

# STRESS RESPONSE IN EARLY CHILDHOOD: WHO'S RESPONSIBLE?

**Early childhood is a vulnerable period when it comes to developing a healthy physiological response to stress. In adverse family situations, environment has been found to play an even greater role in stress response than genetics. These findings have important public policy and societal implications and raise important questions for future research.**

The effect of the environment on gene expression, a process known as epigenetics, "is thought to be both stable and reversible," says lead investigator Isabelle Ouellet-Morin. "This makes it a good target for studying the early influence of adverse environments on development and ... to eventually think of reversing this long-term cost in some children." She conducted the research while a PhD student at the Université Laval. Today she is at King's College London in the United Kingdom.

## MEASURING A PHYSIOLOGICAL RESPONSE TO STRESS

Ouellet-Morin and her colleagues measured levels of the stress hormone cortisol in the saliva of 346 19-month-old twins living in Quebec. Some of the twins were fraternal, meaning they shared 50% of their genes, while the others were identical, meaning they shared 100% of their genes. Cortisol measurements were taken both before and after they were presented with an unfamiliar (i.e., stressful) situation. The resulting changes in cortisol are an approximate measurement of the children's physical stress reaction.

The researchers also assessed the degree of family adversity faced by these children and looked at whether their physical reaction to the stress of the unfamiliar situation was affected by the amount of adversity in their family. Family adversity included stresses faced by the children while still in the womb, such as their mothers smoking during pregnancy, as well as stresses they faced after they were born, such as low family income or educational levels and hostile reactions from mothers.



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## FAMILY ADVERSITY AFFECTS THE STRESS RESPONSE

The researchers next analyzed their findings to determine the degree to which genetics and/or the environment influenced the children's physical response to stress. They found that among children with a low family adversity background, both environment and genetics played a role. But among those with a high degree of family adversity, environment was the key factor in the stress response.

"The genetic differences tend to pale in comparison to the impact of environment when familial adversity is higher. In other words, stressful environments trump genetic influences," says Janice MacAulay of the Canadian Association of Family Resource Programs. "This means family adversity and multiple stress factors when children are young have an impact

that's likely to influence their life course. This is important in terms of provision of programs and services in this country because every child deserves a good beginning."

"Early adverse environments affect cortisol response to novelty, a change that may remain unnoticeable at the behavioural or cognitive levels for years, but nevertheless could increase the risk for these growing children to suffer from mental and physical pathologies later in life," says Ouellet-Morin. Still, she recommends prudence when it comes to drawing conclusions on the impact of this study, since it does not tell us which specific interventions aimed at helping families with young children will actually have an impact. That's clearly an important question for future research. 🦋

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