development by understanding the factors contributing to healthy development.

2. What are the key issues that need to be addressed in studying development?

- The first issue involves questioning **how nature and nurture shape development**. **Nature** is a child's biological make-up, whereas **nurture** is a child's physical, social, and cultural experiences. There is no simple answer regarding the relative contributions, as both genes and the environment contribute to development (often in interaction).
- The second issue involves questioning whether **children shape their own development**. **Piaget's constructivist position** proposes that children acquire knowledge through self-discovery by interacting with their environment e.g. since attention is selective, infants' preferences can tailor their early experiences.
- The third issue involves whether **development is continuous or discontinuous**. Stage theorists propose that development is **discontinuous** i.e. that children's thinking undergoes a qualitative change from one stage to another. Other theorists argue that development is **continuous** i.e. there is progressive expansion in the child's knowledge/skills without any major reorganisation.
- The fourth issue involves questioning **what the sources (mechanisms) of change are**. The mechanisms that produce include basic learning mechanisms, along with the development of information processing capacity and effortful attention.
- The fifth issue involves **how social and cultural contexts influence development**. There are various influences, including interactions in the immediate environment (e.g. family), the media, economic factors, and cultural beliefs and values.
- The sixth issue involves questioning **how children develop so differently**. Individual differences in development reflect genetic differences, differences in caregivers' support and interaction, and children reacting differently to similar experiences.
- The final issue involves questioning **how can research promote children's well-being**. Research can enhance wellbeing by providing information to parents, assisting with optimising education systems, and guiding intervention programs.

3. (i) Describe and give examples of the major types of design used in developmental research

(ii) What are the strengths and weakness of longitudinal designs?

(iii) What are the strengths and weakness of cross-sectional designs?

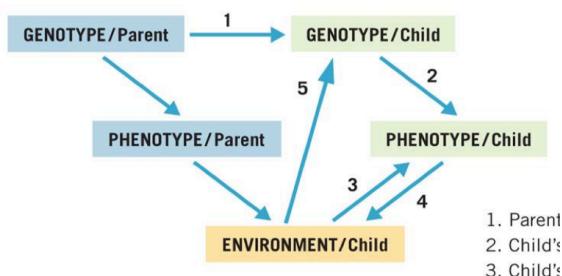
(iv) What are the strengths and weakness of the microgenetic method?

- **Longitudinal designs** study the same group of individuals repeatedly at different times. There are two types: **1) prospective**, which involves recording behaviour working forward in time (e.g. assessing delinquent behaviour in 2017 and 2019), and **2) retrospective**, which involves working back in time (e.g. asking for delinquent behaviour reports for 2013 and 2015). **Advantages** include analysis of within-individual changes (e.g. stability/variability of behaviour), and providing information on causality. **Disadvantages** include it being time-consuming, costly, and results possibly being limited to a single cohort. By contrast, **cross-sectional designs** involve collecting data on individuals of different ages (e.g. 3, 6, and 9 year olds) at roughly the same point in time. **Advantages** include it being cheap, quick, and avoiding bias due to attrition. **Disadvantages** include it being difficult to establish causal relationships, and individual differences in the rate/nature of change cannot be assessed. Lastly, **the microgenetic method** is an intensive study of a particular area of change as it is happening. There are 3 characteristics: 1) the observation period spans the beginning of rapid change to stable use of the target strategy, 2) there is a high density of observations collected during this period, and 3) there is an intensive, trial-by-trial assessment of ongoing changes (qualitative and quantitative). **Advantages** include discovering the processes underpinning change, along with revealing variability in children's thinking. **Disadvantages** include it being time consuming and not providing information about typical patterns of change over long periods.

LECTURE 2 – Brain and Behaviour

4. Describe what is meant by genotype and phenotype. Explain how parental genotype and phenotype influences the child's phenotype.

- **Genotype** is the genetic material an individual inherits. By contrast, **phenotype** is the observable expression of the genotype. In the parent genotype-child genotype interaction, parents pass on 23 pairs of chromosomes, which contain segments of DNA known as "genes". Genes contain the code for protein production, and can influence a child's genotype through **(1) gene expression**, in which regulator genes control the activity of other genes; **(2) additive heredity**, in which the effects of certain genes add up to influence the phenotype; and **(3) dominant/recessive heredity**, in which dominant genes exert more influence than recessive genes. Furthermore, the phenotype of the parent can have an effect on the child's environment. Factors such as parental contributions, along with children being active creators of their environment (e.g. evoking certain responses from parents) can result in a child's genotype developing and being expressed differently (i.e. their phenotype).



5. Explain why x-linked recessive genes affect boys more than girls.

- Since males only inherit one X chromosome (and the X-linked gene almost never has a counterpart on the Y chromosome), they are much more vulnerable to inheriting x-linked recessive genes than females. This is because females inherit two X chromosomes, and hence inheriting the recessive alleles on both X chromosomes is very rare.

6. Explain the concept of heritability, with reference to estimates for IQ.

- **Heritability** is the proportion of measured variance for a trait among individuals in a given population that is attributable to genetic differences. However, heritability tell us nothing about group differences. For instance, racial differences in IQ are sometimes assumed to be genetically based; which is misguided given there are racial differences in income and education etc.

7. Describe the major methods used for investigating genetic influences on development.

- The **twin-study design** compares correlations between identical (monozygotic; MZ) and fraternal (dizygotic; DZ) twins. Identical twins have 100% of their genes in common, whereas fraternal twins are only 50% genetically similar. For twins reared together, the degree of environmental similarity (i.e. shared environment) is assumed to be equal. Furthermore, in the **adoption design**, researchers examine whether adopted children's scores are correlated more highly with those of their biological parents and siblings or with those of their adoptive parents and siblings. Genetic influences are inferred if children resemble their biological relatives more than their adoptive ones. Lastly, the **adoptive twin design** compares identical twins reared together and apart. If the correlations for twins reared apart are similar to those reared together, it suggests environmental factors have little effect. By contrast, if the correlations for identical twins reared apart are lower than those reared together, then environmental influence is inferred.

8. Explain the process of synaptogenesis and myelination in the developing brain.

- **Synaptogenesis** is the process of exuberant generation of neuronal connections. Excess synapses that are rarely activated are then selectively eliminated in a process known as **synaptic pruning**. By contrast, **myelination**, involves the formation of myelin (a fatty sheath) around the axons of neurons in order to speed-up and increase information-processing abilities.

9. Explain how synaptogenesis and pruning are advantageous for human development.

- **Experience-expectant brain function** involves brain functions that require certain basic, common experiences in order to develop (e.g. visual stimulation,

sounds, and movement). Synapses that are activated are strengthened, and those that are rarely activated are “pruned”. Without these experiences, development will be compromised.

10. Why do we need to use caution when inferring a relationship between characteristics of the brain, such as brain size, and behaviour?

- The relationship between biology and behaviour is complex. Identifying the genetic basis doesn't really explain behaviour, establishing that a particular area/characteristic of the brain is associated with a psychological trait doesn't really explain behaviour, the environment also influences brain structure, and establishing a 'cause' is difficult.