Where Does Intelligence Come From?

Genetically related
Environmentally related
Both

P-O: parent-offspring
Sib: siblings
DZ: dizygotic twins
MZ: monozygotic twins

<table>
<thead>
<tr>
<th>Relationship</th>
<th>Raised together</th>
<th>Raised apart</th>
<th>Adoptive</th>
<th>Raised together</th>
<th>Raised apart</th>
</tr>
</thead>
<tbody>
<tr>
<td>Genetic relatedness</td>
<td>P-O</td>
<td>Sib</td>
<td>P-O</td>
<td>Sib</td>
<td>P-O</td>
</tr>
<tr>
<td>Same home?</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
</tr>
</tbody>
</table>

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Where Does Intelligence Come From?

Table 10.3 (reformatted): Intelligence Test Correlations Between People with Different Relationships

<table>
<thead>
<tr>
<th>Genetic overlap</th>
<th>Relationship</th>
<th>Reared or lived apart</th>
<th>Reared or lived together</th>
</tr>
</thead>
<tbody>
<tr>
<td>0%</td>
<td>Adopted children</td>
<td>.00</td>
<td>.02</td>
</tr>
<tr>
<td>0%</td>
<td>Adoptive parent and child</td>
<td>.00</td>
<td>.19</td>
</tr>
<tr>
<td>0%</td>
<td>Adopted siblings</td>
<td>.00</td>
<td>.32</td>
</tr>
<tr>
<td>25%</td>
<td>Cousins</td>
<td>.25</td>
<td>.25</td>
</tr>
<tr>
<td>50%</td>
<td>Biological parent and child</td>
<td>.24</td>
<td>.42</td>
</tr>
<tr>
<td>50%</td>
<td>Siblings</td>
<td>.24</td>
<td>.47</td>
</tr>
<tr>
<td>50%</td>
<td>Fraternal twins</td>
<td></td>
<td>.60</td>
</tr>
<tr>
<td>100%</td>
<td>Identical twins</td>
<td>.78</td>
<td>.86</td>
</tr>
</tbody>
</table>

Evidence for the Influence of Genetics on Intelligence

- As genetic overlap increases (reading from the top of the table to the bottom of the table), the correlation (similarity) of intelligence increases between siblings/parents increase.

Evidence for the Influence of the Environment on Intelligence

- As the environmental similarity increases (reading left to right of the table), so does the correlation of intelligence between siblings/parents increase.

Both genetic and environmental factors influence intelligence.
Environmental factors influencing intelligence

Average IQ scores, like height and weight, have steadily increased over the last century. As a group, Black Americans once scored about 15 points lower than white Americans; however, this gap has narrowed over the past few decades to 10 points or less. Environmental changes occur much more drastically than the genetic variations in one or two generations.

**Economics:**
- Being raised in a high-SES (socio-economic status) family rather than a low SES family is worth between 12 to 18 points of IQ (page 347).
- Siblings adopted by a upper-middle SES family had an average IQ of 109, while the sibling raised by a low SES family had an average IQ of 95.
- Black children raised by white families who are highly educated and above average in occupational status and income (families with a high SES) had IQ scores higher than the average scores of other black and white children.

It is believed that a higher SES have better nutrition, better medical care, experience lower stress levels, and less likely to be exposed to environmental toxins such as air pollution and lead (page 347). All of these can influence brain development. In addition those in a higher SES are more likely to be breast fed, which is associated with a higher IQ and provide a more cognitively stimulating environment and interact with their children.
Education:
- When schooling is delayed by war, political strife, or lack of qualified teachers, children show a measurable decline in IQ (page 412).
- African American children who were exposed to an intensive early-education program that began when they were 6 months old and lasted until they entered kindergarten showed higher IQ scores when compared to a control group of similar children.

Culture:
- In early childhood there is no difference in IQ between Chinese, Japanese and American children. However, Chinese and Japanese middle school children tend to score above white Americans on both math and reading. These differences appear to be due to different educational systems.
- The average IQ is lower for members of a discriminated-against minority group—even when the group is not racially different from the dominant group. The Buraku, the poorest people in Japan have lower IQs than the Japanese. However, when they are treated like "Japanese" in America, they score just as well as any other Japanese-Americans.
- It is argued that poor treatment of minority groups can make them pessimistic about their chances of success within their cultures, potentially making them less likely to believe that hard work will pay off for them (page 349).
Stereotype Threat

Standardized tests attempt to make the conditions in which people take the test as uniform as possible. However, it is impossible to standardize all conditions including expectations that we might have with regards to groups of people and their performances.

Stereotype Threat: A psychological predicament in which the fear that you will be evaluated in terms of a negative stereotype about a group to which you belong creates anxiety and self-doubt. This anxiety and self-doubt lowers performance in a particular domain that is important to you.

For example:
- Women and math
- Minorities and academic performance
- Blonds and intelligence

These negative stereotypes that exist within a society can evoke anxiety and undermines performance on assessments of academic performance (page 320).
Stereotype Threat

Men and Women who were good at math were selected. Both were equally capable.

They were randomly assigned to the expectations about the exam (IV)

Their math performance was assessed (DV)

Results:
African Americans and White Americans were selected. Both were equally capable.

They were randomly assigned to the expectations about the exam (IV)

Their verbal ability was assessed (DV)
**Stereotype Threat**

Stereotype threat has been demonstrated from a range of stereotyped groups (e.g. blacks, Latinos, Turkish Germans, women).

The stereotyped groups performed worse than the non-stereotyped groups in evaluative conditions, but not when an exam is presented as non-evaluative.

Informing people about the negative consequences of stereotype threat can reduce its effect.

Focusing on your positive characteristics of your lives does also reduce the effects of the negative stereotypes of your group. Other studies have found that bolstering peer relationships reduces the stereotype threat (page 351).
Why should you care?
Does a high IQ predict success in life? (In Focus 7.3)

The following are common beliefs people have about people with a high IQ:

(1) People believe a high IQ predicts success in life.
(2) People believe a high IQ is positively correlated to
   • social and personal maladjustment,
   • physical weakness, and
   • mental instability.
   This means that as IQ goes up, so does social and personal maladjustment, physical weakness and mental instability. Likewise, as IQ goes down, so does social and personal maladjustment, physical weakness and mental instability.

If we have these beliefs, how would we casually test these beliefs to reinforce them?

Lewis Terman assessed these beliefs about people with high IQs in 1926.
   • What did Lewis Terman find?
   • How did he investigate this question?

To find out, read In-Focus 7.3, page 299.
Terman identified children with an IQ above 140 and tracked their progress as an adult.

From the group of people who had an IQ greater than 140, he found the following:

- They were socially well-adjusted.
- They were taller, stronger, healthier than average children, with fewer accidents and illnesses.
- They performed exceptionally well in school.
- The average income in 1955 of these adults was $33,000, while the average income in 1955 was $5,000.
- Two-thirds of these adults had college degrees with many advance degrees.
- There were no creative geniuses such as Picasso, Mozart or Einstein.
- Many were employed as doctors, lawyers, scientists, university professors, business executives and other professional occupations.
However, when he compared the top 100 most successful men and the 100 least successful men, each with an IQ greater than 140, there were large differences.

- Only a handful of the 100 least successful men with high IQs were professionals, and none were doing exceptionally well.
- The 100 least successful men with high IQs were earning slightly above the national average, whereas the 100 most successful men with high IQs were earning five times the national average.
- The 100 least successful men with high IQs were less healthy, had higher rates of alcoholism and were three times as likely to be divorced.

What accounted for the difference?

- Terman found that the 100 most successful men with high IQs were much more likely to display "prudence and forethought, will power, perseverance and the desire to excel as children."
- As adults, the 100 most successful men with high IQs were rated higher on three traits: goal-orientation, perseverance and self-confidence. In addition, many different personality factors are involved in achieving success, such as motivation, emotional maturity, commitment to goals, creativity, and—perhaps most important—a willingness to work hard. None of these are assessed by traditional IQ tests.
What does this suggest about success and intelligence?

- Intelligence helps, but individual characteristics are important too, such as motivation, emotional maturity, commitment to goals, creativity and the willingness to work hard, which are not measured by traditional IQ tests facilitate success.
- IQ predicts academic success, but not success beyond school (other factors affect your work performance, such as creativity, problem solving, working well with others, etc.)

What does Terman’s study have to say about the following beliefs?

(1) People believe a high IQ predicts success in life.  
**Partial truth:** High IQ does predict success in life, but it isn’t the only factor. Individual differences such as goal-orientation, perseverance and self-confidence played a major role in success.

(2) People believe a high IQ is positively correlated to social and personal maladjustment, physical weakness, and mental instability. This means that as IQ goes up, so does social and personal maladjustment, physical weakness and mental instability. Likewise, as IQ goes down, so does social and personal maladjustment, physical weakness and mental instability.
Not true: On the average, people with a high IQ are socially well adjusted, physically strong and mentally stable.

Why is important to know whether these beliefs are likely to be true or false?
Closure

What are the main points from today?

Why should you care?