Claim 1

Genetic factors play such a strong role in human development that genes alone can determine certain human behavioral characteristics.

Susan likes coffee a lot and often has some when out with friends. But she’d rather have it at home because there it’s easier to fix it the way she wants. Susan likes to put the cream in the cup and then add the coffee to it rather than the other way around. “That’s weird,” say her friends. “How come you do it like that?” “I don’t know,” replies Susan. “My dad does the same thing, and so does Grandma. I guess it must be genetic. People say I smile just like the two of them, too. But, you know, my adopted sister fixes her coffee the way I do.”

*Could Susan’s coffee habits be genetic in origin?*

The connection between genetic factors and behavior is sometimes obvious in animals. For example, some dog breeds tend to be very calm and friendly, and others are quite aggressive. Some cattle are much less aggressive than others, which is important because no matter how much milk a cow can give, if you can’t get close to her, you won’t get milk. Other animal behaviors may be affected by both genetic factors and experience—for instance, some dogs have the potential to become excellent retrievers,
but unless they have a chance to be trained in this skill, they will not master the retrieving task.

Some human characteristics are strongly determined by genetic factors, and a specific genetic difference may govern many aspects of development (Kaplan, Wang, & Francke, 2001). On the other hand, some developmental changes appear not to be genetically governed but instead are influenced by experience only (Roisman & Fraley, 2006).

It is often quite difficult to figure out the connection between human genetics and behavior. Human beings select their own mates; they are not deliberately bred for certain behaviors as dogs may be. The belief that genes are directly responsible for a person’s habits and actions is probably based on dramatic claims derived from some studies of twins. Popular reports about twins who were separated at birth and later reunited contain startling similarities. Some twin pairs who were raised apart from each other are reported to have given their dogs the same name and to have displayed identical idiosyncratic behaviors, such as flushing a toilet both before and after using it.

Can such reports provide strong evidence about the connection between genes and specific behaviors? A number of problems arise when making too much of this kind of evidence. One problem has to do with possible differences between volunteers and people who are reluctant to participate in research. Studies of reunited twins depend on twins to respond to advertised studies or to seek out ongoing research programs. In these cases, the reports may represent only the twin pairs who discover, to their surprise, that they resemble each other greatly, rather than those who discover that they are not at all alike. And of course twin pairs who were not reunited—or twins who never even knew they had a twin sibling—would not be included in this study. It’s possible that twins who resemble each other are more likely to go to the same places, do the same things, and discover each other than are twins who are quite different.

Another issue has to do with the small number of separated and reunited twins compared with the large numbers of nontwin siblings or twins who were never separated. Twinning is unusual in humans, and situations where the babies would be separated are even less likely. Counterintuitive though it may be, small rather than large samples are more likely to provide extreme results because extreme measures have more of a chance to average out when large samples are used. The effect of extreme results in small groups is exaggerated when the news media report on only a small group of cases where there is a surprising resemblance between twins and not on others where there are small and undramatic resemblances.

Studies of reunited twins may show genetic effects on intelligence or health but are not very good evidence that specific behaviors can be “in
the DNA." However, other sources of information support the idea that genetic factors are powerful. People with an unusual genetic makeup sometimes display uncommon behaviors, such as hand-wringing. Babies of different ethnic backgrounds may show different behaviors shortly after birth, when it seems there has been too short a time for differences to be learned.

More often, though, it appears that an individual’s phenotype, or developed physical and behavioral characteristics, is determined by genetic factors and environment working together in complicated ways (Plomin, 2000). For example, children share their parents’ genetic material, but the children’s development is also shaped by experiences their parents choose for them, such as music lessons, low-fat meals, or severe physical punishment. The parents’ choices for their children may be the result of the parents’ own genetic makeup, their childhood experiences (either repeating them or rejecting them), or a combination of the two as well as many other factors. To some degree, parents’ genetic makeup plays a role in their children’s experiences as well as in their children’s genetic characteristics.

Genetically determined characteristics of a child’s appearance or behavior can also cause others to treat the child in predictable ways. A small, thin child may be treated with more care than a large, robust child who is rarely sick and does not seem to mind minor pains and injuries. The experiences of both the thin and the robust child are not random events but are indirectly related to each child’s genetic makeup so that the long-term effect of the genetic material is potentially much greater than the individual’s physical characteristics alone.

As children become older, they are increasingly free to choose their own experiences and thus to shape their own development. Some of their choices may be determined by past experiences and some by genetic components. But certainly some choices in later childhood and adolescence come about because of genetic material as well as body type, activity preferences, or emotional tendencies that result from the biological inheritance.

Directly or indirectly, genetic factors can have a powerful effect on behavior, and in recent years developmental psychologists have placed much stress on this fact. However, it seems that, as is so often the case in psychology, the way the question is asked helps determine the answer. For instance, what would happen if you were to ask one group of parents to rate the similarities between their monozygotic (identical) twins and another group of parents to rate the similarities between their dizygotic (fraternal) twins? The ratings would be very different: The parents would report the similarities between the monozygotic twin pairs as very strong and the similarities between the dizygotic twin pairs as quite small. Ask trained observers to rate the twin pairs, however, and you’ll get a different outcome. The monozygotic pairs would still be rated as more similar,
and the dizygotic pairs as less similar, but the differences between the two would be a good deal less than the differences the parents reported. Parents seem to exaggerate the similarities between monozygotic twins and the differences between dizygotic twins (Roisman & Fraley, 2006). When questions about causes of behavior take these factors into account, genetic characteristics seem to play a smaller role in development, and shared environmental factors, such as parenting, seem to play a larger role. Perhaps some of the existing beliefs about genetic effects have given those factors more weight than they should have.

A curious issue about genetic effects involves the question of when in life a genetic factor is likely to come into play. We would expect genetic factors to play their strongest role early in life, before much learning has occurred, and environmental factors to have a greater effect as more learning takes place. But one study found higher correlations between intelligence test scores of elderly twins than between those of younger twins (McClearn et al., 1997). It seems that there may be genetic influences that exist but whose effects cannot be observed in children and adolescents.

Conclusion

It is possible for specific human behaviors to result from specific genetic makeups, but in most cases, behaviors are the result of various combinations of heredity and experience. It’s hard to see how a complex behavior like Susan’s coffee drinking could be determined by genetic factors, and the possibility that the behavior was learned is suggested by the actions of her sister, who is not biologically related but behaves in the same way.

Critical Thinking

1. Use a child development textbook to define the term passive genetic environmental correlation. Describe a scenario that shows this kind of connection among genes, experience, and developmental outcome.

2. Use a child development textbook to define the term evocative genetic environmental correlation. Describe a relevant scenario that is an example of this type of correlation.

3. Use a child development textbook to define the term active genetic environmental correlation. Describe a relevant scenario that is an example of this type of correlation.
4. In studies of separated twins, how would similarities in a twin pair make the twin siblings more likely to reunite?

5. One of the studies described earlier (Roisman & Fraley, 2006) involved ratings of twins by parents and by unrelated observers. Using this study for information, describe the differences in the ratings. Would you expect the parents to rate opposite-sex dizygotic twins as more different from each other (i.e., with lower correlations of ratings), or would you expect the parents’ ratings of same-sex dizygotic twins to have a lower correlation? Explain your answer.

References


