Twin study sheds light on genetic influences on loneliness

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A new study in *Behavior Genetics* provides evidence that a genetic predisposition towards experiencing stress is associated with increased feelings of loneliness. The research sheds light the genetic and environmental contributions to the association between stress perception and loneliness.

Previous studies have consistently shown that loneliness carries with it a plethora of negative outcomes, affecting individuals' mental, emotional, and physical health. However, pinpointing the exact risk factors for loneliness has proven to be a complex task. While demographic traits like age, marital status, and income level have been linked to loneliness, other factors

such as unmet social needs and personality traits like shyness also contribute to this emotional state.

But loneliness is distinct from social isolation. Social isolation is an objective state characterized by a lack of contact with other individuals and limited social relationships, essentially describing the physical absence of social interactions. Loneliness, on the other hand, is a subjective feeling of being isolated, involving a perceived discrepancy between desired and actual social connections, regardless of the quantity of social contact.

The researchers behind the new study posited that individuals who perceive situations as more stressful might also experience higher levels of loneliness, and sought to better understand whether this association could be attributed to genetic factors, environmental factors, or a combination of both.

“I’ve always had a strong interest in factors that affect our mental health, especially loneliness, stress, depression, and anxiety,” said study author Ryan Moshtael, a student in the Doctorate of Occupational Therapy program at the University of Southern California.

“I conducted this research for my Honors Psychology thesis with guidance from my mentor, Dr. Christopher Beam, who runs The Lifespan Development & Clinical Geropsychology Lab. He has a particular interest in examining the genetic and environmental influences of sex differences, stress, and loneliness on dementia risk, but agreed to help guide me in conducting the study in relation to the general population, as opposed to focussing on dementia.”

“I thought this specific study would be important because no previous study has been conducted to examine whether the presence of a genetic predisposition for the experience of perceived stress confers a greater experience of loneliness.”

The study leveraged a robust sample of 3,066 twins from the Washington State Twin Registry, a diverse group encompassing both identical (monozygotic) and fraternal (dizygotic) twins. This unique sample allowed researchers to dissect the genetic and environmental influences on perceived stress and loneliness. By comparing similarities and differences between identical twins (who share all their genes) and fraternal twins (who share about half of their genes), the team could estimate the relative contributions of genetics and environment to these feelings.

Participants were asked to complete standardized questionnaires designed to measure their levels of perceived stress and loneliness during the early months of the COVID-19 pandemic. This period was marked by significant stressors, including enforced social distancing and

uncertainty about the future, providing a poignant backdrop for examining these emotional states.

Both genetic factors and individual environmental experiences were found to contribute to the relationship between perceived stress and loneliness. Specifically, the study revealed that a portion of this association could be attributed to genetic variance, suggesting that some people might be genetically predisposed to both higher stress perception and feelings of loneliness. However, environmental factors—especially those unique to an individual's experience—also played a crucial role, accounting for a significant portion of the variance in loneliness levels.

"The big takeaway from my study is that the results imply that genetic and environmental differences in individuals cause certain individuals to experience greater levels of loneliness as a result of their perceived stress than others," Moshtael told PsyPost. "In other words, people who have a predisposition to perceive life events to be stressful due to their inherited genetics may be more susceptible to feeling lonelier irrespective of their environmental experience."

Interestingly, the impact of these genetic and environmental factors was consistent across genders, challenging previous assumptions about the differential effects of stress and loneliness in men and women.

"I was surprised to find that the genetic correlation between loneliness and perceived stress was not significantly stronger in women than men given the increased prevalence of the experience of perceived stress and loneliness in women as compared to men," Moshtael said.

But the researchers caution against drawing causal conclusions from their findings, noting the observational nature of the study. The unique circumstances of the COVID-19 pandemic also raise questions about the generalizability of the results to other contexts.

"As the data used in this study was collected during the COVID-19 pandemic, it may not generalize beyond the span of the pandemic," Moshtael noted. "Also, as the data in this study were cross-sectional and observational, no causal conclusions can be reached in terms of the association between perceived stress and loneliness; one can only take away that perceived stress and loneliness have a common genetic etiology."

Nevertheless, the study opens new avenues for understanding the complex interplay between stress, loneliness, and the genetic and environmental factors that influence these experiences.

“I intend for the findings of this study to be used to inform future intervention studies designed to increase social connection and combat the deleterious health effects of perceived stress and loneliness,” Moshtael said. “I have decided to pursue the clinical route, as opposed to research, so I do not have any immediate plans for personally building on the findings of this study. However, I hope that others can benefit from and build on the findings of this study in future research, so that myself, and others, can use it to inform interventions we utilize in future clinical practice.”

The study, “A Genetically Informed Study of the Association Between Perceived Stress and Loneliness,” was authored by Ryan Moshtael, Morgan E. Lynch, Glen E. Duncan, and Christopher R. Beam.