Public Health
Significance of Neuroticism
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Presentation Outline

• Defining Neuroticism
• Neuroticism and Health
• Genes and the Environment
• Causal Links of Neuroticism
• Preventative Interventions
• Future Research
What does neuroticism look like?
Defining Neuroticism

• Freud
  • Roots in Freudian theory.
  • Modern conception mostly unrelated, defined in purely descriptive psychometric terms.

• Lahey
  • Individual differences in negative emotional response to threat, frustration, or loss.
  • Operationally defined by items referring to irritability, anger, sadness, anxiety, worry, hostility, self-consciousness, and vulnerability.
Defining Neuroticism

• Also referred to as negative emotionality or negative affectivity.
• Individuals high in neuroticism are often self-critical, sensitive to the criticism of other, and feel personally inadequate.
• Stability of neuroticism increases with age, with mean score peaking in late adolescence and decline through adulthood.
• Mean scores slightly higher in females and slightly higher in persons with lower SES.
Neuroticism and Health
Neuroticism and Mental Health

• Associations with Axis I mental disorders
  • Mood disorders, anxiety disorders, somatoform disorders schizophrenia, and eating disorders have large associations.
  • Medium associations found in substance disorders.

• Associations with Axis II personality disorders
  • Borderline, avoidant, and dependent personality disorders showed medium associations.
Neuroticism and Physical Health

• Persons with higher neuroticism scores are more likely to express unfounded medical complaints and have catastrophic thoughts about symptoms.

• Indirect evidence of physical health problems that accompany individuals with mood and anxiety disorders, such as disrupted immune functioning, abnormal cardiac functioning, and greater rates of mortality.

• Direct evidence of physical health problems such as cardiovascular disease, atopic eczema, asthma, and irritable bowel syndrome.
Comorbidity

• Because neuroticism is linked to greater risk in many mental disorders, it is also related to greater comorbidity.
• Variations in neuroticism explained 20-45% of the comorbidity among depression and anxiety disorders.
• Higher neuroticism associated with greater use of mental health services.
Predictive Utility

• From a public health perspective, more than just correlations between neuroticism and disorders is needed.
• Neuroticism scores must be able to predict occurrence of future disorders.
Predictive Utility

- Mental disorders
  - Higher neuroticism scores predictive of future episodes of major depression, schizophrenia, suicidal attempts.

- Physical disorders
  - Higher neuroticism scores predictive of greater mortality from cardiovascular disease, diabetes, cancer, and all causes of death.
Genes and the Environment
Genetic Influences

• Neuroticism is substantially heritable, with 50-60% of variance in scores attributable to genes.
• Molecular genetic studies focus on gene polymorphisms considered to be related to neural systems of emotion.
• The serotonergic system plays a major role by regulating the reuptake of serotonin in the synapse.
Genetic Influences

- 5-HTTLPR polymorphisms
  - Meta analyses show small but significant difference in neuroticism scores in persons with short 5-HTTLPR alleles.
  - Also, individuals with these same short alleles show varying amgydalic responses to threatening stimuli in fMRI images.

- Gene studies also show other polymorphisms related to the glutamate receptor function.
Environmental Influences

- Twin studies assessing the shared environment show little to no effect.
- Little is known about specific non-shared environmental effects.
  - Modest correlations between high neuroticism scores and intrusive parenting, child abuse, lack of religious upbringing, and low parental involvement.
Causal Links Between Neuroticism and Health
Overlapping Genetics

• Growing evidence that neuroticism and mental disorders are partly influenced by the same genes.

• Neuroticism completely mediates the association between the 5-HTTLPR gene and depression.
Stressful Life Events

• Persons high in neuroticism live their lives in ways that increase the likelihood of negative life events.
• Higher neuroticism is related to increased daily hassles, unstable relationships, loss of employment, and greater divorce rate.
Social Support Factors

• Neuroticism predicts lower levels of social support.

• Social support partially mediates the association between neuroticism and depression.
Emotional Reactivity

• Growing evidence to support the construct of neuroticism in which negative affect scores are higher in response to a negative mood induction task, daily diary responses on days with negative events, and the higher likelihood to develop a mood disorder following a negative life event.
Physical Health Problems

• Causal link between physical health problems could be due to the same genetic influences.
• Also, the environmental effects of experiencing more stressors and less social support.

• Higher neuroticism is associated with greater sympathetic and hypothalamic-pituitary-adrenal (HPA) reactivity and alterations of immune system responses.
Physiological Stress Reactivity

• Higher neuroticism scores related to greater cardiovascular activity, higher morning cortisol levels, disruption of circadian rhythms.

• Neuroticism could moderate the magnitude of physiological responses to stressors.
Health-Risk Behaviors

- Individuals with greater neuroticism scores more likely to smoke, become substance-dependent, and engage in unprotected sex.
Preventative Interventions
Public Health Significance

• Contingent on improving the understanding of the basic nature of all the health problems associated with neuroticism and whether this understanding can be translated into the prevention.
Methods of Intervention

• Widespread screenings of large numbers.
• Persons with high scores of neuroticism could be provided interventions tailored to their needs.

• Potential benefit of early detection of at-risk individuals, however must be balanced against the number of false positives.
Methods of Intervention

• More expensive interventions would need to produce larger decreases in the disorder in order to be cost-effective.
• Must consider possible negative-iatrogenic effects and possibility of reducing adaptive levels of fearfulness and wariness.
Future Research

• Further testing and development of causal models; develop truly integrated models.
• Better understand genetic and environmental factors.
• Further identify and develop methods of intervention and their effect on widespread use in the population.