

# Sociobiology: Part Two

## Recent Results for Humans

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Kathryn Paige Harden, The Genetic Lottery: Why DNA Matters for Social Equality; Princeton University Press, 2021

- Single Nucleotide Polymorphisms (SNP); single genetic mutation
- Polygenic Index; position, number, and weight (importance) of individual's mutations
- Genome-wide Association Study (GWAS); correlation of genetic attribute with social or overall organism attribute (behavior)

Human Attributes: height, weight, body type, hair color, eye color. ...

Human gene mutations associated with diseases: Sickle-cell, Tay-Sachs, Huntington's, cancer, diabetes, heart, asthma, ...

Wealth (home, physical and monetary assets – debts) vs. Individual genetic variants associated with educational attainment (not years in school):

- a) 1-2 adults, age 65-75, white, different genders, retired.
- b) people in first quartile of polygenic index had \$475,000 less wealth than people in 4<sup>th</sup> (top) quartile.
- c) people 1 std. dev. higher on polygenic index scale had 25% more wealth.
- d) when comparing people with same # years of schooling, a 1 std. dev. higher polygenic index score is associated with an 8% wealth increase.
- e) in parallel sibling study, sibling with higher polygenic index score was wealthier at retirement.

Educational Attainment: speed of educational advancement, amount of schooling completed, etc.

a) GWAS plus synaptic neurotransmission and neuron ion channel activity studies were used.

b) genes are expressed prenatally.

c) cognitive effects appear at different ages: polygenic index scores correlate with talking at age 3 and IQ scores at age 5.

d) “executive functions” (regulation of attention, ability to stop self, ability to shift from one rule to another, update information in real time, keep small amounts of information in working memory) are 100% heritable; this is often manifested by ability to do better on tests which obviously leads to more easily attained advanced schooling.

e) GWAS scores correlate with “non-cognitive skills” such as openness to novel experiences, curiosity, learning eagerness, deferment of gratification, etc. All lead to educational attainment.

f) however GWAS scores also correlate with schizophrenia, bipolar disorders, anorexia, obsessive-compulsive disorders, etc.!

Genetics is Not Destiny!

However, Genetics Should Not be Ignored!