Chronic family turmoil and other problems cause physical changes

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Adolescents who are chronically exposed to family turmoil, violence, noise, poor housing or other chronic risk factors show more stress-induced physiological strain on their organs and tissues than other young people.

However, when they have responsive, supportive mothers, they do not experience these negative physiological changes, reports a new study from Cornell.

But the research group also found that the cardiovascular systems of youths who are exposed to chronic and multiple risk factors are compromised, regardless of their mothers' responsiveness.

The study, led by environmental and developmental psychologist Gary Evans, is published in the March issue of *Developmental Psychology*. It is the first study to look at how maternal responsiveness may protect against cumulative risk as well as the first, according to the researchers, to look at cardiovascular recovery from stress in children or youths.

Evans said that the findings suggest that the physiological toll of coping with multiple risk factors is significantly greater than with that of coping with a single event, even if that event was rather severe. "Moreover the burden appears to register in physiological systems that help us regulate our responses to stress," said Evans, the Elizabeth Lee Vincent Professor of Human Ecology and professor of human development and of design and environmental analysis in Cornell's College of Human Ecology.

To study stress-induced physiological changes in young teens, the researchers -- including three students who were undergraduates at the time and a graduate student -- used an index called allostatic load. This is a measure of stress-induced changes in neuroendocrine hormonal systems, cardiovascular responses and metabolism that indicate the severity of wear and tear that cumulative strain puts on organs and tissues.

"Allostatic load may very well turn out to be the primary mechanism of how risk, stress and other sources of environmental demands get under the skin and into the body," said Evans.

In some studies, he noted, high allostatic loads are correlated with a greater incidence of physical, mental and cognitive disorders. The new data, Evans said, may therefore explain, at least in part, "why income and racial inequalities are so pervasive and persistent in our society. Low-income kids and especially low-income kids who are nonwhite bear a disproportionate burden of cumulative risk exposure."

The researchers also found that when stressed by a mental arithmetic problem, the cardiovascular systems of adolescents who had been exposed to chronic risk factors responded less actively to the stressor and were slower to physiologically recover.

The results are based on surveys, blood pressure measurements and urine samples from 207 seventh- and eighth-grade children in rural upstate New York who had participated in a first wave of the study while they were in elementary school.

"We oversampled low-income children given our interest in risk and poverty," said Evans. He said they chose a rural, white community "given that the majority of children in America who are poor are white and that rural poverty constitutes greater and more persistent material

deprivation than urban poverty."

Source: Cornell University News Service