Lecture 2

Part I: Evolutionary Theory and the Origins of Conflict

Part II: Culture Exists and Evolves

Part I: Evolutionary Theory

Assumptions of Evolutionary Theory

- Natural selection has shaped both physical and behavioral traits among *all* species, including humans.

- Individual organisms that make the best "decisions" will be the most fit (e.g., have more successful offspring).

- Evolutionary theory focuses on adaptive behavior, thus evolutionary theories view most behavior as normal rather than abnormal behavior.

Darwin's observations

1. All individuals of a particular species show variation in their behavioral, morphological and physiological traits – that is, in their phenotype.

Darwin's observations

2. A part of this variation between individuals is heritable – that is, some of that variation will be passed on from one generation to the next. Or, offspring will resemble their parents more than other individuals in the population.

Darwin's observations

3. There is competition between individuals for scarce resources (food, mates, places to sleep, etc…). Some variants are more successful than others in acquiring critical resources.

Natural selection

- Thus, traits that confer advantages to an individual in survival and reproduction will increase in frequency in a population, and those that are disadvantageous will disappear over time
- Over time this process (through very small steps) can lead to complex adaptations
- This counters what was a long held view that species and traits arise suddenly.

In Summary: Natural Selection

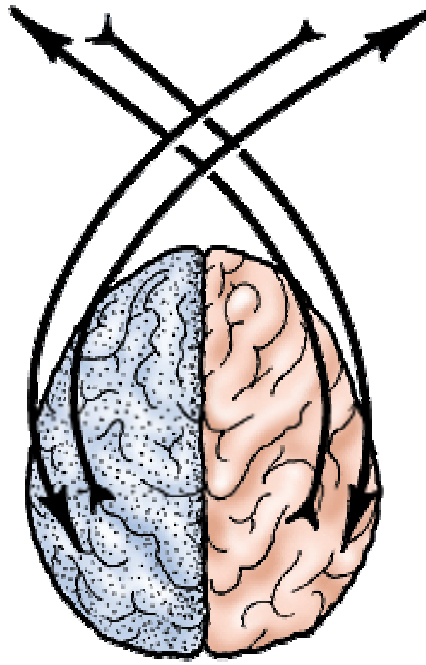
- Competition occurs because more offspring produced than resources to support them

- Heritable variation exists among individuals.

- Those with “favorable” traits will survive and reproduce, thus such traits will be disproportionately represented in future generations.

Natural Selection and Human Psychology

- Through process of natural selection, individuals with the best decision-making capacity will have more successful offspring. This capacity likely partially heritable.
- Evolutionary theory is similar to cost/benefit decision theory. It states that individuals make rational decisions (with regards to fitness) because evolution has created the *organic ability* to do this.



Kin Selection

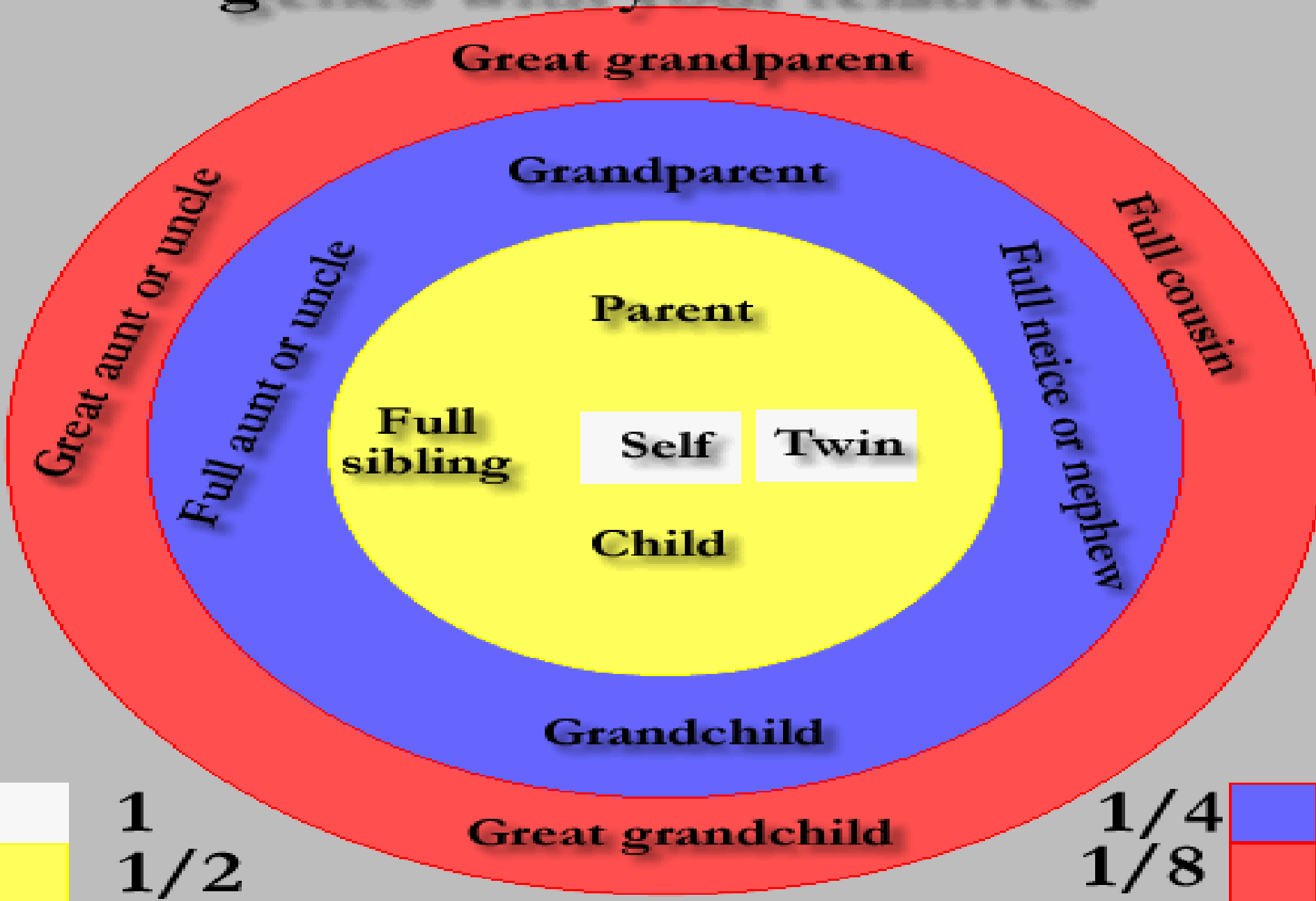
- J.B.S. Haldane said he: “would sacrifice himself for three brothers or nine cousins.

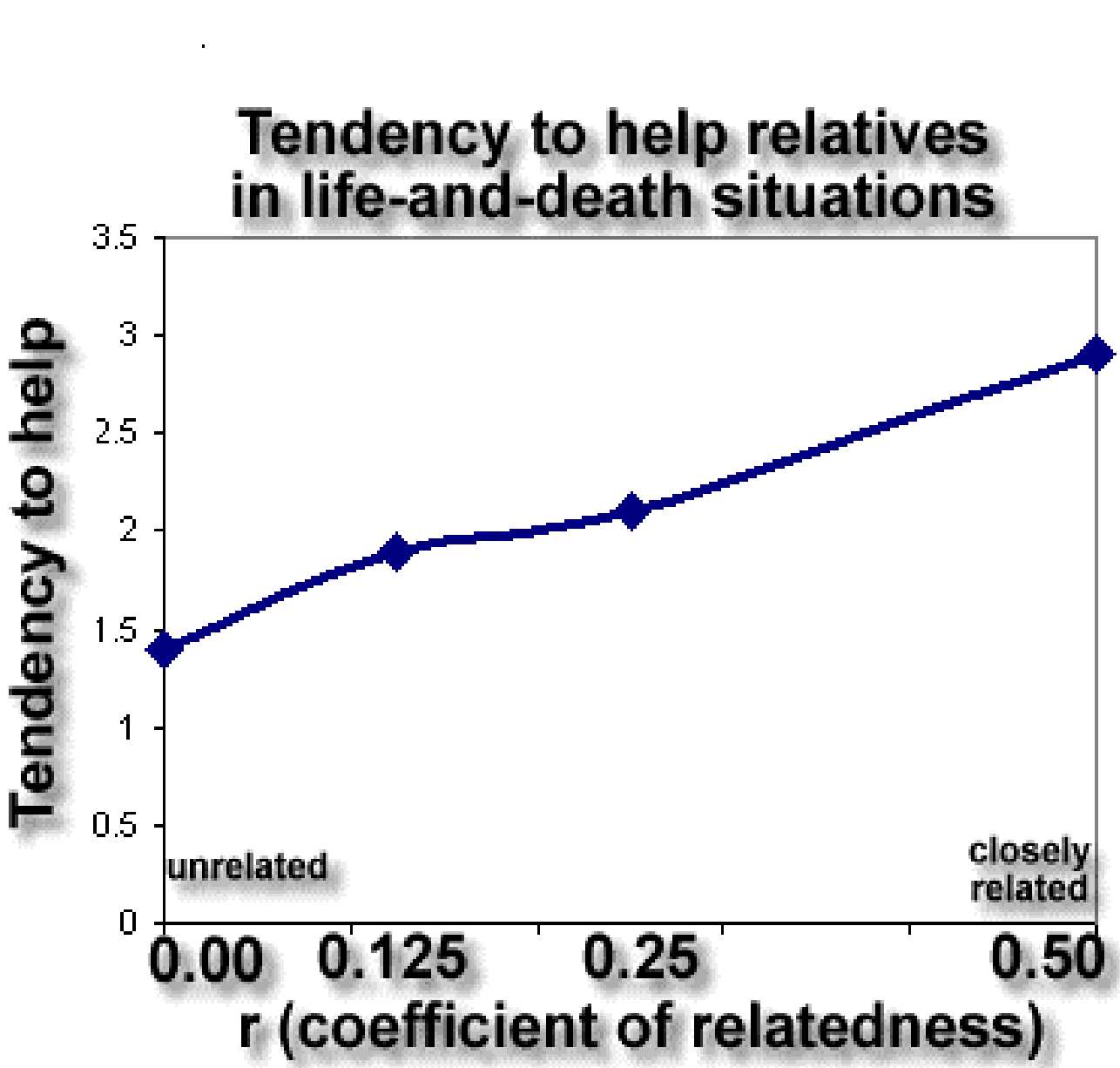
- **Benefits/Costs > 1/degree relationship**.

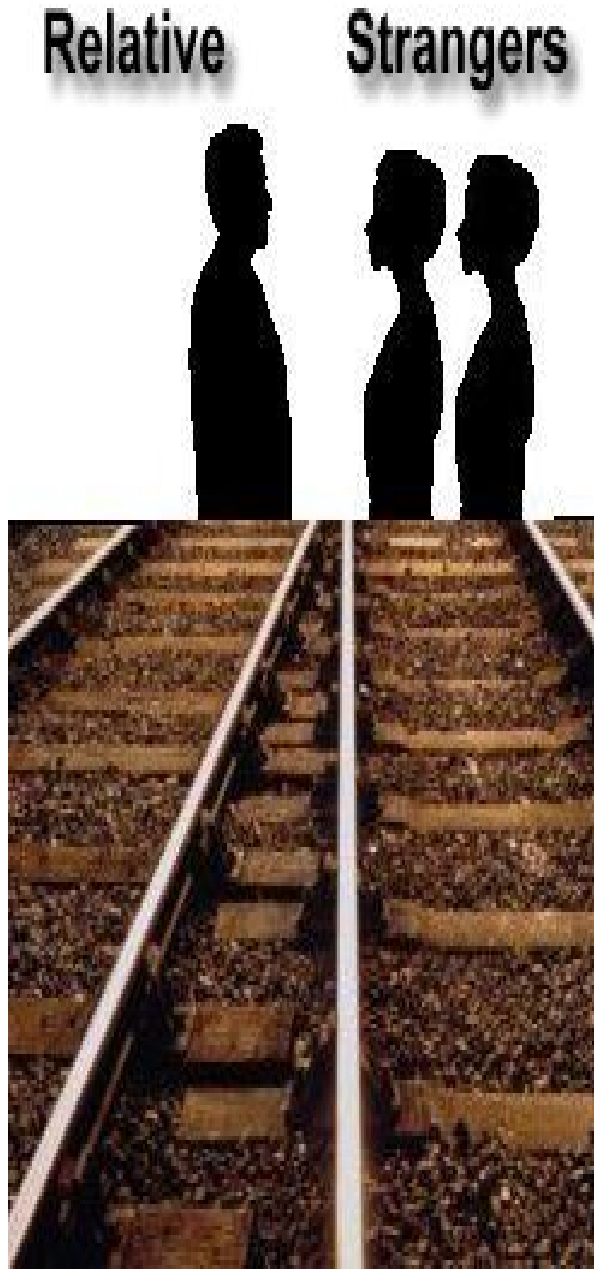
Example: Do I help my sister get a date?

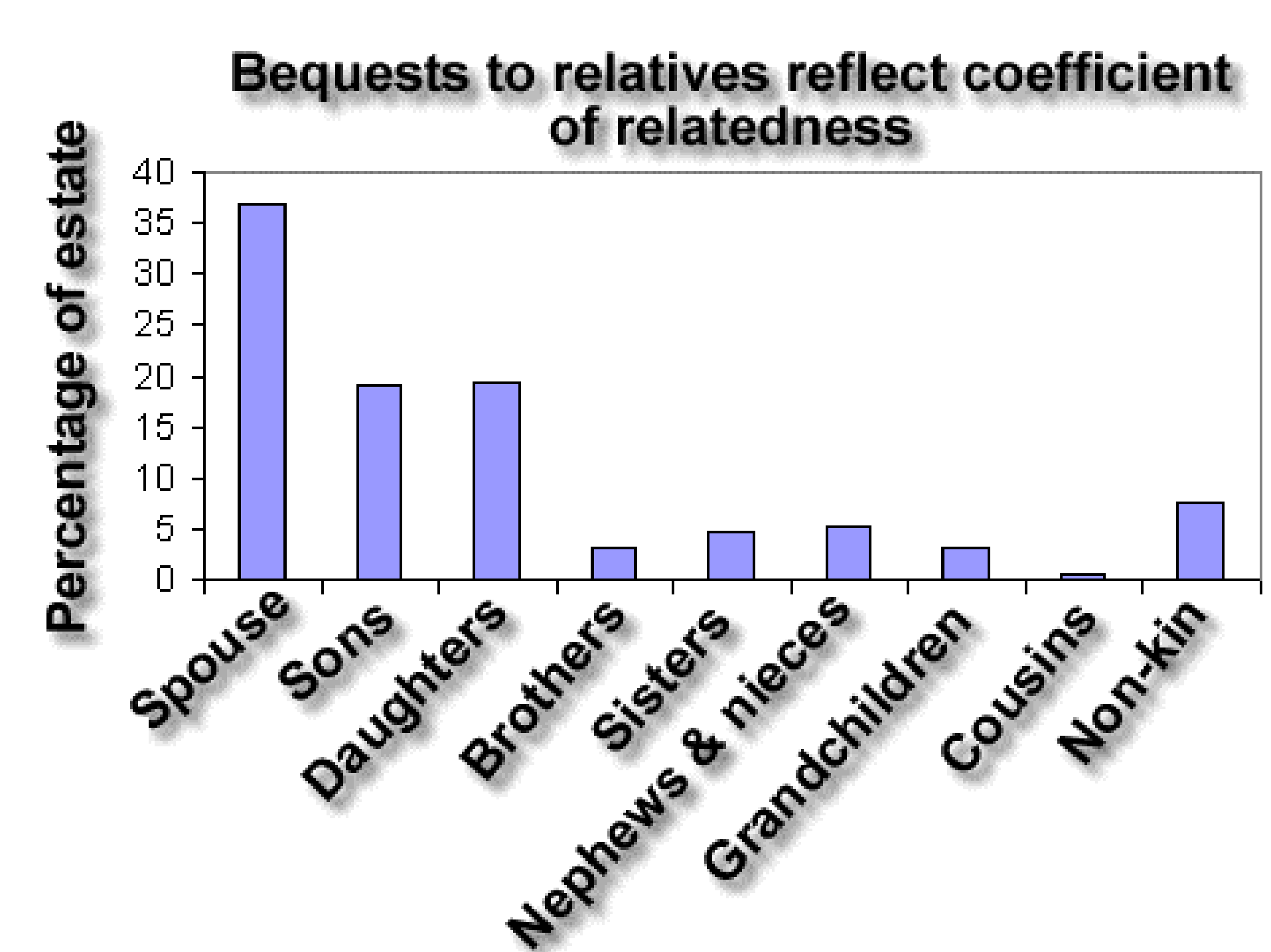
one husband / 1,000 dollars > 1/.5 [2]

You share a proportion of your genes with your relatives




Tendency to help relatives in life-and-death situations
Tendency to help
3.5
3
2.5
2
1.5
1
0.5
0
unrelated
closely related
0.00
0.125
0.25
0.50
r (coefficient of relatedness)


Relative
Strangers


Bequests to relatives reflect coefficient of relatedness
Percentage of estate
40
35
30
25
20
15
10
5
0
Spouse
Sons
Daughters
Brothers
Sisters
Nephews & nieces
Grandchildren
Cousins
Non-kin

Kin Selection

- Natural selection produces “organic mechanisms” that results in *less conflict* and *more cooperation* between close genetic relatives.

- Logic: You can pass on your genes either through your own children, or your through your cousins, siblings, and other relatives.

Kin Selection and Homicide

- As a result of kin selection, individuals should:

1.) Be *less* likely to kill their own children and related family members than non-relatives.

2.) Be more likely to cooperate when competing against non-relatives.

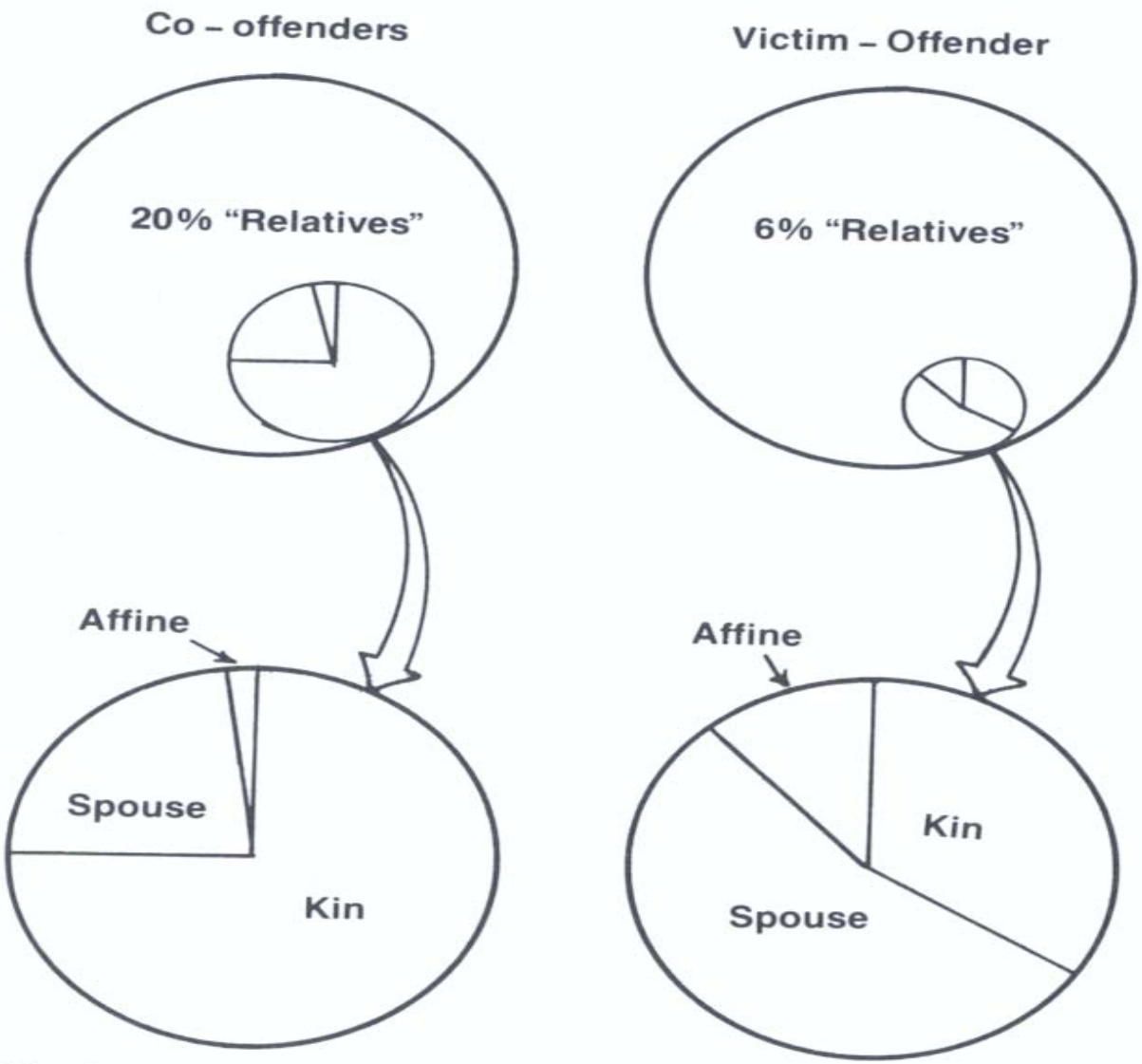
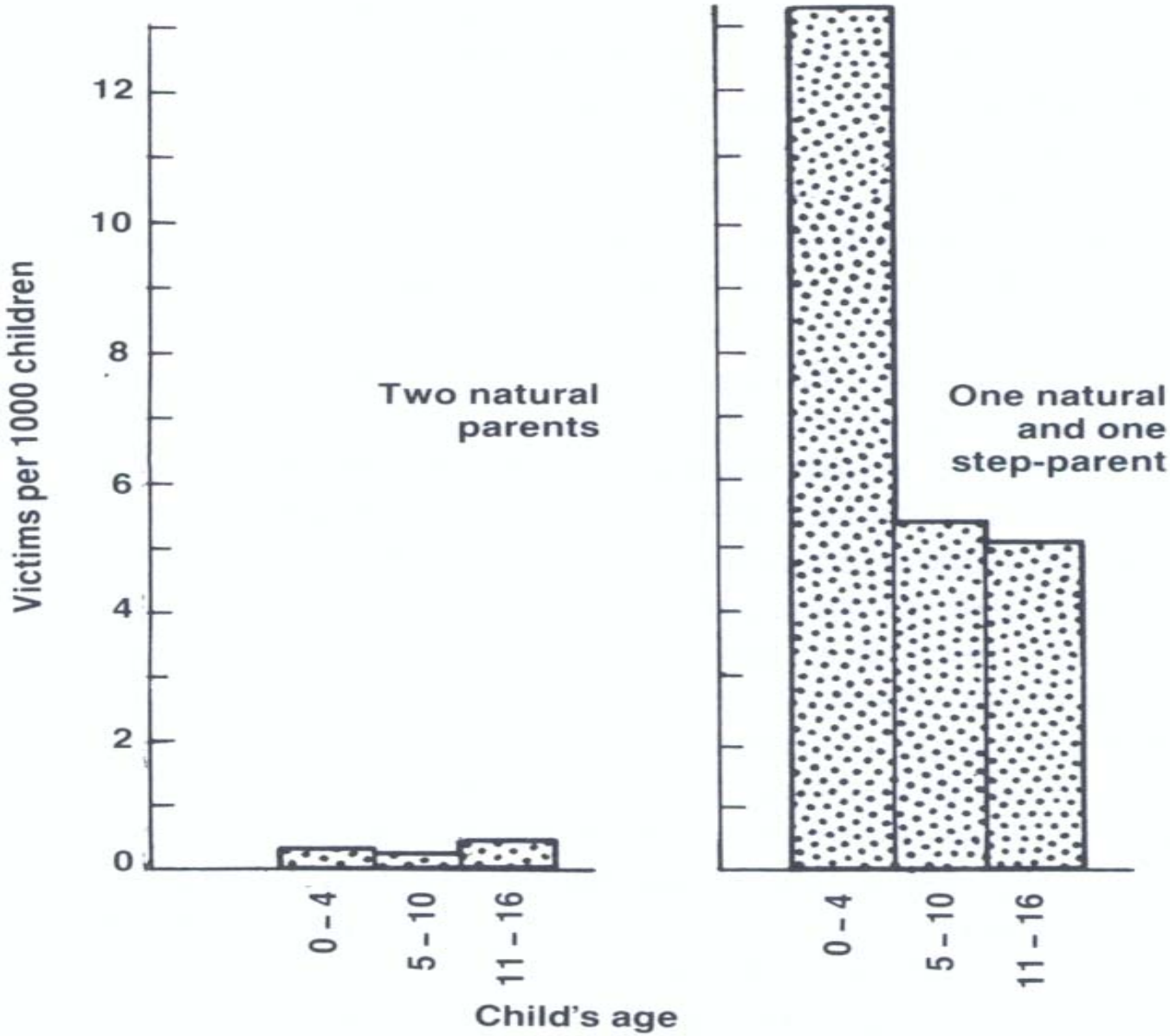


Figure 2.1. Kinship and homicidal conflict in 13th-century England. 2434 homicides form the data base. (After Given, 1977, Tables 5, 6, and 21.)

Table 2.2. Estimated Average Relatedness of Victim-and-Offender versus Co-offenders[a]

	Relationship			
	Victim-offender		Co-offender	
	r	(*N*)	*r*	(*N*)
Detroit	.03	(508)	.09	(43)
Miami	.01	(494)	.09	(27)
Bison-Horn Maria	.09	(130)	.16	(17)
Bhil	.05	(100)	.27	(22)
Munda	.07	(47)	.33	(9)
Oraon	.06	(43)	.23	(7)
Tzeltal Mayans	.08	(26)	.35	(6)
Gros Ventre	.01	(14)	.50	(1)
13th-Century England	.01	(2434)	.08	(2372)

[a]The Bhil (V... 1978), Munda, and Oraon (Saran, 1974) are all "aboriginals"



gure 4.8. Per capita rates of child abuse cases known to children's aid societies and reported to a provincial registry. Hamilton, Ontario, Canada, 1983. (Modified from Daly & Wilson, 1985.)

Part II: Predictions from Evolutionary Theory

- Numerous predictions emerge from evolutionary theory.
- We will start with a few general predictions.

1.) Self-interest

The most broad prediction of evolutionary theory is that we should expect organisms to be “concerned” or motivated to protect their own “inclusive fitness”. This means organisms will often make choices that is best for themselves and their genetic kin.

1.) Self-interest cont.

- For people to achieve their reproductive goals, they need to obtain resources, obtain mates, and raise their young.
- It is pretty easy to see how if everybody is trying their best to “get more” for their family, then people will come into conflict.

2.) Kin Selection

- We expect more cooperation (and less conflict) among close kin.

- Thus, we should not be surprised when non-kin come into conflict; the evolutionary perspective predicts that individuals will look after their own interests.

Part II: Culture Exists

In the next sections, we will focus on culture. Culture is generally unique to humans, and no theory of human behavior is complete without attention to culture.

We will begin a discussion about an evolutionary theory of culture.

Important Points

- 1.) Useful to partition sources of variation
- 2.) Why distinguish culture from environment?
- 3.) Some behavioral variation within groups is due to genetic differences
- 4.) Genetic variation within populations does not imply variation between populations is also genetic

A Discussion About Culture

- Do you think culture exists?
- Do you think culture is important?
- How does culture influence behavior?

The “Standard Social Science Model”

- Psychic unity of humankind
  ⇒No important genetic difference between groups
- Human mind lacks content based innate mechanisms
  ⇒ vast differences between people come from external sources
- External sources are mainly the social environment
  ⇒Society creates the individual
  ⇒Complex structure of human cultures comes from emergent social interactions
  ⇒Biology plays no important role

1.) Useful to partition sources of variation

- Genetic Variation = Differences between people because they inherit different genes from their parents.
- Environmental Variation = Differences between people because they live in different environments
- Cultural Variation = Differences between people because they have acquired different beliefs or values by teaching or imitation

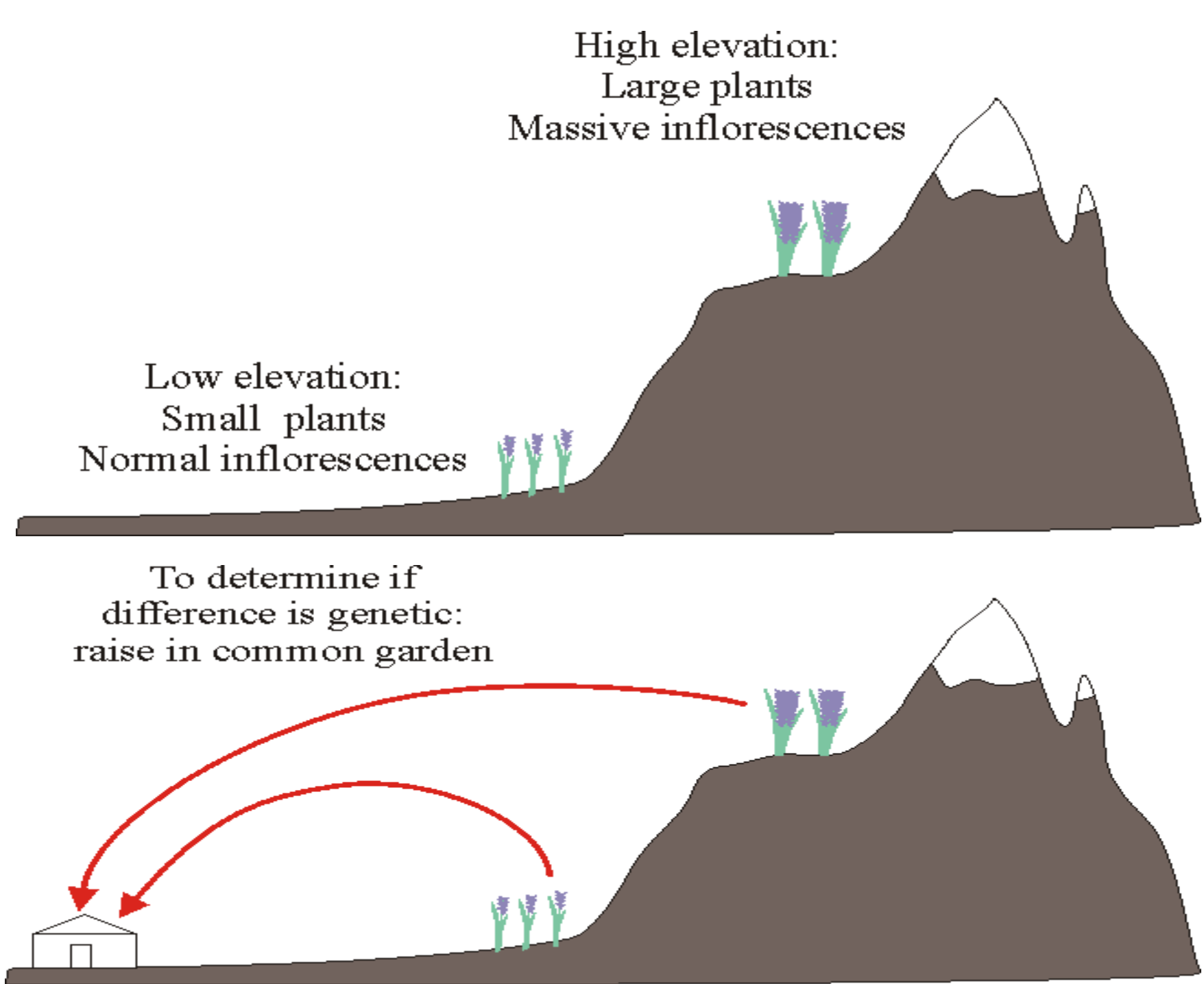
2.) Why distinguish culture from environment?

- **Culture is information acquired by imitation, teaching and other forms of social learning**

$\Rightarrow$Cultural information is stored in a population of brains and transmitted through time

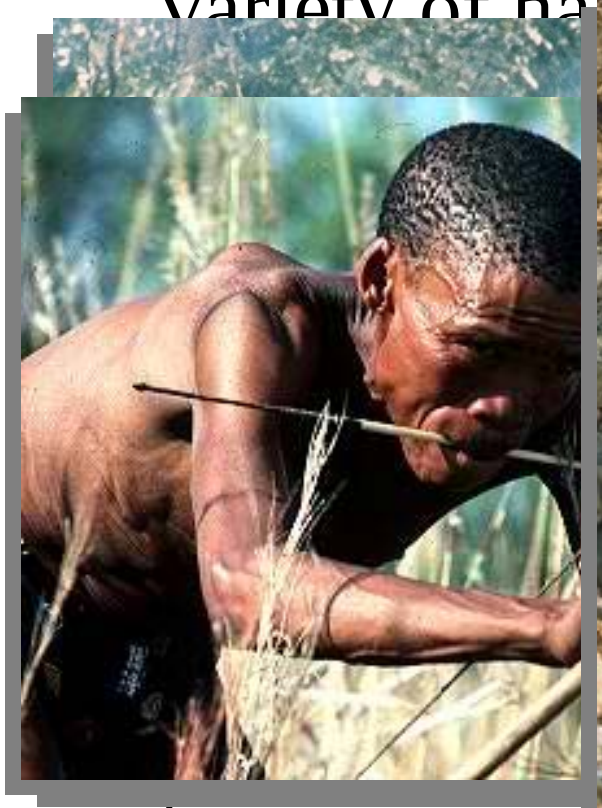
$\Rightarrow$Causal processes that affect culture different from other dimensions of the environment.

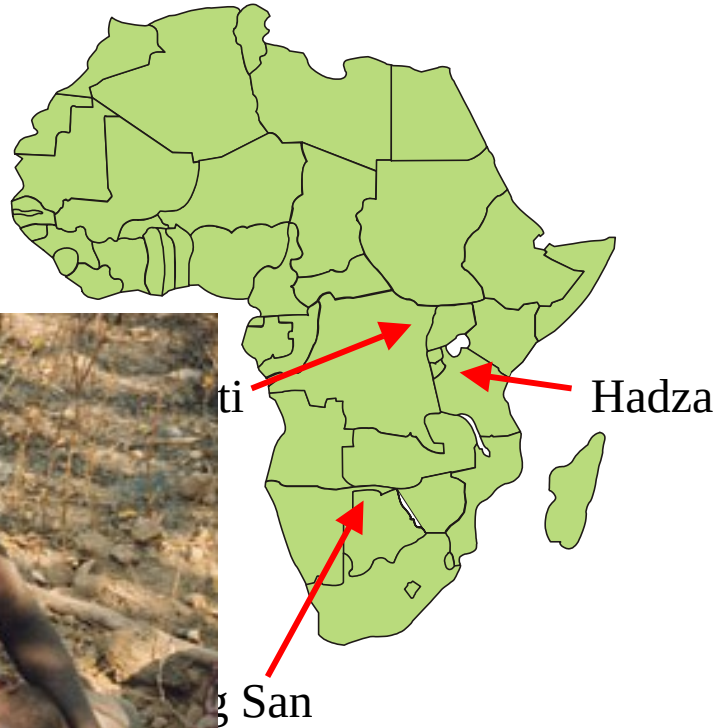
Biologists use “Common Garden” experiment to determine if observed differences are genetic or environmental


High elevation:
Large plants
Massive inflorescences
Low elevation:
Small plants
Normal inflorescences
To determine if
difference is genetic:
raise in common garden

Imagine a common garden for human foragers

- Foragers live in a variety of ha





Observations of immigrant groups in Illinois approximate common garden experiment

- Sonya Salamon studied farming communities in Illinois settled in mid 1800's by immigrants from different regions
  - Germans (2 communities, Westfalian Catholics, Friesian Protestants)
  - Irish
  - Swedish
  - Yankees (2 communities, mainly from Ohio an mid-Atlantic states)
- Carefully matched for soil type and other factors that effect farming practices
- Collected data on farming behavior, land tenure, inheritance practices
- Did in depth interviews in subset of each community
- **Here I focus on German-Yankee contrast**

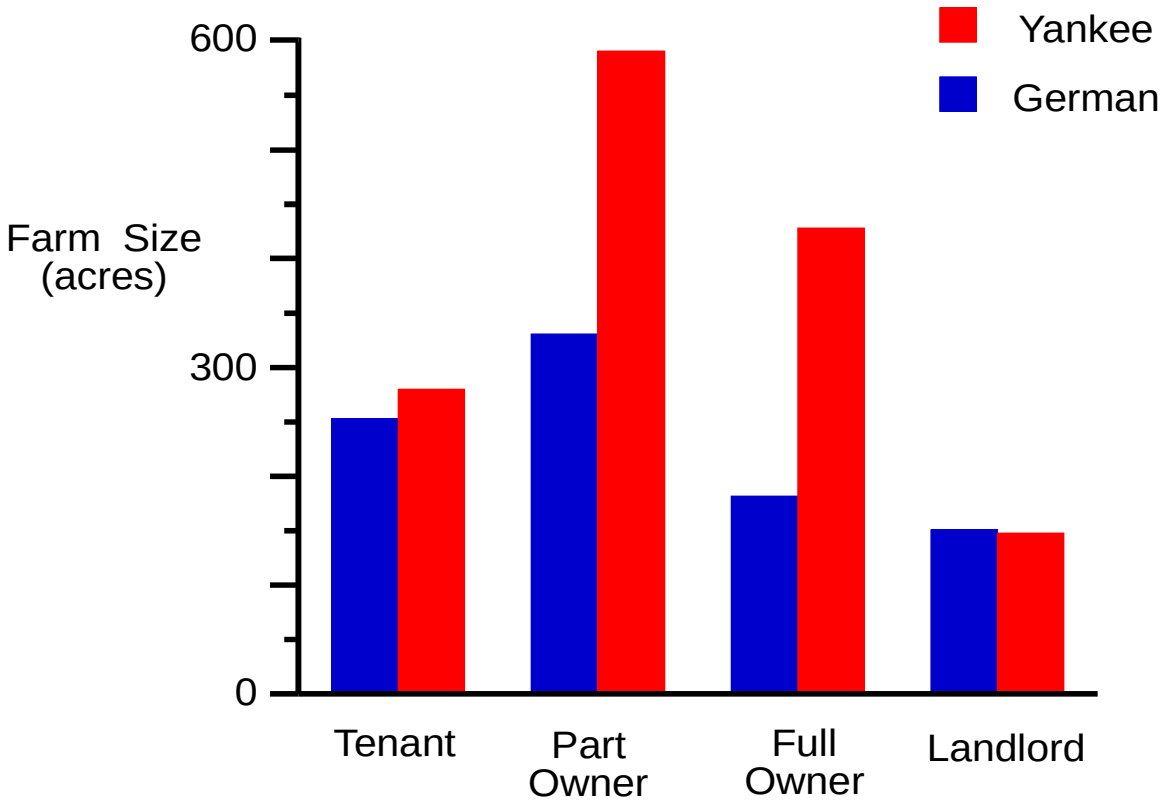
Yankees express “entrepreneurial” values

- Farming is a business
- Goal: make money
- Place a high value on education
- Don’t pressure children to go into farming

Germans express “yeoman” values

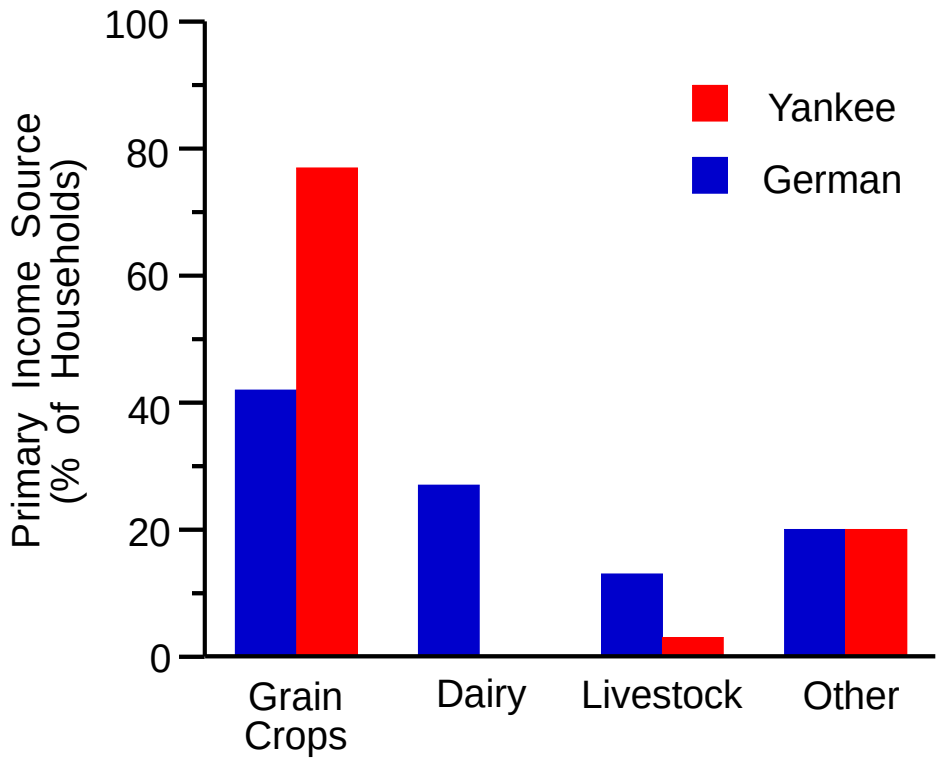
- Farming is a valuable way of life
- Goal: keep farm in the family
- Don’t place a high value on education
- Urge children to go into farming

Germans rent less land and maintain smaller farms



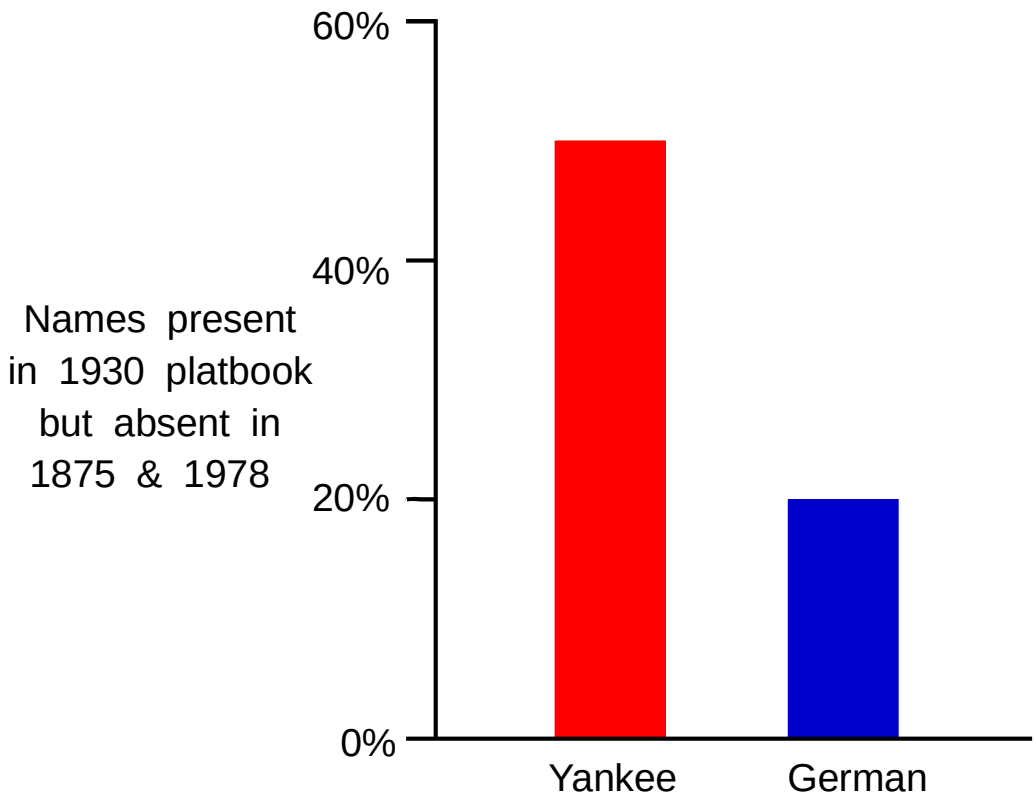
From: Salomon 1985

Germans operate their farms differently than Yankees



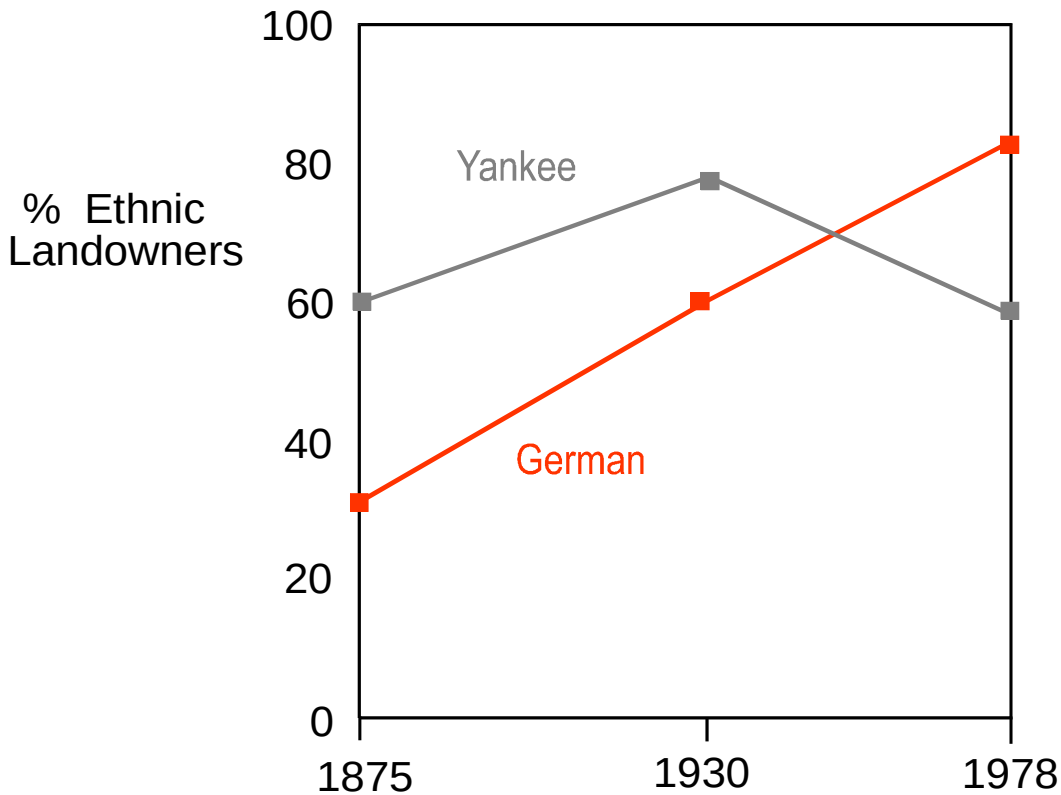
From: Salamon 1985

Germans buy and sell land less often than Yankees



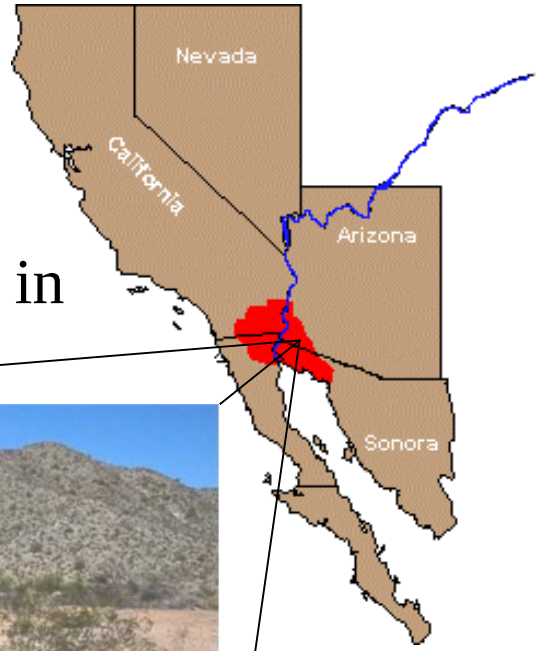
From: Salamon 1985

German are replacing Yankees



From: Salamon 1985

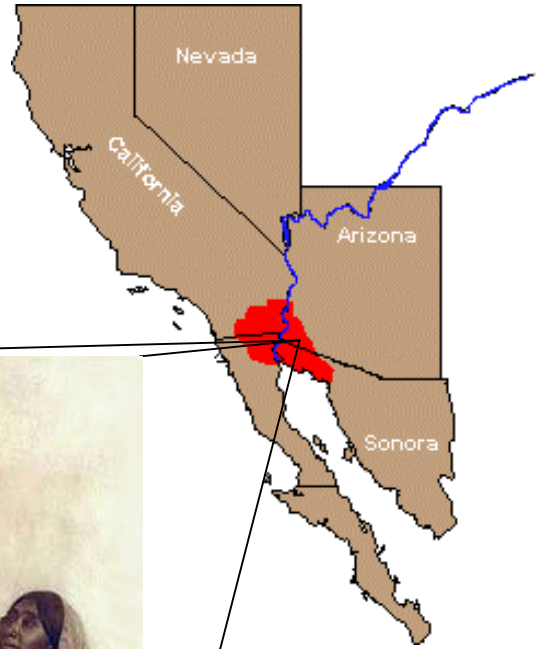
A thought experiment:



- Your task is to survive and raise your kids in the Colorado Desert of the American Southwest.
  - You get 6 months of supplies—a little time to see what comes naturally.
  - Then, I take away all industrialized products.
  - Will you make it??

- I don't like your chances...
  - This area was the best route from Mexico to California before the railroads.
  - It was called *El Camino del Diablo*, and many tough, desert wise pioneers died trying to make the trip.

The Tohono O'odham lived where pioneers perished.



- With a few pounds of wood, stone and bone equipment, and a store of adaptive information.
  - Semi-nomadic, band social organization.
  - Foraging + rainfall horticulture.
  - Specialized technology
  - Extensive knowledge of desert.

⇒ People have psychological mechanisms that allowed Tohono O'odham to acquire information necessary to flourish in Colorado Desert, but

⇒ Information itself is not contained in genetically transmitted modules.

3.) Some behavioral variation within groups is due to genetic differences

- Familial correlations are high for a variety of behavioral characters
  - IQ
  - Social attitudes
  - Religiosity
- Behavior genetic studies indicate that most of this variation is due to genes not common family environment
  - Twin studies: MZ twins much more similar than DZ twins
  - Family studies: statistical analysis of larger families indicates little effect of common family environment
- Strong effects of extra-familial environment

4.) Genetic variation within populations does not imply variation between populations is also genetic

- Genetic variation within populations $\Rightarrow$

  genetic differences between individuals >>
  environmental differences

- Genetic variation among population $\Rightarrow$

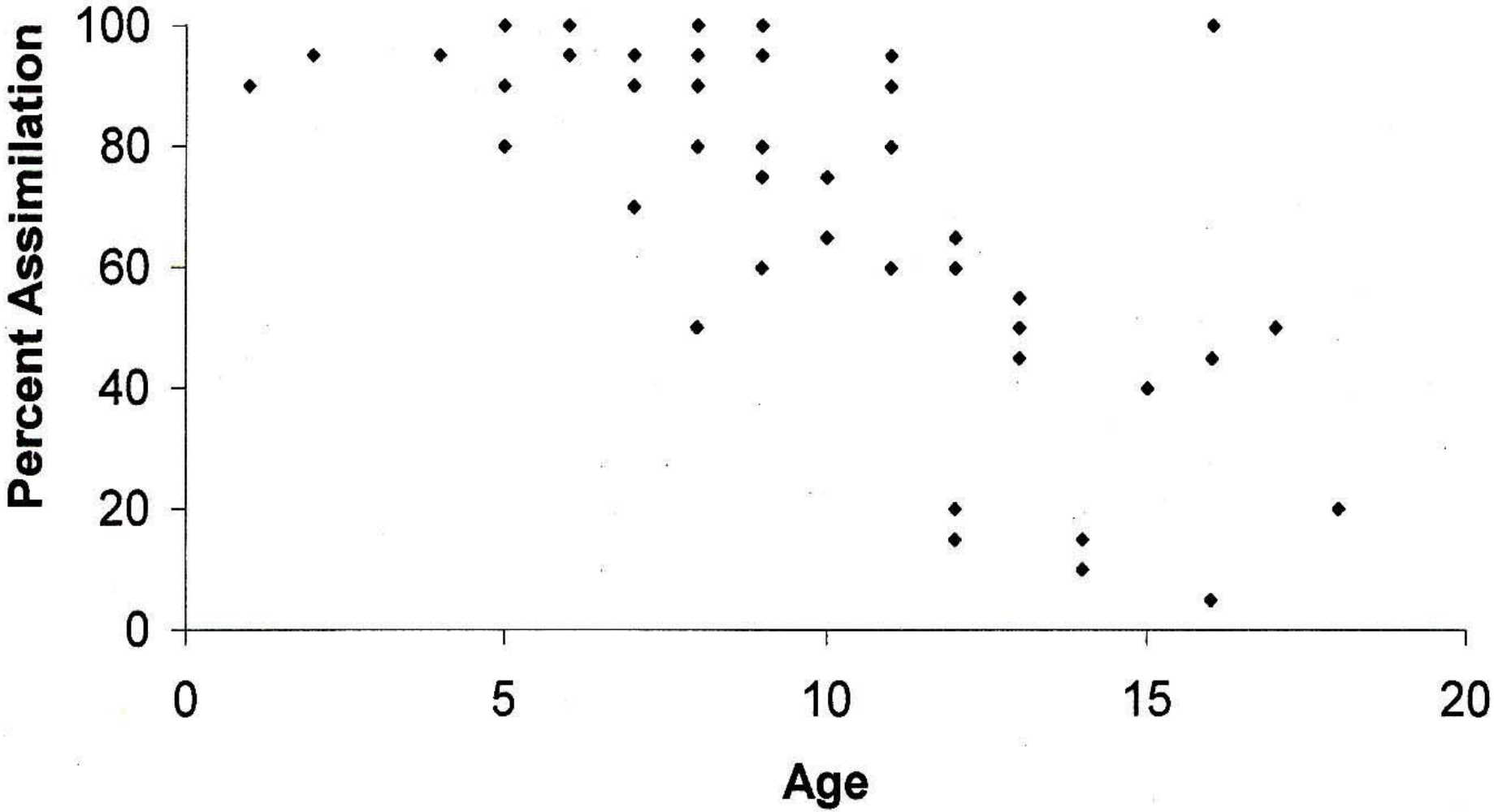
  average genetic differences between populations >>
  environmental differences

- The magnitude of genetic differences among individuals does not tell us anything about the average differences between groups!!!

Cross-cultural adoptees behave according to adopted not natal culture

- If differences between cultures were genetic, cross-cultural adoptees would resemble the people in their natal culture in important ways.
- No evidence for this
  - Louis Lyden's study of 101 Korean adoptees in US families
  - Norman Herd study of "white" children raised in Indian communities

Adoption of White Children by Indians



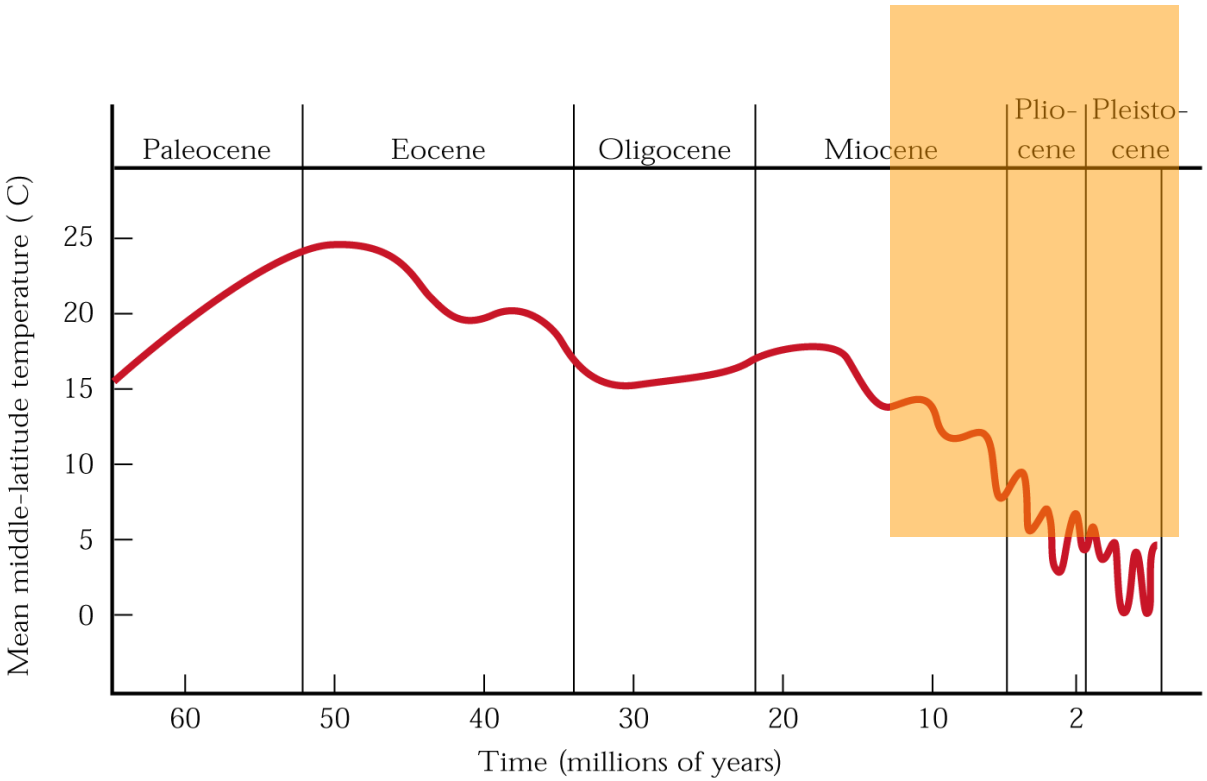
Part III: Culture Evolves

- Although, the details are not important to us here, it is important to consider that “cultural traits” (like genes) can be tracked at the population level.
- At Time 1, most people in a population have a taboo against not eating meat. At time 2, most people in the population have a taboo about not eating vegetables.
- What happened? There was a change in cultural variants, or cultural evolution!

Culture Is an Adaptation

- The human capacity for culture is an evolved adaptation.
- Why do you think humans learn socially and transmit information through culture?

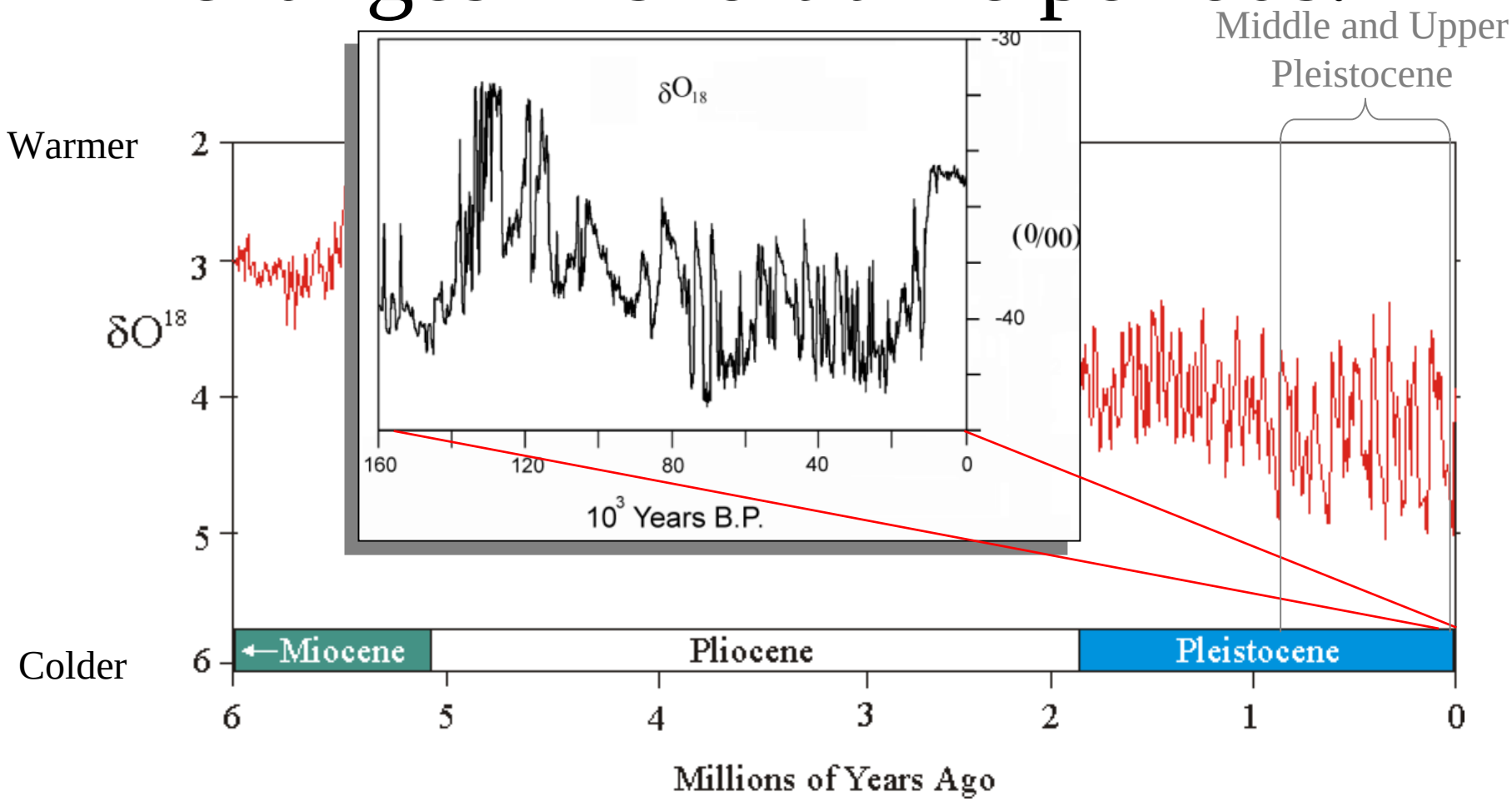
The world's climate has become colder and more variable



18–2 mya

- Cooler and drier
- Spread of grasslands

Pleistocene climates show large changes in short time periods.



(Redrawn from Opdyke 1995 & GRIP 1993)

Genes and Culture Coevolve

Cultural group selection leads to tribal social instincts

Gene-culture Co-evolution

- **This process, often referred to as gene-culture co-evolution, involves rapid changes in the human gene pool as a result of rapid cultural changes.**
- **In general, culture creates a new environment in which the genes pool then become adapted to.**

Herding and Lactose Tolerance

- **In the past, some human populations herded animals and drank their milk (a economic practice sustained by the cultural knowledge of herding).**
- **In a short period of time from a genetic evolutionary perspective, these populations became genetically “adapted” to their own cultural environment (herding) with genes that facilitated lactose tolerance.**

Human docility: A Product of Group Selection?

Baum 1994: *Understanding Behaviorism*

Humans are unusually sensitive to social reinforcement, WHY?

Vicki:

Chimpanzee with human

Friend & "parent"

Summary

- I talked about culture, and cultural evolution because culture is almost always a central force that influences human behavior.
- When we talk about theories of social conflict, as well as institutions to resolve conflict, culture will be a central variable to consider.

Summary

- Culture is “information” stored in the brains of a population of individuals.
- Like genetic evolution, there are also cultural evolutionary processes.
- **The take home message: An evolutionary theory of human conflict and cooperation requires attention to both genes and culture.**