HOW EFFECTIVE IS THE GENETIC RESEARCH AND WHAT ARE ITS ETHICAL IMPLICATIONS?

1. **Assumptions** of genetic research:
   The mechanism of heredity applies both to characteristics from parents to children, as well as to the whole process of evolution (Darwin).
   Inherited factors influence behaviour and mental abilities.
   Genes need environment to actualise their potential.
   Some genes express themselves more directly (e.g. Huntington's disease) than others (e.g. Alzheimer's disease).

2. **Methods** of genetic research:
   - Family resemblance (concordance) studies – twin studies, adoptive studies – (-) natural experiments *(for detailed discussion – please look Glassman, p. 89).*
   - Molecular genetics – extracting and comparing genetic material from potentially comparable families – (-) possessing a given gene does not automatically mean its development.

3. Conclusion – variable effects of genes upon behaviour and methodological problems connected with the research imply that **special care needs to be taken** in how the knowledge is interpreted and used.

4. **Evolutionary psychology** – attempts to apply the concept of evolution in order to enhance our understanding to behaviour (Glassman, p.90-93). One area that has been hotly debated is the relevance of evolutionary interpretation of gender (e.g. courting and mate selection) (-) post hoc interpretations.

5. Despite the difficulties of conducting rigorous studies, concordance research has added to our knowledge on the role of heredity and environment in development (nativism – empiricism, **nature – nurture debate**). Modern psychologists largely accept the interactionist view (interwoven influences). Fields of research:

INTELLIGENCE

6. **Genetic studies in the past** – especially the infamous studies on intelligence. Research into genetic basis of intelligence was based on faulty assumptions and methodology, and was used for selection purposes. It was politically motivated, researchers were biased, family resemblance studies were poorly controlled and IQ tests were culturally biased. Eugenic policies led to social injustice and genocide. Early genetic researchers concluded that intelligence was inherited in 80%, which resulted in selection of employees and of immigrants, sterilization of those genetically "doomed to mental deficiency." A spectacular example is Yerkes' study of recruits in WWI, and his subsequent comparison of nations (Nordic > Latin&Slavic > Black American).

7. **More recent research** points to circa 50% inheritance of intelligence, the rest being attributable to womb, family, and society, e.g. SES). According to studies done by Bouchard and McGue (1981), IQ correlations for intelligence are the following:
   MT reared together – 0.85
   MT reared apart – **0.72**
   DT reared together – **0.60**

..which shows the significance of genes for intelligence. However, the very notion "apart" could be questioned – how different are the environments really?, and what about the womb / prenatal environment?

8. A lot is still to discover about genes, however. How genes really work on IQ remains a **mystery**. Possible answers are:

   - They affect speed of processing
   - The affect ability to concentrate
   - They enhance motivation to learn
   - They promote resistance to disease (- healthy brain)

9. In 1997, Robert Plomin questioned intelligence as a unitary phenomenon. He showed that twin studies correlations on verbal ability are higher than those on memory.

10. The significance of **environment** cannot be underscored:
    - 10 environmental factors (10 x 5points), e.g. mental health and educational level of the mother, presence of the father, etc. (Sameroff and Seifer, 81)
    - Operation Headstart (US, 1965)
    - Rosenthal and Jacobson's study on self-fulfillment in the classroom ('68)

11. With improved technology (e.g. genetic screening and gene therapy), **further ethical implications** arise, such as selection by employers, insurance companies, and parents. However, there is no doom in genes, and being predisposed / possessing a gene does not mean realizing it

SCHIZOPHRENIA

12. Apart form intelligence, genetic studies are carried out in relation to **mental disorders, e.g. schizophrenia –**

(1) family studies – if 2 parents are schizophrenic, there's 46% likelihood that a child will be, too.

(2) Twin studies – MT – 48% concordance rate; DT – 17%

However, **alternative explanations** / causes should be kept in mind – e.g.

- Biological - the dopamine hypothesis, enlarged ventricles
- Learning – labelling
- Cognitive – impairment of the attention filter (Frith)
- Psychoanalytic - family stresses (double bind communication)
- Viruses
- environmental triggers / stresses.

DEVELOPMENT OF PERCEPTION

13. **Human infant studies** – nature side (e.g. Bower's triangle – shape perception, Gibson and Walk's visual cliff – depth perception)

14. **Animal experiments** – nurture side (e.g. Riesen – light deprivation, Blakemore and Cooper – striped environment).

LANGUAGE ACQUISITION

15. **Chomsky's** innate approach (+ evaluation!):
    Surface and deep structure of the language
    Transformational grammar (rules to extract deep structure)
    LAD (language acquisition device)
    Linguistic universals (e.g. nouns, verbs)

16. **Skinner's** learning theory approach
    Operant conditioning
    Shaping

REDUCTIONISM DEBATE IN BIOLOGICAL PERSPECTIVE

1. **Controversies:**
   (+) parsimonious, analytical, scientific, easily tested;
   (-) oversimplified, low-level explanations, matter of validity;
   for more details on controversies – please look a copy from "....Diagrams".

2. **examples of reductionism in biopsychology – on physiological, neurochemical, or genetic levels :**

- **hunger** – e.g. hypothalamic, lipostatic, glucostatic theories – scientific and easily tested. (but: learning influence on feeling of hunger; also: other types of motivation such as need for achievement or for intimacy is not easily accountable in this way)

- **language** – e.g. localization of functions – Broca's area, Wernicke's area – easily verified (but: influence of family, education, social class on language)

- **schizophrenia** – e.g. dopamine hypothesis, larger ventricles, smaller frontal cortex (but: cause or effect?, social and family reasons, labelling, etc.)

- **aggression** – e.g. testosterone levels (but: it might be more useful the ask the functional question of what for people behave aggressively)

- **consciousness** – e.g. split brain studies by Sperry (but: the problem of validity here – is brain the same as mind? Meta / physical debate.)

- **dreams** – e.g. activation-synthesis theory or reverse learning theory (but: psychoanalytic therapeutical success with working on dreams, Freud's ideas).

- **phobias** – e.g. evolutionary explanation of biological preparedness (but: also conditioning, effect of environment on genes).

3. The opposites to reductionism are **holism** and **interactionism**. The former looks at higher levels of explanations; the latter shows how many aspects of a phenomenon or levels of explanation can interact together to provide a complete picture. E.g. humanistic psychology, social psychology, Gestalt.

4. **Other** types of reductionism:
   Behaviourism – stimulus-response learning units
   Traditional cognitivism – machine reductionism

EXPLAIN THE EXTENT TO WHICH FREE WILL AND DETERMINISM ARE INTEGRAL TO THE PERSPECTIVES.

1. **Free will** means being free to try to do something, to choose to do something. Will is a matter of intent. **Determinism** means that every effect has its cause; it cannot be equated with fatalism or destiny.

2. Arguments **for free will**:
   - Introspection and subjective impressions should be considered.
   - The very thinking you have free will influences your behaviour.
   - It is consistent with society's ideas of self-control and responsibility that underlie our moral and legal assumptions.
   - Determinism is unfalsifiable and, due to the vast complexity of influences upon behaviour, can never lead to complete prediction.

3. Arguments **against free will**:
   - It is difficult to define free will (self / soul / product of consciousness?)
   - Evidence is mostly subjective (Sic!)
   - Disturbing empirical studies – Libet, 85 – the brain processes that initiate the movement of a hand occur almost half a second before the moment a subject reports choosing to move it!
   - Incompatible with deterministic assumptions of science (causality)
   - Mental disorders – loss of control – are we on the same continuum?

4. <u>free will and determinism in biological perspective</u>

we are doubly determined – physiological determinism + genetic determinism;

physiological determinism – behaviour is determined by internal (biological) factors, e.g. brain structure and biochemistry.
- Motivation – physiological hunger theories, homeostatic drive theory – on the other hand, we choose to go on a diet (or do we...?)
- Emotions – LeDoux's theory – on the other hand, do we choose to fall in love?
- Gender development – biological and hormonal differences – on the other hand, sex isn't gender, social reinforcment, gender schemas

genetic determinism – advocated by ethologists – on the other hand, genes need environment to develop, and environment can change genes.
- innate altruism (kinship selection) – on the other hand, is counting on reciprocity really helping?
- Mental disorders – biological preparedness on phobias – on the other hand, phobias can be also learnt (conditioned).

5. free will and determinism in cognitive perspective

- **soft determinism** – we choose and decide within the limited repertoire we have;
- our freedom is **constraint** by our innate capabilities, previous experience, emotional attitude, motivation, cognitive load, perceptual set (:expectations), schemas
- techniques of research showing this – e.g. **priming** (semantic priming and affective priming; subliminal and controlled messages);
- **fields** of research as examples – **problem solving** (e.g. previous experience, functional fixedness, cultural influences), **perception** (e.g. physiological constraints, cultural influences), **attention** (e.g. motivation, emotional involvement, physiological limitations of sensory memory), **memory** (e.g. limited capacity of STM, influence of emotions on remembering and forgetting);
- W. **James** – there are high and moderate constraints, depending on situations, we are free from coercion, but not causation.

6. free will and determinism in learning perspective

environmental determinism – we are controlled by external forces

- according to behaviourists, we are determined by **rewards and punishments**;
- social learning psychologists will add **social models** we observe and imitate
- "**blank slate**" concept
- **Skinner**: "Free will is an illusion" – implications for psychology and societies: behaviour control, therapies, creating an ideal state and society (his book "Walden Two")
- **Watson**: "Give me a dozen of healthy infants ...")