

BIOLOGICAL MODEL

Is Personality Genetically Determined?

$$V_t = V_g + V_e + V_m$$

V_t = Total observed variance of a trait

V_g = Variance due to genetic differences among people

V_e = Variance due to environmental or experiential factor

V_m = Variance due to measurement error and unsystematic temporal fluctuations.

Nature over Nurture

Typology

**Sir Francis Galton
(1822-1911)
“co-relation”
Eugenics**

**David C. Rowe
(University of Arizona)**

Classical Twin Design

Two kinds of reared-together twins (**Identical Twins--(Monozygotic Twins [MT] and Fraternal Twins--Dizygotic Twins [DT])**) are compared

It is true that an adoptive parent resembles only one kind of child in his or her family, the biological child [in contrasted to the adopted child]. The MMPI traits could not be predicted from the adoptive parents'. Yet the MMPI traits could be predicted from their birth mothers' MMPI traits ($r = .18, n = 135 [p < .05]$). Thus we fully recover the fully expected of family resemblance once we have information on a biological parent—even a biological parent whose contact with her child was limited to a few hours or days after birth. The observations lead strongly to the inference that what creates parent-child resemblance in natural families is biology, and that no process of imitation, modeling, or emotional identification is required to induce it.

Rowe, 1994, p 70

r is a correlation coefficient a number between 1.0 and -1.0 which is a measure of how two variables covary. In other words to what degree does the variance of one variable relate to another variable.

Coefficient of Nondetermination
Coefficient of the Residuals
 $1 - r^2_{xy}$

Rowe: Individuals who share genes are alike in personality regardless of how they are reared, whereas rearing environments induce little or no personality resemblance. Rice, 1994

Extraversion and Degree of Genetic Relationship

TABLE 3.1. Averaged Extraversion Correlations in Two Twin-Family Studies

	Mean <i>r</i>	No. of pairs	<i>r_g^a</i>	Social relation
MZ twins	.43	116	1.00	Twins
Siblings in twin families	.23	177	.50	Full siblings
Twin parent to own child	.22	413	.50	Parent-child
Twin parent to brother's or sister's child	.21	192	.50	Uncle/aunt-nephew/niece
Cousins via MZ twins	.16	138	.25	Cousins

Note. Correlations reflect weighted average of two twin-family studies. Original sources: Price, Vandenberg, Iyer, & Williams (1982) and Loehlin (1986). Adapted from Loehlin & Rowe (1992). Copyright 1992 by Harvester Wheatsheaf. Adapted by permission.
^a*r_g* is the relatives' genetic correlation.

**Other possible variables to account for
the variances between the two sets of MZ twins?**

Test reliability

Test validity

Situational factors

Environmental variables

Including prenatal events

Individual reasoning

*(The abstracting mind brings the past
effectively into the present, and its power
of anticipation brings the future into the present
as well. (Millon, 1990, p 43))*

Minnesota Twin studies

California Personality Inventory