

BIOLOGICAL APPROACH

Topic 3: Genetics and behaviour

Content: Genes and behaviour.

Key Idea: There is an interaction between genes and environment to affect human behaviour.

KEY STUDY: *Caspi et al. (2003) Influence of Life Stress on Depression: Moderation by a Polymorphism in the 5-HTT Gene.*

Brief Summary

Looked at the relation between inherited short alleles on the 5HTT serotonin transporter gene and incidences of stress and subsequent depression.

Links to:

- **Abnormal Psychology:** Genetic explanation for inherited predisposition to depression as a response to environmental stressors.

Aim

To investigate whether a functional change in the 5HTT gene is linked to a higher or lower risk of depression in an individual.

Participants

847 participants aged 26 years old split into three groups, depending on the length of the alleles on their 5HTT transporter gene.

Group 1 – two short alleles

Group 2 – one short and one long allele

Group 3 – two long alleles

Procedure

A number of methods were used to ascertain the link between length of allele, stressful life events and depression:

1. Stressful life events occurring after the 21st birthday and before the 26th birthday: assessed using a life-history calendar.
2. The Diagnostic Interview Schedule was used to measure the instances and frequency of depression over the past year per participant.
3. Correlational analyses were calculated between stressful life events and depression, length of alleles and depression and perceived stress and the length of alleles.
4. A further test was done to see if life events could predict an increase in depression over time among individuals with one or two short alleles.

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Results

The participants with two short alleles in the 5HTT transporter gene reported more depression symptoms in response to stressful life events than either of the other two groups. Participants with two long alleles reported fewer depression symptoms. Participants with one or two short alleles who had been mistreated (e.g. abused or neglected) as children had scores that could be used to predict depression in adulthood.

Conclusion

There appears to be a correlation between having short alleles on the 5HTT gene and instances of depression linked to stressful life events. Having long 5HTT gene alleles seems to offer protection from stress-related depression.

Evaluation of Caspi et al. (2003)

Strengths

- ✓ The study used a very large cohort of males and females and the age was controlled in order to isolate the variable of number of stressful life events between the ages of 21 and 26.
- ✓ It was a natural experiment, with the naturally occurring IV being the length of the alleles so it would be impossible for demand characteristics to bias this aspect of the study.

Limitations

- X Attempting to isolate the action of one gene is a highly complex and difficult undertaking: it is unknown as to how many other genes may be involved in the experience of stress and subsequent depression.
- X The symptoms of depression were self-reported which could produce biased, unreliable results due to a deliberate attempt to mislead the researchers, memory impairment, wanting to please the researchers too much.

Reference

Caspi, A., Sugden, K., Moffitt, T. E., Taylor, A., Craig, I. W., Harrington, H., ... & Poulton, R. (2003). Influence of life stress on depression: moderation by a polymorphism in the 5-HTT gene. *Science*, 301(5631), pp. 386-389.