



2008. Mayan girls born in the USA, Lake Worth, Florida (USA). These girls are taller than their counterparts in Guatemala, Mexico, and Belize. However, the United States lifestyle and the loss of Maya culture bring about health problems such as overweight, high blood pressure and other non-communicable diseases. Photographer, Barry Bogin © Barry Bogin

Why love and hope are crucial for healthy physical growth in humans

It is now Springtime in the Northern Hemisphere —the greatest season for love and hope. And there is no greater feeling of love and hope than that between parent and child. The bond is powerful, and it can be measured —quite literally measured— in centimetres or inches. My article «[What makes people grow? Love and hope](#)» reviews evidence that the intersection of love and hope support emotional wellbeing, favourably regulate neuroendocrine activity, and promote greater growth in height.

When I write and speak about love and hope in relation to human biology —including human physical growth, development and health— I am referring to feelings of security that come from attachments to other people. Love in this context may be defined as a secure attachment to another person or group of people, such as a family or neighbourhood community. Former United States Surgeon General Vivek Murthy [explains](#) «[...] do we continue with the status quo, marked by pain, disconnection, and division? Or do we choose a different path —one of joy, health, and fulfilment, where we turn toward each other instead of away from each other; where we choose love over fear; where we recognise community as the irreplaceable foundation for our wellbeing?».

Secure personal and community attachments are likely to be safe from threats and remain intact. This gives people the feeling of hope for the future. In my academic writing I often cite anthropologists Robert LeVine and David Lacey who focus on [attachment across human cultures](#). LeVine emphasises that parents and societies around the world share similar goals for their offspring: 1) survival and the health, 2) develop into a self-supporting adult, and 3) incorporate cultural beliefs and behavioural norms. Lacey describes the myriad of ways that parents and other older people form attachment with infants and children, who are often not considered human until transformed into persons by surviving and by developing a shared attachment to the cultural norms of their community, including the social, religious, educational, economic and political institutions and systems.

In this context, I am not referring to the romantic or sexually physical meanings of attachment or love. In my aforementioned article «What makes people grow? Love and hope» and in [other articles](#) and my book [Patterns of Human Growth](#) I focus on the feelings of love and hope that people may have for their local, national or global communities —such as when people say, «I love my school», «I have strong hope for my country», or «Love the planet». In these cases, people are using the words *love* and *hope* to express their feeling of security that comes from a belief that their community or institution is not threatened or threatening and will provide safety for the foreseeable future. So, it's not just love between parent and child that affects children's growth but a much broader sense of social attachment.

Most of you reading this likely receive and give much love and hope. Doing so makes us feel good and also promotes hormonal and nervous system activity that regulate skeletal growth. Three neuroendocrine systems centred in our brain's hypothalamus are especially important: 1) the growth hormone/insulin-like growth factor I (GH/IGF1) axis, 2) the oxytocin/bone formation pathway, 3) the hypothalamic-pituitary-adrenal (HPA) axis. GH/IGF1 hormones powerfully increase growth in length. More GH/IGF1 during the growing years results in greater height. Oxytocin, sometimes called the «love hormone», promotes bone formation and blocks fat tissue formation. Physical or emotional stress activates the HPA axis and the hormones produced by the adrenal gland can slow or stop bone growth and promote fat storage on the body. Feelings of love and hope are converted by the hypothalamus into the bone growth stimulating hormones, while the stresses of hunger, neglect, fear, pain and hopelessness stunt bone growth and stimulate fatness. What this means is that feelings of love and hope allow us to grow taller, which is a sign of better health, and reduce risks for obesity and chronic diseases, which plague our societies. Given its power, Marissa J. Levine and Mary Ann Cooney propose «[Love as a Public Health Intervention](#)» .

I have documented the emotional-to-physical effects of love and hope on human growth in [my work with children and their families in Guatemala](#). The history of Guatemala is one of a [lack of love and hope for most of its people due to more than 500 years of threats and insecurity](#). An ecology of fear and hopelessness started with European Conquest in the year 1500 ACE and the ensuing century of repression, enslavement and near extermination of the Indigenous Maya people. Maya population numbers recovered, with [at least 7 million alive today](#), but most continue to [live in poverty with food, housing, and health insecurities](#), as do the majority of the non-Maya population in Guatemala.

The many governments of Guatemala —colonial, military and civilian— failed to provide social and economic support for the country. The leaders failed to love the people.

Without the love of social, economic and political security there is no hope and this results in chronic feelings of stress and less physical growth. Today, [Guatemalan women are the shortest of all national groups](#), and Guatemalan

men are fourth shortest. My research shows that the short stature of Guatemalans is directly linked to the amount of a governments' love of its people. [The children of Guatemalan migrants born in the United States](#) are four to five inches (10-11 cm) taller than their own sisters and brothers who were born in Guatemala. About half of the difference is due to better nutrition and health care. The other half of the height increase is due to freedom from fear of violence and insecurity in Guatemala and hope for a better future in the United States.

At this Springtime let us think about ways to promote more love and hope in our communities and better healthy physical growth for all our children.

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See the videos:

[Measuring the Impact of Love and Hope for Individuals and Society](#) (2023 Nova Annual Conference on the «Seeds of Change: Inspiring a Better Future»)

[The boy who died chasing an American dream](#) (BBC News, 8 April 2019)