

“The History of Twins, As a Criterion of the Relative Powers of Nature and Nurture” (1875), by Francis Galton

In the article “The History of Twins, As a Criterion of the Relative Powers of Nature and Nurture,” Francis Galton describes his study of twins. Published in 1875 in Fraser’s Magazine in London, England, the article lays out Galton’s use of twins to examine and distinguish between the characteristics people have at birth and the characteristics they receive from the circumstances of life and experience. Galton calls those factors nature and nurture. Based on his study, Galton concluded that nature has a larger effect than nurture on development. By studying twins, Galton introduced a way to examine the effects of nature and nurture in people who were born with similar traits, which allowed him to focus on the effects of experience on a person’s development.

Galton worked in England and studied many subjects, including geography, literature, heredity, and statistics. He also contributed many publications and inventions to science. In 1859, Galton’s half cousin Charles Darwin published *On the Origin of Species*, a book in which Darwin introduced the theory of evolution or the change in the heritable characteristics of biological populations over successive generations, natural selection or survival of better adapted individuals, and heredity or the passing of genetic information from parents to offspring. While genes were not completely understood at the time, researchers were trying to determine if certain traits such as intelligence or strength were present at birth, or what is also referred to as available through nature, or if those traits were obtained through experience and the environment that a person develops in after birth, which is also referred to as the effects of nurture. Galton’s studies about the effects of nature and nurture followed from theories presented in Darwin’s book. To study the effects of nature and nurture on an individual’s disposition and intellectual ability, Galton studied twins, who had similar or identical traits.

As many pieces of literature at that time, Galton’s article on twins is not separated into different sections. Galton starts his article by describing why he chose to conduct his examination of the effects of nature and nurture through the study of twins. Galton presents his own definition of twins. He then moves on to describe how he was able to collect data about twins through his studies. Galton then talks about the data he collected. Galton uses the descriptions in inquiries he collected to compare and contrast different physical and mental characteristics of twins, and he finally states the conclusion of his study.

Galton starts his article by stating the difficulty of determining the effects of nature and nurture on an individual’s intellectual ability and success in life when studying unrelated people. He notes that no matter how plausible it may seem that an individual inherited traits of intellectual aptitude from their parents, the success of an individual can always be attributed to the education and experience that individual received throughout her life. Galton continues to explain that twins should inherit similar traits from their parents, and twin studies would reveal whether nature or nurture has a bigger effect. To gain direct evidence about the effects of nature and nurture, Galton states that he examined twins who were similar during childhood and who were educated together and then determine if they became dissimilar as they grew. He states that he could ask the family their opinions on what caused the eventual dissimilarity. Galton also explains that he examined twins who were very dissimilar during their youth and determined if they become more alike as they grew.

To clarify the terms in his article, Galton provides two distinct definitions for the occurrence of twins.

Galton first defines twins as being more than one offspring who are born at the same time. He gives examples of animals that normally give birth to multiple offspring. He defines a second subset of twins as more than one offspring born from double-yolked eggs that occur due to two germinal spots in the same ovum. In the article, Galton classifies twins into three groups, either strongly alike, moderately alike, or extremely dissimilar. He finally explains that from his observations, if the twins are of different gender, then they are never closely alike and did not originate from a single double-yolked egg. Galton does not specify the criteria he used to classify the three groups.

After defining his terms, Galton describes his study. In his paper, Galton states that he sent out surveys to twins or people who were related to twins. The surveys contained questions organized in thirteen groups. The last group of questions asked for the addresses of other twins who might be likely to respond to the surveys, which allowed Galton to obtain a large number of reported cases. Galton states he received responses from eighty sets of twins, and he focuses on thirty-five of those cases in his article, because those responses were the most detailed.

Galton continues to explain the data he received. Galton mentions that from the responses he received, only a few mentioned twins that were completely similar and indistinguishable. According to Galton, most of the responses he received detailed twins that had nearly identical hair and eye color, and were similar in weight, height, strength, and vocal intonation. He states that respondents reported many differences in handwriting. Galton describes interactions between the twins and their families and friends, and how the identities of the twins could be easily confused by other people. He also mentions that with all the similarities, there always seemed to be a difference of expression that helped identify the twins from each other. He also notes that mothers are more likely to be able to distinguish between twins and that the similarities are more common during youth but that twins become easier to distinguish as they mature into adulthood.

Galton provides anecdotes about several cases he received in which twins succeeded in intentionally misleading people about their identity. Galton also describes cases in which parents were not able to distinguish between their descendants, or children who could not distinguish between their twin mother and aunt, emphasizing the fact that twins remained similar even after maturity. Other descriptions include cases in which twins suffer from similar ailments at similar times even when they live in different areas. Galton also states that there is often similarity in twins' ideas, remarks, and decisions.

Galton states that of the thirty-five cases about which he received detailed responses, sixteen cases were described as closely similar and nineteen were described as much alike but subject to certain differences. He states that the differences provided often related to personality traits such as energetic, gentle, timid, fearless, calm, independent, among others.

Finally, Galton mentions that twins that are similar during childhood rarely become dissimilar during maturity, even when they are raised in different environments. Moreover, Galton mentions that from twenty cases he looked at, twins that were born with different genders or were dissimilar at birth never became similar even when they were raised in similar environments. Galton uses those two observations to reach the conclusion of his study and concludes that nature has a larger effect than nurture on development.

After Galton's study, scientists around the world began using twins in the study of heredity. In 1905, Edward Thorndike, a psychologist in the US, conducted physiological tests on fifty sets of twins and concluded that the similarity of twins were innate rather than acquired. In the mid-1900s, Hermann Werner Siemens, a dermatologist in Europe, introduced the widely used twin method in scientific studies. He used twin studies to determine the role of genes in skin diseases and distinguished between identical and non-identical twins. Those studies became the basis of understanding the development of twins and provided insight about heredity.

Galton's article is highly cited, and his studies inspired multiple twin studies that followed from his work. According to the writers, Horatio Newman, Frank Freeman, and Karl Holzinger in a book that discusses various twin studies, Galton was the first investigator to relate the likeness of twins to evidence of inheritance.

Galton's study of twins was the first to incorporate twins to determine the relationship between na-

ture and nurture. Because heredity was a popular topic in the mid to late 1900s, many researchers tried to understand what caused people to have different characteristics, such as height or intelligence. Galton's article established a way for scientists to study how environmental effects can influence heredity.

Sources

1. Darwin, Charles. *On the Origin of Species*. London: Ward, Lock, and Co, 1911. <https://archive.org/details/in.ernet.dli.2015.93440> (Accessed September 1, 2017).
2. Galton, Francis. "The History of Twins, As a Criterion of the Relative Powers of Nature and Nurture." *Fraser's Magazine* 12 (1875): 566-76. <http://galton.org/essays/1870-1879/galton-1875-history-twins.pdf> (Accessed September 1, 2017).
3. Newman Horatio, Freeman Frank, and Holzinger Karl. *Twins, a Study of Heredity and Environment*. Chicago: The University of Chicago Press, 1937. <https://archive.org/details/twinsa-studyofher031983mbp> (Accessed May, 3 2017).
4. Siemens, Hermann Werner. "Die Zwillingspathologie: Ihre Bedeutung, ihre Methodik, ihre bisherigen Ergebnisse (Twin Pathology: Its Importance, Its Methodology, Its Previous Results)" Berlin: Verlag von Julius Springer (1924).
5. Thorndike, Edward. "Measurement of Twins." *The Journal of Philosophy, Psychology and Scientific Methods*. 2 (1905): 547-553. https://www.jstor.org/stable/2011451?seq=6#page_scan_tab_contents (Accessed September 1, 2017).