

INTRODUCTION TO ANTHROPOLOGY

Human Variation

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E. Adaptation and Variation

1. Adaptation is the process by which organisms cope with nature's stress.



Adaptation explains variation.

Three types of human adaptation exist:

- i. Genetic adaptation** (long-term evolutionary change, as with mutation or genetic drift/flow; occurs over many life spans to entire populations);
- ii. Acclimatization** (short-term non-genetic biological change, as with adaptations to altitude or immune resistance – occurs to individuals during their life span);
- iii. Cultural change** (non-biological change, as with technology or culture).

Bio-cultural coevolution describes how the two forces, biological and cultural, interact.

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2. Aspects of Human Variation:

a. Weight and Body Build

(endomorph \longleftrightarrow ectomorph)

i. Related to environmental temperature (climate)

ii. Bergmann's rule: Body Weight

Hot climate, low body weight vs.

Cold climate, high body weight

(see Figure 4.1, p.63)

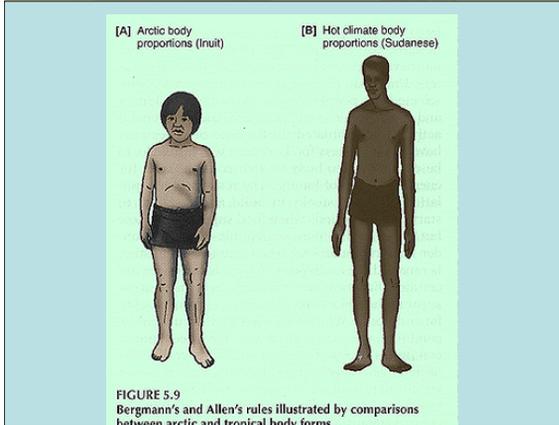
iii. Allen's rule: extension of arms and legs

Hot climate, longer limbs

Cold climate, shorter limbs

WHY? Physiological efficiency

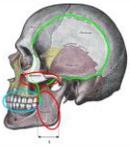
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b. Facial Construction: The Nose Related to climatic humidity



The nasal passage and sinuses act as a "humidifier/radiator."

i. Long, narrow noses are common to humans living in colder, less humid climates of the north (they act as a better humidifier in dry, cold air).



ii. Flat, broad noses are common to humans living in hotter, more humid climates like the tropics (they act as a radiator, eliminating excess heat and moisture).



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c. Height



i. Related to climate (but not causally: see Bergmann's/Allen's rules). Ex: the Samburu or the Nuer of Eastern Africa.

ii. Cultural differences: social class can influence height (due to nutritional factors)

iii. Infant Stress?? (ex: circumcision, branding, piercing, molding, vaccination)



Tallest Populations of the world: the Dutch of Holland



Shortest Populations of the world: the Mbuti "pygmies" of Zaire; Why so short?



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c. Skin and Hair Color

i. **Gloger's Rule:** in birds and mammals, more melanin (pigment found in skin, feathers, or fur) exists in populations found in warmer climates.

ii. In humans, skin color is a function of the amount of **melanin** found in epidermal cells and by the amount of blood flow to the capillaries in the skin.

iii. **Skin color may be a response to sunlight:** Darker color avoids too much ultraviolet radiation, whereas light color ensures enough Vitamin D absorption.

Web: - [Where does skin color come from?](#) ~ MAP
see p.69 text

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e. Health and Disease



i. Infectious diseases

- Myxomatosis in rabbit or tuberculosis and Jews
- Measles/smallpox and native populations: **Genetic homogeneity (sameness)** increases susceptibility

ii. Lactase deficiency



Lactase 1 enzyme is related to calcium processing; Both L1 and Vit D (source=sun) *absorb calcium* into the body, thus **Less Sun = More Lactase1**

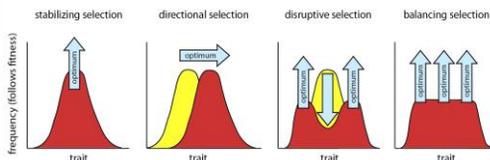
iii. Sickle cell anemia (*sickleemia*)

- HbS/HbA heterozygous individuals are less susceptible to malaria infection; an example of **balancing selection**

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d.iv. Varieties of Natural Selection



e. Artificial selection refers to man's influence on genetic selection (e.g. *Heiki crabs*, *"fishberries"*)

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3. Traditional Definitions of Race and Ethnicity



a. Race:

Common biological traits deemed "socially significant" – they are **genetically inherited**.

Common racial types **once** deemed significant by anthropologists (a hundred years ago) included:

- **Caucasian**: light skin, fine hair
- **Negro**: darker skin, coarse hair
- **Mongolian**: brown skin, distinctive eyes

The Reality: There are so many different combinations of racial traits around the world that no simple scheme of three major racial types can do justice to them.

b. Ethnicity:

Common cultural traits deemed socially significant – they are **culturally inherited**.

For example, common heritage, language, religion, holidays, food, etc.



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c. Contemporary Definition of Race



i. "Race" is traditionally defined by the biological differences that exist between individuals.

But if it is defined only as *biological differences*, can't we claim that **everyone** is different and unique, that everyone **VARIES** from one another as a principle of natural selection?



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c. Race and Anthropology



ii. **Race is** not black and white, yellow and red. It is truly described as a **broad continuum** of colors and types.

The Problem: Where do you draw the line? **Where and when should you define difference? What does it mean?**

As a scientific classification system, the concept of race is troublesome, because the lines are so blurry. *For social purposes, we turn to dualism (black and white), but for scientific purposes this system doesn't work.*

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iii. Race is a subjective social construction –an attempt to make some order out of the reality of noticeable biological difference.

Racial categorization is common throughout the world. **Why?** The visible differences in biology – skin color, facial structure, height, etc. - separate people from one another because they are obvious. But less obvious differences in biology – blood-cell structure, genetic predisposition to disease, differences at the cellular level – are **not** seen as indicators of race.

When the explanation of human difference goes beyond the *biological* and into the *cultural*, **racism** can emerge and people then make those differences *important* to the social order.

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iv. For scientists, does “race”, in the context of the concept we currently have, **even exist?**

Or is it just another social agreement, a **social norm so widely taken for granted that most won't question or confront it?**

Many scientists today are giving up on the concept of race as a useful tool for understanding humanity. While we can study human variation, race is a concept best left to sociologists.

Eric Liu:
**“What maketh a race is not God, but man.
What maketh a race is only the sin of self-love.”**

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