Last time · What are the sources for human variation? · How do humans vary across geography? · What is a cline? Last Time · What forces have been responsible for shaping modern human variation? What have humans adapted to? How has culture impacted adaptation and vice versa? · What are the different ways of adapting to an environmental stressor? Adaptation · What is adaptation? · What is genetic adaptation? · What is acclimatization? · How do these shape human variation? Studying Human Variation a Biocultural approach Biology is intertwined with human cultural behavior

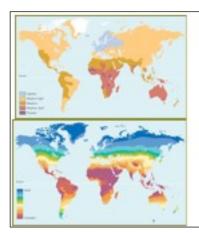
and both shape human diversity

We have evolved through the 4 forces of evolution intertwined with cultural behavior

Can you give an example of how culture has created a selective force in human evolution?

What do humans need to adapt to?

- Solar Radiation
 - · too much or too little
- · Heat and Cold
 - Bergmann and Allen rules
- Altitude / Humidity
- Disease
 - sidde cell anemia
- Diet
 - Lactose tolerance
- · What else?



Skin color and solar radiation

Heat and Cold Volume = 2 × 2 × 2 = 8 or Volume = 1 × 2 × 4 = 8 or Surface oren = (2 × 200 orled) = 24 ore Volume = 1 × 2 × 4 = 8 or Surface oren = (1 × 200) = (3 × 400) = (3 × 400) = 28 ore Volume = 1 × 2 × 6 ore



Altitude





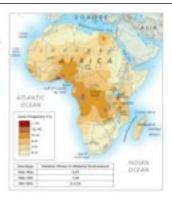
Andes

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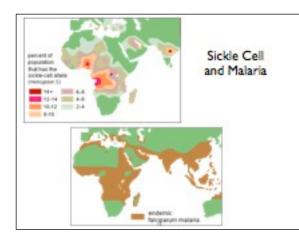
Disease: Malaria +Sickle cell



Clinal map of Sickle Cell



-



	Relative fitness		
НЬАНЬА	0.85		
HbAHbS	1.00		
HbSHbS	0-0.33		

4

What have humans adapted to?

 Can you name at least one environmental stressor, how it can impact fitness, and how humans adapt, culturally, behaviorally, physiologically, and genetically to that challenge?

...

What does all this variation add up to?



11

What is Race?

Biological?

Cultural?

Linnaeus



Homo sopiens afer Homo sopiens americanus Homo sopiens asiaticus Homo sopiens europaeus Homo sopiens ferus

Blumenbach



Even while saying all this was arbitrary...

"There is but one species of man....

...All these differences, run so insensibly, by so many shades and transitions one into the other, that it is impossible to separate them by any but very arbitary limits"

Ten Facts about Human Variation

Jonathan Marks

http://personal.uncc.edu/jmarks/pubs/tenfacts.pdf

FAHV 6:

There is much more variation within groups as between groups (polytypy)

FAHV 9:

Humans have little genetic variation

Biological?

- Measure biological difference between populations?
 How different are human populations?
- Fst = statistical measure of the fraction of variation found between human samples
- Fst 0 means no difference, Fst 1 and the two populations are completely different at the locus or loci.

Fst

- Biological subspecies require Fst of at least 0.25
- Looking at multiple human loci, Fst ranges from 0.03 - 0.17

-

Between 83-97% of our genetic
variation is found within
populations, and only between
3-17% between populations

Yanomamo v. Lapplander





FAHV I:

Human Groups Distinguish Themselves Principally Culturally

Cultural?

Races are social categories whose members are believed to share a common "biology"

Members are believed to share features or character traits due to a unique common ancestry

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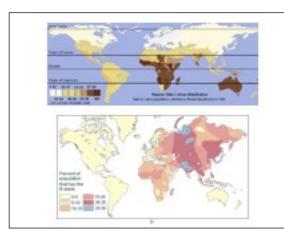
FAHV 2:

Human Biological Variation is continuous, not discrete.

FAHV 7:

People are similar to those nearby and different from those far away

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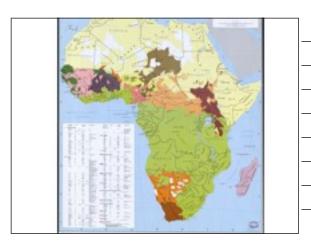
FAHV 4:

Populations are biologically real, not races

FAHV 5:

Populations also have a constructed component

,



FAHV 3:

Clustering populations is arbitrary

FAHV 8:

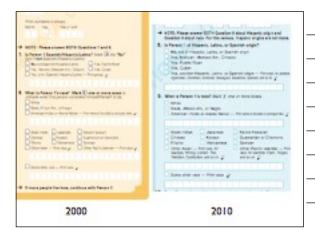
Racial classification is historical and political, and does not reflect natural biological patterns

10

FAHV 10:

Racial issues are socialpolitical-economic, not biological

16



British Census Form

- White
 - · British, Irish, other
- Mixor
- White and Black Caribbean
- White and Black African
- White and Asian
- Other Mixed
- · Asian or Asian British
 - Indian, Pakistani, Bangladeshi
 - Other
- Black or Black British
- Caribbean, African, other
- · Chinese or other

