New research could lead to better identification of human vulnerabilities

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In his book, David Geary recommends that by better assessing sex, age, and species specific vulnerabilities, future studies can assess whether biological traits are more sensitive to social stressors, disease and poor nutrition. Credit: Mizzou News

Historically, males have been considered the vulnerable sex, sometimes called "male vulnerability." Charles Darwin noted that boys are more likely to die in infancy than girls and have a higher risk of premature death throughout their lifetimes. Now, a researcher at the University of Missouri suggests that research in "male vulnerability" should be expanded to include "female vulnerability." Using evolutionary theory
and basic biological principles, he proposes a method for identifying when specific traits, such as height or language abilities, are more easily compromised in one sex or the other or at some ages but not others. Identification of age-, sex-, and trait-specific sensitivities will enable a more comprehensive assessment of how disease, poor nutrition, social abuse and environmental toxins undermine human wellbeing.

"If we want to fully understand risks to people, then we have to understand the traits that are most likely to be compromised by these risks, the ages at which stressors are most likely to compromise them, and the different ways in which boys and girls and men and women can be affected," said David Geary, Curators Professor of Psychological Sciences in the College of Arts and Science at MU. "Most previous studies of risk, such as toxin exposure or social maltreatment, have thrown males and females or young and old people together in ways that fail to recognize age-, sex- and trait-specific vulnerabilities. If we don't measure the right trait or measure it at the wrong time or in the wrong sex, we'll miss many negative consequences of risk exposure. The method I'm proposing will allow researchers to identify these very specific risks ahead of time and ultimately prevent or ameliorate their expression."

To evaluate the method, Geary reviewed thousands of studies across 125 species of birds, fish, insects and mammals, documenting age- and sex-specific vulnerabilities in key traits. The specific vulnerabilities can vary across species and sex, but are tied together with a simple concept: the development and expression of traits that have been elaborated over evolutionary time are easily disrupted by exposure to environmental and social stressors.

Geary applied the same concept to people identifying age- and sex-specific vulnerabilities including physical traits, such as pelvic development; behavioral traits, such as children's play; social traits, such
as development of social relationships; and cognitive traits, such as language and spatial abilities. He found that exposure to risks, such as environmental toxins or extreme social stress, will compromise these traits and more so for one sex or certain ages.

In a new book focusing on two decades of his evolutionary psychology research, Geary uses this method to address questions about vulnerabilities. Among other topics, he discusses why women's language competencies are more affected than men's during the early stages of Alzheimer's disease; why adolescent boys' height but girls' pelvic development is more compromised by poor nutrition; why boys' play behavior is more easily compromised by prenatal exposure to toxins; and, why anorexia compromises girls' and women's ability to read social cues.

"This seemingly arbitrary mix of age, sex- and species-specific vulnerabilities should be viewed with different filters for future research," Geary said. "By identifying and studying these traits, researchers should be able to determine specific impacts caused by disease, poor nutrition, social stressors, and exposure to man-made toxins and draw better conclusions for individuals based on age, sex- and species-specific traits."

Geary's book, "Evolution of Vulnerability: Implications for Sex Differences in Health and Development," outlines the list of sex- and age-specific traits that he feels will be important for future study. Published by Elsevier, it is available this month.

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