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UCSB Psychology Professors Study Gene-Culture Interaction

Two psychologists at UC Santa Barbara have provided a new twist on the old adage that people are products of both nature and nurture, in introducing a framework for understanding how these influences interact. The researchers are studying how genotypes (nature) can express themselves differently as a function of culture (nurture). Their findings appear in the current issue of the journal *Social Psychological and Personality Science*.

Using the oxytocin receptor polymorphism (OXTR), which is linked to socioemotional sensitivity, Heejung Kim and David Sherman, associate professors in UCSB's Department of Psychological and Brain Sciences, have demonstrated in research funded by the National Science Foundation that individuals can have the same gene, but manifest it differently, depending on their respective cultural experiences. The study involved Korean and American participants, which allowed the researchers to compare the expression of OXTR in people raised in a more collectivistic East Asian society, with that of people who grew up in the more individualistic American society.

"There's a genetic component to psychology that people are studying more and more," said Kim. "The framework of gene-environment interaction already exists and has been very influential. Genes influence people's reactivity to different things, such as environmental sensitivity and stress reactivity." As an example, Kim cited the genetic component to depression. A person can inherit the gene for depression,

but studies show that the gene alone will not make him or her more prone to the condition. "If you have the gene and you are subject to harsh life experiences, only then do you see genetic differences emerging," she said. "That's the gene/environment interaction."

In their research, Kim and Sherman identified culture as the form of environment. "We wanted to see if people's genes lead them to be more -- or less -- environmentally sensitive by examining people in different cultural environments," Kim explained. "If they are more sensitive to their environments, then they should behave in a more culturally consistent way. If I'm an emotionally sensitive person, when I look around my environment and the cultural norms say 'this' is the appropriate way to be, I'm more likely to be that way." Likewise, the person who does not have the gene for that trait would be less likely to adhere to cultural norms.

"One of the oldest questions in psychology is how people are affected by nature and nurture," said Sherman. "Everyone agrees that people are impacted by both, but the gene/culture interaction framework begins to specify how that happens by accounting for cultural variability as well. Depending on an individual's cultural context, the same genotype can lead to very different phenotypes."

The current study examines emotion regulation strategies. Prior research identified that emotional suppression is more common in Asian cultures than in American culture -- people tend to suppress their emotions more in Asia and are less disturbed by doing so. Korean and American participants completed assessments of emotion regulation and were genotyped for OXTR. Among Koreans, those with the GG genotype (the more environmentally sensitive people) reported using emotional suppression more than those with the AA genotype, whereas Americans showed the opposite pattern.

"In terms of gene-culture interactions, our research team has now found results in three different areas of psychology -- emotion regulation, interpersonal interaction in terms of social support seeking, and cognitive style," said Sherman. "Each time, the genotype led to different psychological outcomes as a function of culture."

Noted Kim: "One of the goals of the research in terms of educating the public is that when thinking about genes, it's important to avoid simplistic genetic essentialist thinking. The impact of genes is far more complex than genes directly leading to behavior traits. There is a personal/environmental input, and we're adding cultural

input as well. One of the meta points we'd like to make is that when you look at differences in genetic composition, you can't really assume that you can predict a person's outcome."

Other researchers involved in the study include Professor Shelley Taylor of UCLA; UCSB graduate students Taraneh Mojaverian and Joni Sasaki; and Professor Eunkook Suh and graduate student Jinyeoung Park of Yonsei University in South Korea.

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