

The development of children and the health of societies

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Our central responsibility as human beings is to equip our children for life, to enable them to become capable, civilized adults, and to be better than we are.

We are not doing a good job in Canada. In Montreal, Quebec, as in many other Canadian cities, approximately one-third of children grow up in poverty and as many are not ready for school because of developmental delays. In 2008, approximately 35% of Montreal children were not ready for school. In the most disadvantaged areas, this rate rose to 46% (1). These findings represent a human and a social disaster. However, after one day's headlines and another of comment, this was, like yesterday's news, forgotten.

Especially in the present economic climate, how can we sideline one-third of our future population from fruitful participation in a society that needs them?

Whom do we find behind these numbers? We find children who have developmental delays in language, motor and social skills; they have a reduced attention span and abnormal activity levels.

What is their family history? Parents of these children often have a small family circle and lack a support network. They feel isolation, exclusion, insecurity and discrimination. They have few opportunities or choices. They lack access to transportation and are often un- or underemployed. Their housing is poor. They have a high incidence of chronic illness. As a consequence, the parents do not feel good about themselves – they feel 'down' and are often depressed. They are tired of struggling, often afraid and frustrated, and their minds are filled with worries. Things appear hopeless, and their dreams die. Substance abuse is common. In these circumstances, their behaviour toward their children is characterized by impatience and an inability to listen. They never have time to pay attention to their children. Bedtime stories are rare, but neglect and abuse of all kinds are common.

What is the child's experience? A child growing up in this environment is likely to lack attention, love, food, sleep, positive stimulation, good experiences, opportunities to test him- or herself, consistency, praise and a feeling of success. Abuse is frequent. The physical environment is poor. It is noisy, dirty, unsafe and filled with traffic. There are few public sports facilities or parks to play in.

What do we find on examination? These children are likely to be tired, hungry and have little interest. Their activity levels may be abnormal, their impulse control poor and they may lack empathy. There is a reduced capacity to learn, which accentuates feelings of failure. Social skills are poor and recourse to violence is frequent. Dreams are absent or die early. Their life takes place in a blighted urban environment that offers little contact with nature or cultural activities.

What do we find on follow-up? The child's story is likely to be one of school failure, resulting in a lack of education and poor skills that lead to early unemployment. Then there is frustration, rebellion and violence. Disappointment, exclusion and a poor self-image lead to drug abuse, illness and antisocial behaviour. There will be a huge need for public services – health, support, rehabilitation, security – and a shortened lifespan.

We know that social conditions have a strong impact on the health and longevity of people according to the stress level under which they live (2).

We have a better understanding of the basic science underlying the relationship between the environment and the development of the human being. An infant's brain develops progressively from simple structural frameworks to more complex internal relationships in response to the intensity, frequency and nature of sensory and perceptual experiences. Positive experiences, by their frequency and intensity, strengthen pathways, increase interconnections between brain cells and build capacity (3). The brain's development is influenced most strongly before the age of three or four years, after which, its capacity to change reaches a lower steady state by approximately six or seven years of age (4).

We have learned that stress, when caused by persistent adversity, becomes toxic because of its severity and duration. The resulting overstimulation of the hypothalamic-pituitary axis leads to a prolonged increase of steroid secretion, resulting in the death of cells in certain areas of the brain, to a delay in forming connections with higher brain centres as well as to a loss of connections already made.

What is the result? The result is a smaller brain (5), a lower IQ and an abnormal function (6). This altered

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Accepted for publication May 8, 2009

function is expressed as a decrease in attention span, control of activity and emotions, ability to learn, and empathy. Impulsivity is increased, as is an early recourse to violence.

By the time the child becomes an adult, the continued high steroid levels cause an increased incidence of chronic diseases: diabetes, cardiovascular disease and cancer (7). Life ends early.

We have known for some time that environmental and family stress have an influence on the development of early menarche and pregnancy in girls (8). Now we understand the mechanism.

Toxic stress changes the expression of our genes. Research has shown that pregnant animals, if stressed, give birth to female offspring that become fertile earlier than normal, behave differently and become pregnant when very young. These stress-induced biological changes seem to be inherently stable and persist into the next generation (9).

Does this apply to human beings? In Montreal, the teenage pregnancy rate in the Centre Local de Services Communautaires area of Lac St-Louis is 10%. In the Centre Local de Services Communautaires area of Hochelaga-Maisonneuve, being one of Montreal's poorest, where social stresses are high and where the incidence of children's lack of school readiness stands at 46%, the teenage pregnancy rate is 65% (1).

CONCLUSION

What have we learned about child development? We have learned that genes and experience determine brain structure; that brain structure and capacity develop progressively from the simple to the complex in response to the intensity, frequency and nature of sensory and perceptual experience; that toxic stress during pregnancy and in early childhood leads to damage of the brain's structure, and to persistent changes in the function of the nervous and hormonal systems that lead to potentially lifelong problems with learning, behaviour, mental and physical health, and to a shorter life; and that such stress during pregnancy can lead to a change in the phenotypic expression of the genome. We have learned that assuring favourable conditions for

development in early childhood is better than early intervention, which is better than late intervention. We know that normal child development leads to a capable adult, to a productive and civilized citizen, and to a prosperous, sustainable society. On the other hand, we have learned that abnormal child development leads to an incapable adult who is likely to be a dependent, nonproductive citizen prone to exhibit antisocial behaviour and to be both a burden and a danger to society.

The root cause of these problems is the nonrespect of the rights of the child. The social determinants of health find their equivalent expression in the United Nations Universal Declaration of the Rights of the Child (10). We have not respected them and yet we claim peace, order and good government to be our touchstone. Are we living up to our ideal?

Every child comes with the message that God is not yet discouraged of Man.

—Rabindranath Tagore

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