Biological Traits

Chapter 12
Hans Eysenck

- 1916-1997
- Born Berlin, German
- Son of two actors, divorced when he was 2
- Left Germany for England at start of anti-Semitism and Nazi Era
- PhD from University of London (1940)
  - “What on Earth is Psychology?”
Historical Predecessors: The Four Temperaments

- Hippocrates (460? - 377? B.C.)
- Galen (130? - 200?) elaboration
- Personality could be characterized by body fluids or humors
  - Sanguine (Blood) sturdiness, cheerfulness
  - Phlegmatic (Mucus) slow, solid, apathetic
  - Melancholic (Black Bile) depression
  - Choleric (Yellow Bile) irascible, violent
- NOT traits → typology
  - Distinct, discrete, separate categories to which an individual is assigned
The Four Temperaments: Wundt

- Further elaboration by Wilhelm Wundt who applied continuous variables to typology
Eysenck’s Approach

- Humans as biosocial animals
- Psychology, then, is the place that biological and social sciences converge
- Considered scientific methods to be essential at a time when Psychology was a very “soft” science (think: philosophy)
  - Factor analytic approaches
  - Correlational methodology
  - Experimental methodology
Eysenck’s Approach

Eysenck applied the following methodology to his study of personality and human behavior:

- Hypothesize relationship between personality traits
- Conduct FA studies to identify clusters of traits
- Construct biological theory to account for behaviors associated with underlying factors
- Generate hypotheses from theory concerning specific testable components.
- Conduct experiments to validate theory
- Revise theory informed by findings (deviation OK)
Thesis Problem Focus
Reduces Depression

Hypothesis 1
Problem Solving
Supported
Theory may be Target

Hypothesis 2
Emotional Release
Partially Supported
Revise Theory

Revised Theory

Integrate and Verify

Emotional Avoidance?
Identification of Super Factors

- **Personality** is a “more or less stable and enduring organization of a person’s character, temperament, intellect, and physique which determines his unique adjustment to the environment”

- Hierarchical organization and structure
Eysenck’s Hierarchical Model

**Specific Responses**
Behaviors we can actually observe

**Habitual Responses**
Clusters of specific behaviors that recur in similar circumstances
- Buying groceries, giving parties

**Traits**
Clusters of habitual responses similar to Cattell’s Source Traits

**Types (Superfactors)**
Broad general dimensions → goal of personality research
Identification of Super Factors

Type Level

Trait Level

Habitual Response

Specific Response

Extraversion

Sociability

Liveliness

Activity
Three Main Superfactors

- Eysenck reviewed work on temperament literature and noticed recurring themes
  
  **Extraversion vs. Introversion**
  - Degree to which a person is outgoing and participative in relating to others

  **Neuroticism vs. Emotional Stability**
  - An individual’s adjustment to environment and stability of behavior over time

  **Psychoticism**
  - The loss of distortion of reality and the inability to distinguish between reality and fantasy
  - Not a dimension like the other two—present in all individuals to some degree
Intercorrelation of traits:
Factor Analytic Results

- Neuroticism
  - Moody
  - Touchy
- Extraversion
  - Active
  - Extraverted
  - Sociable
- Introversion
  - Melancholic
  - Phlegmatic
  - Sanguine
  - Coleric

- Emotional Stability
  - Calm
  - Carefree
  - Lively
  - Relaxed
  - Responsive

- Touchy
  - Restless
  - Aggressive
  - Excitable
- Resilient
  - Sober
  - Pessimistic
- Changeable
  - Impulsive
  - Flexible
- Restful
  - Reserved
  - Reserved
  - Reserved
  - Reserved
- Active
  - Controlled
  - Reliable
  - Easygoing
- Carefree
  - Thoughtful
  - Peaceful
  - Spontaneous
- Calm
  - Carefree
  - Lively
  - Easygoing
  - Sociable
PSYCHOTICISM

- Aggressive
- Antisocial
- Cold
- Creative
- Egocentric
- Impersonal
- Impulsive
- Tough-Minded
- Unempathic
One Additional Superfactor

Intelligence

- **Biological Intelligence** the physiological, neurological and anatomical bases
- **Psychometric Intelligence** the numerical measure designed to reflect intelligence → IQ, Spearman’s (g)
  - Biological, but socially influenced
- **Practical Intelligence** common sense
- Interface of personality superfactors and intelligence
  - Personality influences Psychometric Intelligence, but intelligence has a limited impact on personality
Superfactor Caveats

- Emotional stability, neuroticism, and psychoticism denote a *tendency* to behave in a certain way
  - NOT a psychiatric diagnosis
  - A disorder might occur if these tendencies were combined with *genetic/environmental* factors
- Believed that differences in superfactors mainly genetic
Eysenck vs. Cattell

- Significant differences between Eysenck and Cattell and Eysenck and Big Five
  - Traits vs. Supertraits

- Scope of theory
  - Cattell – very broad personality dimensions
  - Eysenck – few, narrowly focused superfactors
    - Representative of “second-order” factors in Cattell’s Model \( \Rightarrow \) OCEAN

- Eysenck thought Cattell relied too much on factor analysis
  - At some point, factor analysis is arbitrary (axes)
  - Cattell oblique (correlated) factors
  - Eysenck orthogonal (uncorrelated) factors
Measurement of Traits

- Accurate measurement important to developing descriptive and causal theory
  - Self-report inventories
  - Observation of participant’s behavior in controlled or naturalistic environment
    - Children
- **Criterion analysis** is Eysenck’s way of testing the accuracy of measures
  - Have a hypothesis about your new measure
  - Compare groups using a gold standard
    - Single assessment measure given to an emotionally stable group vs. a neurotic group
The anatomical structures that Eysenck hypothesizes may be responsible for inherited differences in introversion-extraversion and emotional stability-neuroticism.
Causal Agents of Behavior

- Patterns of behavior associated with particular brain activation patterns
- **Introversion-Extraversion** associated with ascending reticular activating system
  - RAS associated with arousal/sleep
  - Introverts have over excitation of RAS
  - Over activation $\rightarrow$ restraint of behavior
  - Under activation $\rightarrow$ absence of constraint
  - Some evidence in EEG/ECG studies
Causal Agents of Behavior (cont.)

- **Emotional Stability**-Neuroticism associated with **visceral brain activation**
  - VB includes limbic system and hypothalamus
  - VB associated with motivation and emotion
  - Low threshold for VB activation (easily aroused) are more emotional and this more neurotic

- **Psychoticism** thought to be associated with hormonal imbalance (androgen) and neurotransmitter levels
# Visceral Brain Activation

<table>
<thead>
<tr>
<th>Neurotic Introvert (anxiety types)</th>
<th>Neurotic Extravert (psychopathic type)</th>
<th>Emotionally stable Introvert</th>
<th>Emotionally stable Extravert</th>
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<tbody>
<tr>
<td>High</td>
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- Neurotic Introvert (anxiety types)
- Neurotic Extravert (psychopathic type)
On Neurotic Introverts (1947)

The neurotic introverts show a tendency to develop anxiety and depression symptoms ... they are characterized by obsessional tendencies, irritability, apathy ... and they suffer from lability of the autonomic system. According to their own statement, their feelings are easily hurt, they are self-conscious, nervous, given to feelings of inferiority, moody, day-dream easily, keep in the background on social occasions, and suffer from sleeplessness. In their body-build, vertical growth predominates over horizontal growth; their effort response is poor, and their choline esterase activity is high. Salivary secretion is inhibited. Their intelligence is comparatively high, their vocabulary excellent, and they tend to be persistent. They are generally accurate, but slow; they excel at finicking work. Their level of aspiration is unduly high, but they tend to under-rate their performance. Withal, they are rigid, and show little interpersonal variability. Their aesthetic preferences are towards the quiet, old-fashioned type of picture. They do not appreciate jokes very much, and sex jokes in particular are not favoured.
On Neurotic Extraverts (1947)

The neurotic extraverts show a tendency to develop hysterical conversion symptoms, and an hysterical attitude to their symptoms. Furthermore, they show little energy, narrow interests, have a bad work-history, and are hypocondriachal. According to their own statement, they are troubled by stammer or stutter, are accident prone, frequently off work through illness, disgruntled, and troubled by aches and pains. In their body-build, horizontal growth predominates over vertical growth; their effort response is quite good, and their choline esterase activity low. Salivary secretion is not inhibited. Their intelligence is comparatively low, their vocabulary poor, and they tend to show extreme lack of persistence. They tend to be quick but inaccurate; they are bad at finicking work. Their level of aspiration is low, but they tend to over-rate their performance. They are not very rigid, and show great interpersonal variability. Their aesthetic preferences are towards colourful modern type of picture. They appreciate jokes and are particularly fond of sex jokes.
Psychotherapy

- Eysenck maintained that much of behavior is determined by genetic factors.
- Limited evidence of psychotherapy’s efficacy (1952)
  - Spontaneous remission just as likely as cure in psychotherapy
  - Smith and Glass, then Seligman, counter (1990s)
- Proponent of behavior therapy (Classical Conditioning)
  - Experimental evidence, no longer emulating the methodology of classical psychoanalysis
Psychotherapy

- Treatment matching
  - Extraverts to group therapy
  - Introverts to individual therapy
  - Some personalities may respond better to medication than do others (biological factors)
Attack on the Medical Model
(1976)

In distinct contrast to the medical model, we have the behavioural model, which forms the basis of behaviour therapy. This model postulates very simply that all behaviour is learned, and that ‘abnormal’ behaviour is learned according to the same laws as ‘normal’ behaviour. The principles of learning and condition apply equally to both, enabling us to understand the genesis of both normal and abnormal behaviour. Thus, the ‘symptoms’ the patient complains of are simply items of behaviour which the patient has learned; there is no underlying ‘cause’ or ‘complex’ which produces and sustains the ‘symptoms,’ and makes them reappear once they have been eliminated by ‘purely symptomatic’ treatment. It also follows from this way of looking at the problem that behaviours, once learned, can also be unlearned, or ‘extinguished’ as the Pavlovian would say.