

Twin Study Design

The twin study method takes advantage of a naturally occurring phenomenon: the two types of human twins. Some twins are monozygotic (MZ); that is, the two babies come from the same fertilized egg. These are the twins that look alike physically, the ones we commonly call identical twins. The important point for researchers is that MZ twins have identical genes. The other type, dizygotic (DZ) twins, come from different eggs. These two babies, commonly called fraternal twins, are no more alike genetically than any two siblings.

The logic behind the twin-study method is illustrated in the Figure at the right.

We assume that two same-sex DZ twins and two MZ twins (who are always the same sex) share very similar environments. In other words, we assume that the environment acts to make MZ twins similar. But we assume that the environment acts to make DZ twins similar as well. In fact we assume that the environment doesn't make MZ twins any more similar than it makes DZ twins similar (hence the concept of "equally similar"). The extent to which the environment is responsible for their behavior (in the case below: personalities) is going to be about the same for both types of twin pairs. However, if there is also a genetic influence on personality, we would expect the MZ twins to be more like each other than are the DZ twins. This is because the MZ twins also have identical genes, but the DZ twins do not.

Put another way: we have 2 groups (MZ and DZ). Do they differ in terms of influence from environment =- NO. Do they differ in terms of influence from genes = YES. So if we find MZs are more similar to each other than DZs are similar to each other, then it must be due to the influence of genes.

Researchers using the twin-study method give personality trait measures to both members of both kinds of twins. They then look at how similar the twin brothers and sisters are on the traits. If trait scores for the MZ twin pairs are more highly correlated than the scores for the DZ twin pairs, they have evidence for genetic influence on personality. Because the environmental influence is roughly the same for both kinds of twins, it is assumed that the MZ twins are more alike because they also have identical genes.

Twin-study research usually generates correlation tables similar to the one found in Table 10.1. In this example, adult MZ and DZ twin pairs were compared on the Big Five personality traits. As seen in the table, the MZ twin pairs were more similar than the DZ twin pairs in each case (Riemann, Angleitner, & Strelau, 1997). This is interpreted to mean that genes matter in determining our personality.

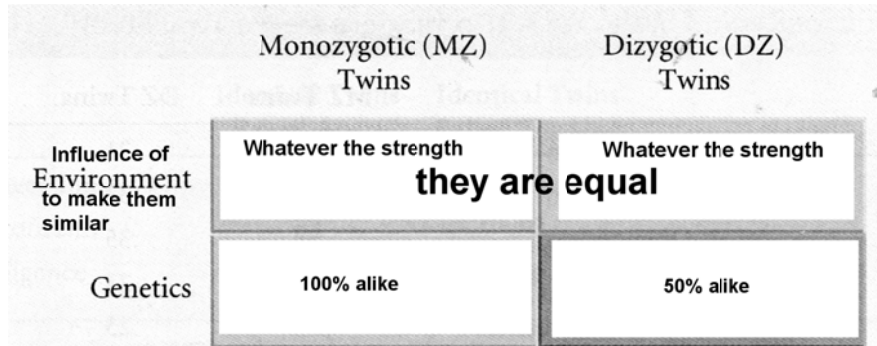


Table 10.1 Correlations from a Twin Study

	MZ Twins	DZ Twins
Neuroticism	.53	.21
Extraversion	.56	.33
Openness	.54	.35
Agreeableness	.42	.24
Conscientiousness	.54	.23

Source: Riemann, Angleitner, and Strelau (1997).