Social-Economic-Political-Emotional (SEPE) factors regulate human growth

Bogin, Barry\*

\* University of California San Diego / Salk Center for Academic Research and Training in Anthropogeny (carta.anthropogeny.org), School of Sport, Exercise & Health Sciences, Loughborough University, UK

Abstract

**Background:** There is a recurring and seamless interaction between the biology of human development and the social-economic-political-emotional (SEPE) environment. The SEPE environment influences the quality of the material conditions for human biology and, simultaneously, human growth in height and other dimensions provide social and moral signals that provide information to community networks.

**Objectives:** This article reviews the role of SEPE factors in human growth, especially skeletal growth.

Sample and Methods: The meaning of SEPE is defined and shown to be related to individual and group prestige, to social identity, and to ego and task motivation. These influence dominance or subordination of communities and the material and moral conditions of societies. Historical and contemporary examples of SEPE effects on skeletal size are presented.

**Results:** Membership in a SEPE community impacts skeletal size in height and breadth. Higher SEPE classes are taller, lower SEPE classes are broader. In elite level sport the winners have more growth stimulation hormone IGF-1 even before the contest. These findings are explained in terms of dominance versus subordination and the Community Effect in Height hypothesis.

**Conclusions:** SEPE factor regulation of human growth is shown to be a more comprehensive explanation for plasticity in height than traditional concepts such as socioeconomic status and simple-minded genetic determinism. People belonging to upper SEPE class communities, the elites, know that they are superior and are treated as such by the non-elites. The material and moral condition for life operating through these community social networks provide positive stimulation for the elites and negative stimulation for the lower SEPE classes. These differences maintain the gradients in height between SEPE communities in human societies.

Orcid numbers

Bogin, Barry 0000-0002-1688-0087

Key words

prestige, dominance-subordination, social identity, ego motivation, material and moral conditions, community effects

Take home message for students: The basic pattern and stages of human growth are shared by all living people and is the outcome of the evolutionary history and biocultural nature of our species. Social-economic-political-emotional (SEPE) factors are created by every human culture and these factors create material and moral conditions that impact human growth.

Conflict of Interest: None

Introduction

The basic pattern and stages of human growth are shared by all living people (Figure 1). This pattern is the outcome of the four-to-seven million-year evolutionary history of the hominins -- living human beings and our bipedal fossil ancestors. The way each human being grows within the basic pattern is the product of an interaction between the biology of our species, the material-physical environment in which a person and his recent ancestors lives, and the social-economic-political-emotional (SEPE) factors that every human culture creates. Thus, human growth and development reflect the evolutionary history and biocultural nature of our species [(Arsenical Pesticides, 1975](#_CTVL00111f50233db8b4f399a2fbc97f7daa2a3)[; Acharyya et al., 1999](#_CTVL00140a62243db1942acb8b26057f8bcff6b)[; Braman, 1975](#_CTVL001e00b3f93f5254434bb159bd836e739e9)[; Goodenough, 1963)](#_CTVL0018030c08a39b94642b79f4291a2bab81c)

Figure 1 The basic pattern of human growth. Average distance (A) and velocity (B) curves of growth in height for healthy girls (dashed lines) and boys (solid lines). Distance is the amount of height achieved at a given age. In part A, the image shows a child’s height being measured. Velocity is the rate of growth at a given time, in this case shown as centimeters per year. In part B the running figure represents “velocity.” The velocity curves show the postnatal stages of the pattern of human growth. Note the spurts in growth rate at mid-childhood and adolescence for both girls and boys. The postnatal stages: I, infancy; C, childhood; J, juvenile; A, adolescence; M, mature adult. The average values shown in this figure are based on northern European girls and boys. While almost all healthy, full-term newborn humans average ~50 cm in length, with a range of 48-52 cm, amounts and rates of growth soon begin to vary both within and between populations. The average adult height of women and men across 202 nations and territories of the world (no Pygmy groups) has a range of 20 cm for women and 23 cm for men (84). Original figure, B Bogin.

SEPE factors

This article focuses on the SEPE factors. I have been developing the concept of SEPE factors since 1974, when I began my research on human growth in Guatemala. Since then my research took me to projects in Mexico, the United States, South Africa, Portugal, the United Kingdom, and Spain. Participants in the research were from these countries or were immigrants from Guatemala, Cape Verde, and Bangladesh. The geographic and cultural diversity of the people who graciously agreed to participate in the research had much impact on me professionally and personally. From my interactions with them and from learning about their countries of origin and their lives I came to appreciate the central role that SEPE factors have in human growth and development.

Table 1 Mean (SD) IGF-1 levels (μg/L) 24 hours before and 24 hours after the game by win or lose.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Win n=55 |  | Lose n=46 |  |  |
| Pre | 47.8 | (14.8) | 43.1 | (14.9) |  |
| Post | 46.8 | (16.5) | 42.8 | (14.3) |  |
| Mean  IGF-1 | 46.2 | (13.8) | 41.6 | (12.4) | p=0.04 |

\* table-sub

The subordinate or dominant status of people in a society is related to the concept of socioeconomic status (SES) but not identical to SES. In its most widespread usage, SES is a concept devised by the social scientists, statisticians, and the governmental tax authorities to measure some aspects of education, occupation, and social prestige of a person or a social group. One early usage was by the psychologist Raymond Cattell (1905-1998) who claimed that the essence of socioeconomic status was the “prestige factor” (8). Prestige was derived from a person’s occupation and was more important than income, property, or education, but prestige was highly correlated with these. Cattell (p. 300) wrote that,

*Social status, in short, is a purely psychological entity. Such a statement must not be taken to mean that it is not real or that it cannot be measured or that it is not a precisely definable concept. It is to be defined and measured in terms of behavior, implying mental states behind behavior. The prestige of an occupation is resident in the minds of all people in the community and is to be measured by assessing their attitudes towards it at a given time.*

???Text Box 1. Definitions and brief description of the terms strategic growth adjustments, community effects, dominance-subordination, social identity, ego motivation, and task motivation. Further discussion is found in the main text.

SEPE factors and the Material & Moral Conditions of Society

The concept of SES is part of the SEPE factors hypothesis for human growth regulation. SES, however, does not capture the nature or causes of strategic growth adjustments and community effects in height. As used by many researchers today SES also fails to capture the emotional nature of prestige and its impacts on dominance-subordination, ego motivation, and task motivation. SEPE goes beyond SES to capture these by addressing the material and moral conditions of the community and larger society. The role of material and moral conditions on physical growth was observed by James M. Tanner (1920–2010), a growth researcher and historian of social medicine. Tanner stated that human growth provides a ‘mirror’ of the human condition, reflecting the “…material and moral conditions of that society” (14). These material and moral conditions have joint, interactive impact on the growth and development of young people. Ever since Tanner, the ‘growth as a mirror’ metaphor has been widely used (15,16).

Inherent in the SEPE factors hypothesis of human growth are the ‘material and moral conditions’ of a society or nation, and it is the importance of those conditions which further justifies the association of the words ‘social-economic-political-emotional’. Within the SEPE factors perspective there are testable hypotheses about the regulation of human growth. The following is a list of how each SEPE term relates to prestige, dominance-subordination, ego motivation, material and moral conditions, and citations to the hypothesis testing:

* *Social* refers to the community, to the network of all things ranging from **material** items to **moral** imperatives that are communal and shared by groups of people, even nations, operating in private and public arenas. The **material-to-moral** assets of social networks and the differences in **prestige dominance-subordination**, **social identity**, and **ego motivation** of people within the network create much of the living conditions of their community. This *Social* aspect of SEPE is formalized in tests of the community effects hypothesis (1, chapter 8, 17,18, and other citations given previously).
* *Economic* – refers to financial and monetary basis of community, social network, and nation. Anthropological research finds that all human groups have economic systems, including pre-industrial societies such as foragers (gatherer-hunters), pastoralists, horticulturalists, and pre-industrial, hierarchical state societies (e.g., ancient Egypt, Rome, Aztec, Maya, Vedic, and African Kingdoms of Kush and Zimbabwe; medieval Europe, China, Japan). The Economic aspect of SEPE focuses on production of goods and services, trade and costs, and the degree of inequality in these that create distributions of wealth or poverty. These have direct bearing on **material** and **moral** foundations of a society and the **prestige**, **dominance-subordination,** and **social identity** of its members. Marcel Mauss wrote eloquently and passionately about these in his book *The Gift* (*Essai sur la don*, 1925). This book is a sociological/anthropological classic on the economics, politics, and morality of exchange in non-western and ancient societies. People everywhere possess a fantastically detailed ‘mental ledger’ of exchange and according to Mauss this is because the purpose of exchange is not to amass ‘profit’, but rather to amass **prestige** and to ward-off **moral turpitude**, that is, acts or behaviors that violate the accepted standard of the community. A person avoids **moral** transgression and accrues greater **social identity**, **prestige**, and **dominance** by meeting responsibilities for economic, political, religious, and ethical obligations.

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Barry Bogin, PhD

University of California, Fantasystreet 12-15, 1035 San Diego, USA

**b.a.bogin@lboro.ac.uk**