

Biosocial interactions in modernization


7. Social variation and socialism

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➤ 7.1. Evolutionary background of social variation

➤ 7.2. Meritocracy and socialism in modern society

Social and biological variation

- Human societies:
 - **differences** in wealth, power or prestige;
 - different positions and functions are differentially **evaluated**.
- Modern societies:
 - hierarchy of the functionally necessary social activities increasingly determined by the degree of **knowledge and responsibility**;
 - require the presence of a particular biological (physical as well as mental) **endowment and equipment** of the individual.
- Sociobiological question:
- **BIOLOGICAL VARIATION**  **SOCIAL DIFFERENTIATION**

Evolutionary background of social variation

- Social status **inequalities** in human societies are in line with the **dominance hierarchies** in social animal species;
- The evolutionary background of social status differences has ultimately to do with differential reproductive fitness, with **Darwinian selection**:

- **Individual level:**

- maximization of inclusive fitness



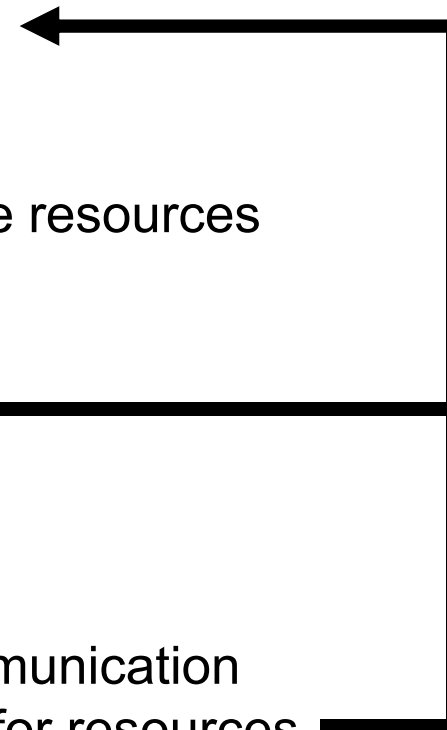
- within-group competition for scarce resources



- social hierarchies

- **Group level:**

- group stability
- favouring the transmission of communication
- inter-group conflict or competition for resources



Historical theories about bio-social inequalities

- Early writings:
 - minimum of empirical research
 - abundance of theoretical and speculative writings
- Two important events:
 - Darwinism: major catalyst
 - Marxism: antithesis

Three major schools of thought

- The **anthropo-sociological** school of thought (de Lapouge, 1896; Ammon, 1893):
 - conceptualised the social-biological problems of the interrelations between biological variation and social differentiation
 - empirical research;
 - lopsided hereditarian and racialist determinism
- **“Social Darwinism”** (Spencer, 1864; Sumner, 1883)
 - No empirical research
 - Economic success equalizes biological success
 - Confused social assortment with social selection
 - Individualist social-Darwinism → Collective social-Darwinism
 - ≠ ‘new’ social Darwinists
- **Marxist biological doctrine** (Marx, 1861; Engels, 1878)
 - Darwinism basis in natural selection for the class struggle
 - Rejection of population pressure as a selecting agent
 - Environmental factors as causes of social differentiation
 - Believed in Lamarckism, - the inheritance of acquired characteristics
 - → Lysenkoism

The (modern) social-biological approach of bio-social interactions

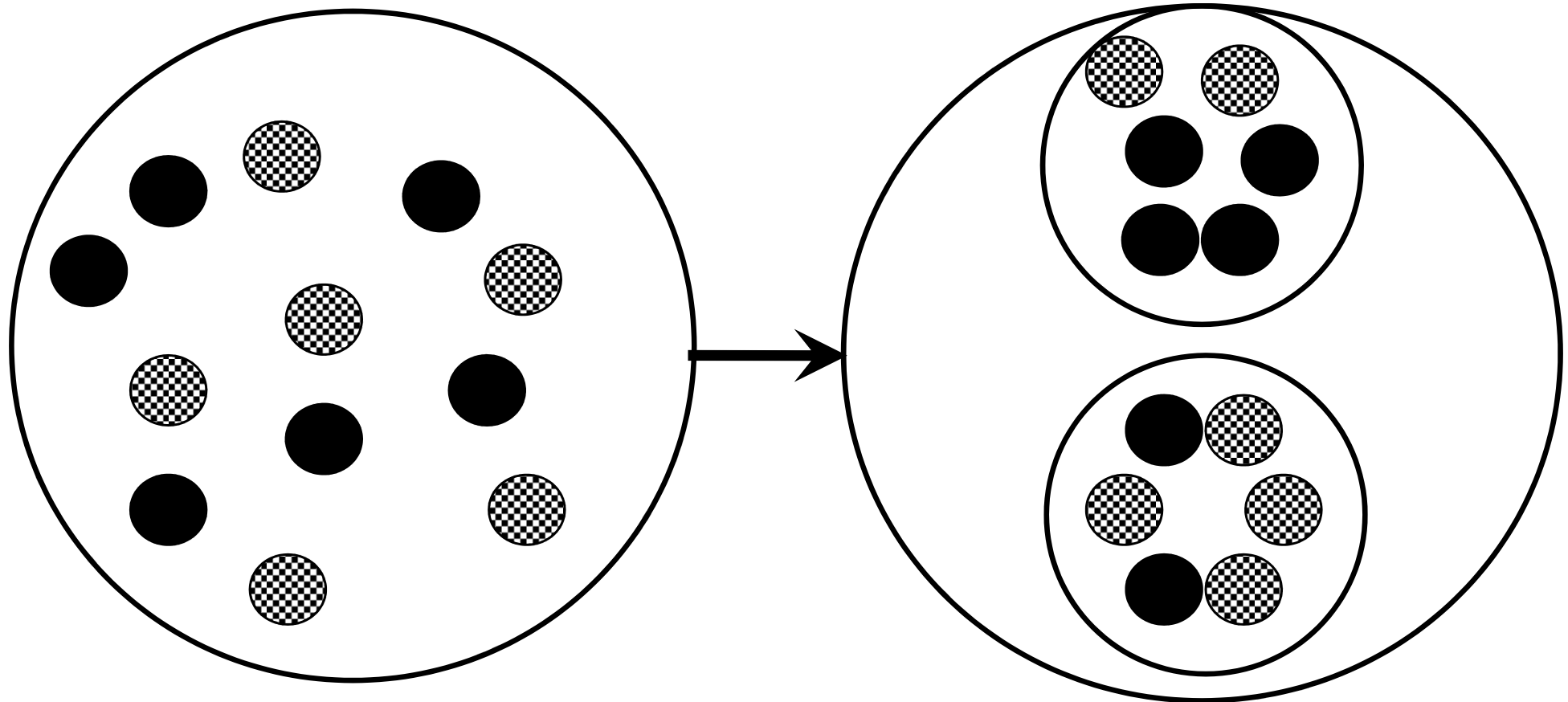
- Strongly **empirically** oriented;
- **Bi-directionally** oriented in its observation of the associations between biological variation and social differentiation
- Considers both **genetic and environmental** mechanisms of bio-social interaction:
 - Social assortment and social selection
 - Environmental influences

Social assortment and social selection

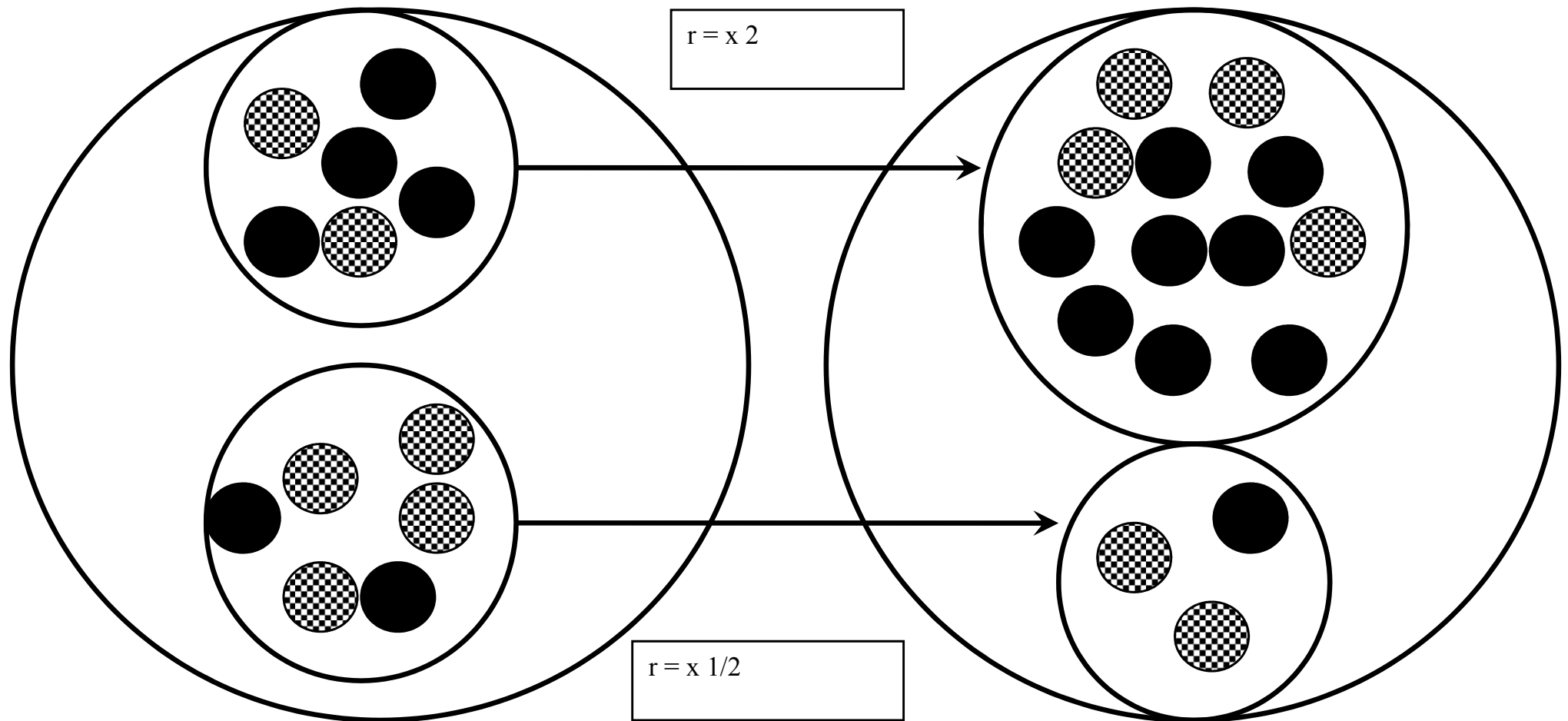
- Social assortment is the **subdivision** of a population in a number of distinguishable groups, resulting from the **non-random mobility** of individuals into those groups;
 - assortative mate choice
- Social selection: **differential reproduction** of carriers of different genetic traits under pressure of social living conditions.

BIOLOGICAL VARIATION  **SOCIAL DIFFERENTIATION**

Social assortment



Social selection



Proportion of 2 variants in the total population of the P generation: 1/1

Proportion of 2 variants in the total population of the F1 generation: 1.5/1

Environmental influences linked to social status differences

- Social assortment processes:
 - usually observed on the basis of the differential distribution of **phenotypes** over social categories;
 - Genetic effects to be evaluated on the basis of **heritability**
- Environmental factors:
 - can be produced by the **social categories**;
 - **Major factors**: maternal prenatal influences, nutrition, ecological influences, exposure to infections or other health influencing conditions, education in family and at school, influences residing in occupational activities, leisure activities and social relations

BIOLOGICAL VARIATION ← SOCIAL DIFFERENTIATION

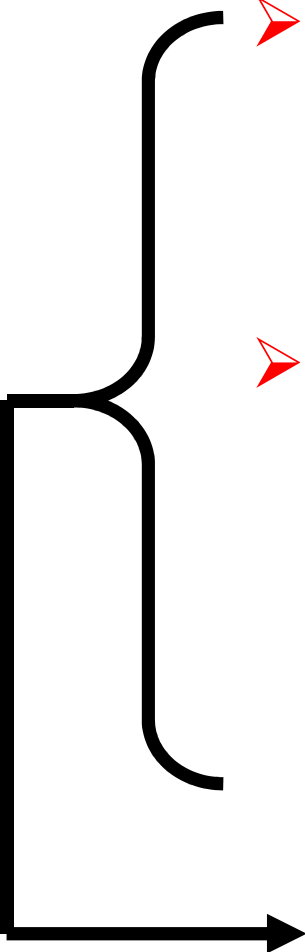
Secular trend in socially differentials in body height



Genetic-environmental covariance

- Genotypes:
 - have the tendency to **create their own environment** and, hence, produce biological differences which are due to both a genetic endowment and the specific environment that this endowment produced;
- Transgenerational effects:
 - parents may create a genotypically adapted specific environment or suppress the development of the physical or intellectual abilities of their **offspring**

Effects of social origin and social status

- 
- Biological correlates with **social origin**:
 - effects of the environment of origin;
 - can be partly due to **genetic assortment** processes in former generations.
 - Biological differentials between social origin and **social status** or aspiration level:
 - effects of genetic assortment;
 - may (partly) be due to the **parental environment** or to (cumulative) life course events individuals themselves experienced.

Beware of simplistic explanations of complex bio-social associations!

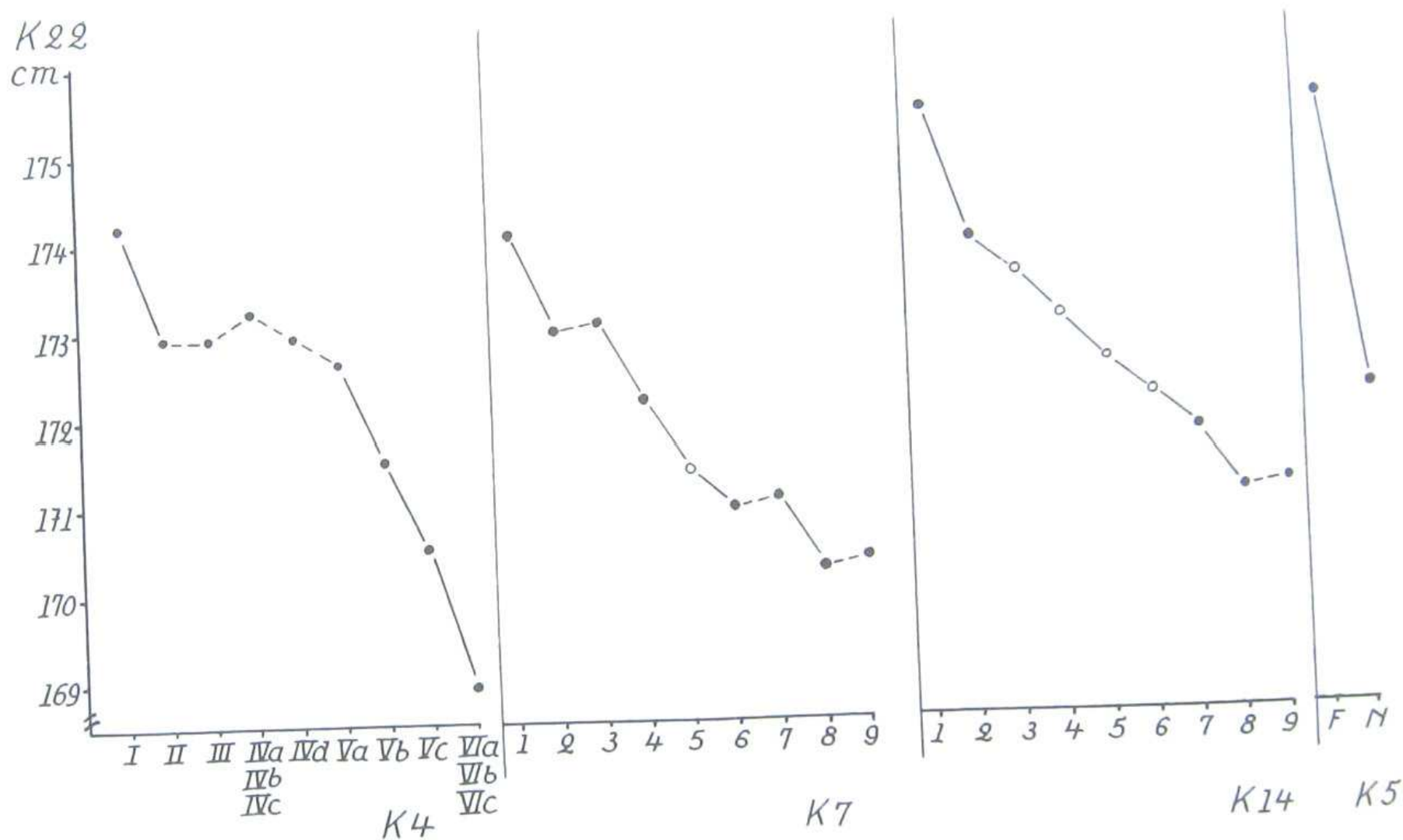
Social stratification and biological variation

- Statistically highly significant associations of varying degree:
 - **Social** (status) variables
 - socio-economic (e.g. occupation, income)
 - socio-cultural (e.g. education)
 - Various groups of **biological** characteristics
 - maturation features
 - body build characteristics
 - health characteristics
 - cognitive performance
- Substantial within-group **variation!**

Body size and body build

- Stature:
 - linear positive association with SES;
- Body weight: $r = \pm 0.50$ with body stature
 - Obesity: inversely related to SES and downward social mobility (Affluence society has apparently led to a concentration of unhealthy diets and life styles among less educated population groups).
- Muscle-bone:
 - constitutionally more slim body build among higher social strata and in particular intellectuals, whereas several biometric breadth measures are more pronounced among lower socio-economic status groups
 - effects of specific occupational assortment or influence

Social differentiation of body height



Growth and maturation

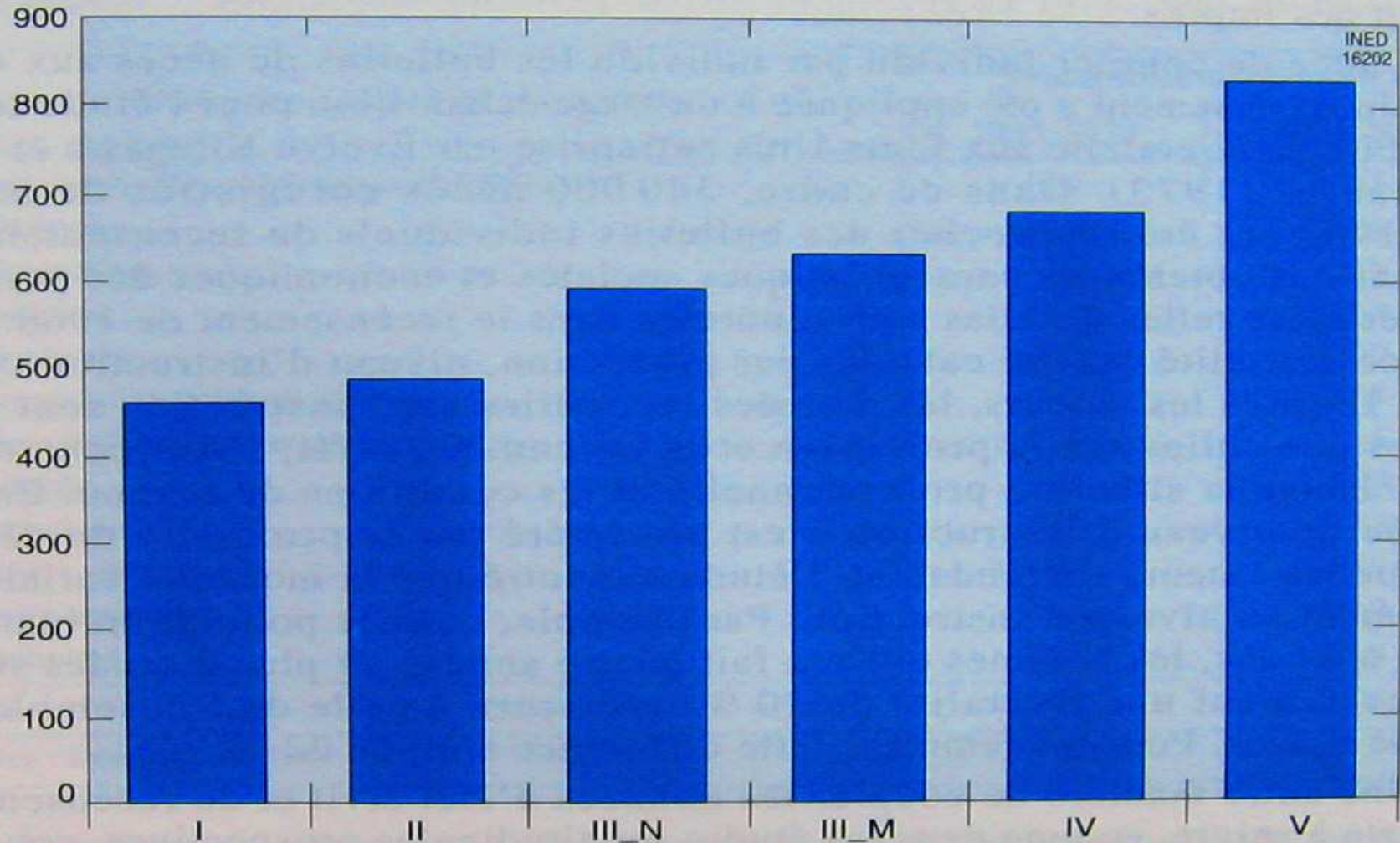
- Various biological indicators of growth and maturation related to socio-economic status differences:
 - skeletal age,
 - tooth eruption,
 - puberty measures, in particular age at menarche.
- Intergenerational changes in growth are secular trends toward greater body size and increased tempo of maturation.

Health and longevity

- Social stratification:
 - positively associated with a health stratification;
 - chronic and acute ill health - and health potentials
 - disease-specific relations: the biggest differences are found for infectious, parasitic, and respiratory diseases, while there is less or no difference for cancers and circulatory diseases
 - Mortality differentials!
 - in recent decades, the differences between the extreme categories of the social stratification tend even to increase

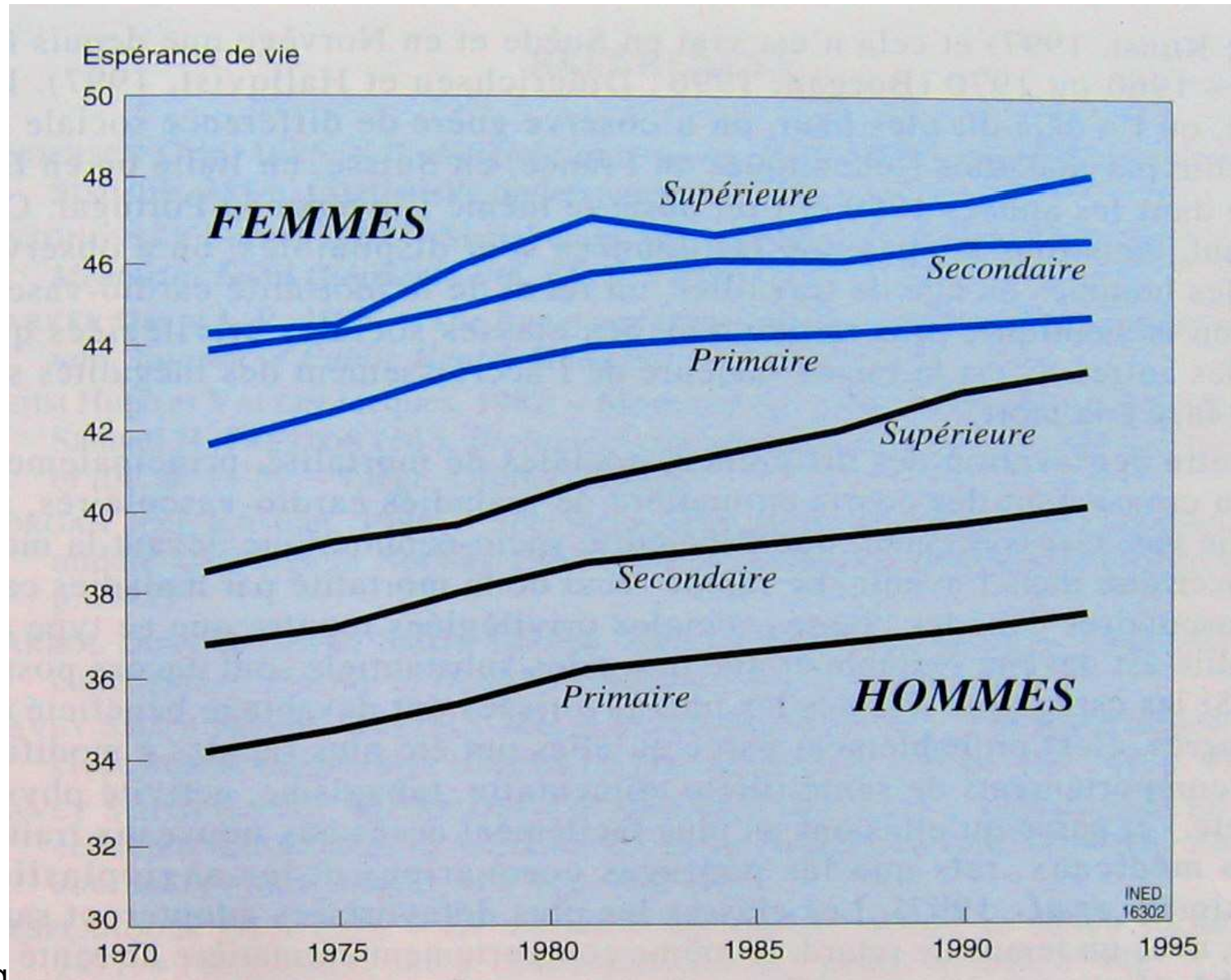
Socially differential mortality

Taux de mortalité (p. 100 000)



I : Professional. II : Managerial and technical. III_N : Skilled (non-manual).
III_M : Skilled (manual). IV : Partly skilled. V : Unskilled

Recent trends in socially differentiated longevity



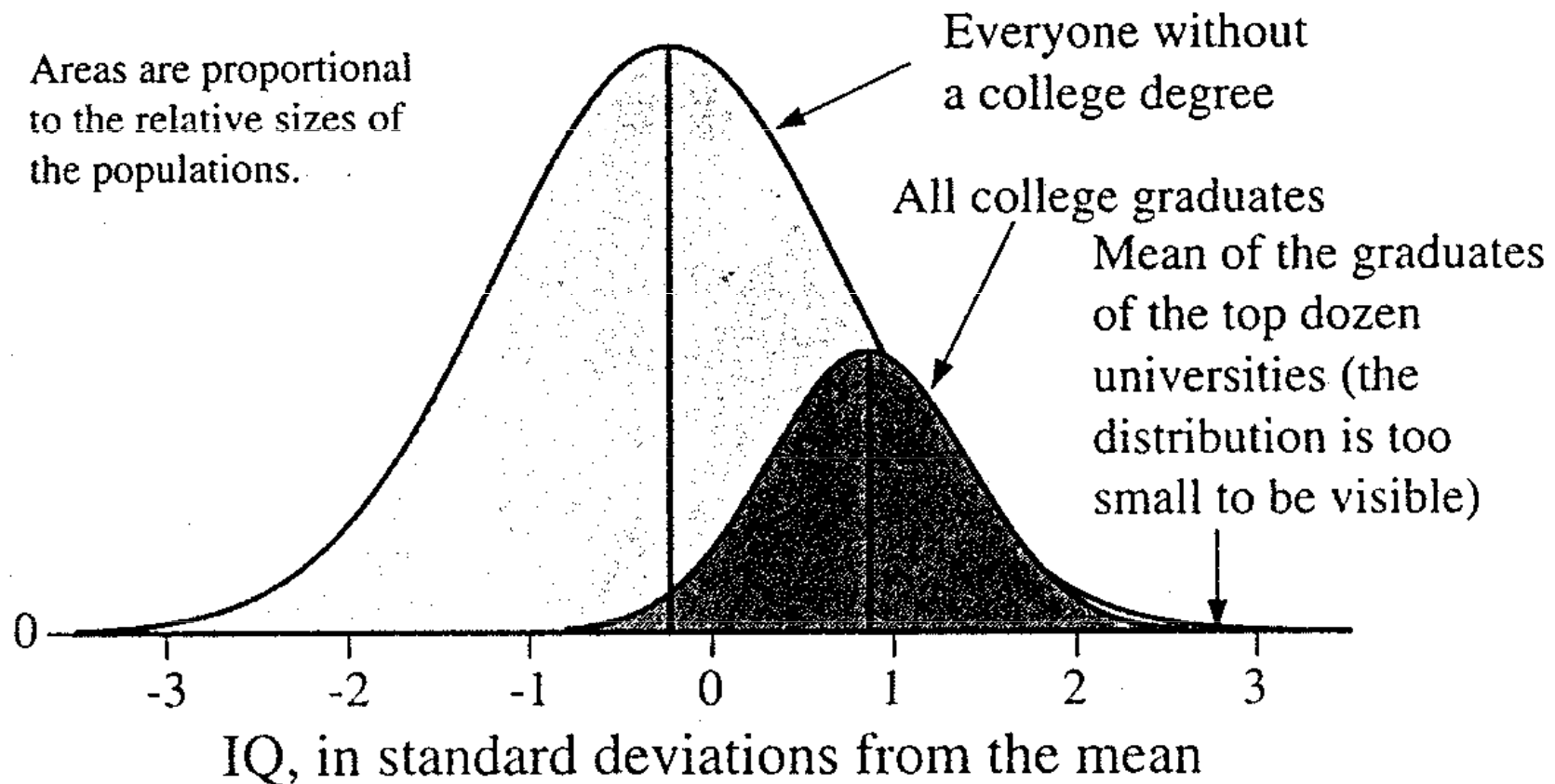
Measured intelligence

- highest correlation coefficients with measures of social status:
 - parents' social status and children's IQ:
 $r = 0.30$ to 0.40 ;
 - persons' IQs and their own attained SES:
 $r = 0.50$ to 0.70 .

IQ distribution and educational level in US

Americans with and without a college degree as of 1990

Three Populations of 23-Year-Olds in 1990



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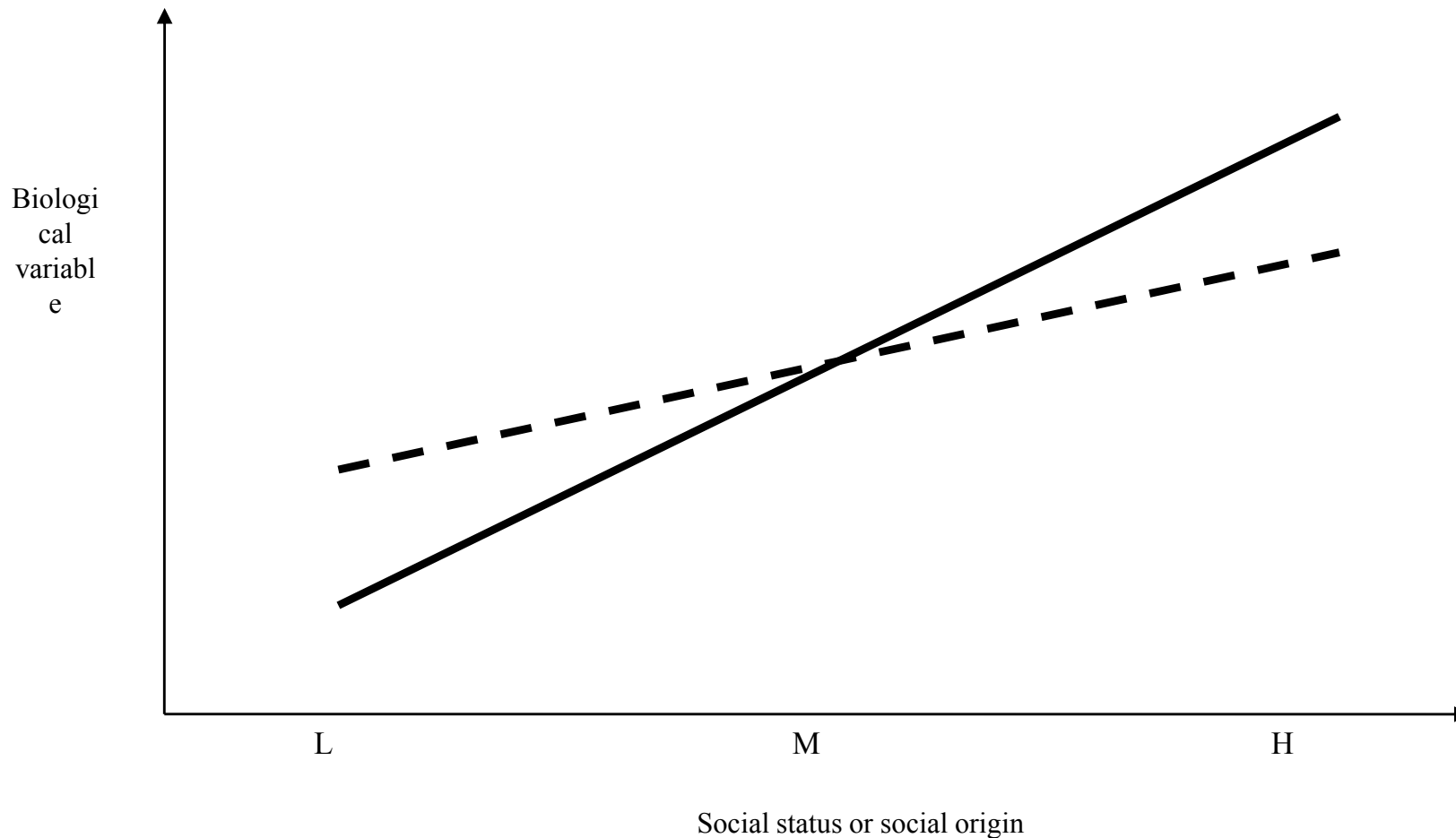
Causes of interrelations between biological variation and social stratification

- **Environmental** influences
 - Biological factors, such as prenatal influences, nutrition, birth order;
 - Structural factors, i.e. differential access to institutional means for achieving prescribed goals;
 - Cultural or behavioural factors related to various integrated sets of norms and values.
- **Social assortment**: social mobility and biological variation

Social assortment: social mobility and biological variation

- Comparison of the biological characteristics of individuals according to their social origin and their own SES;
- Study of biological characteristics according to social mobility .

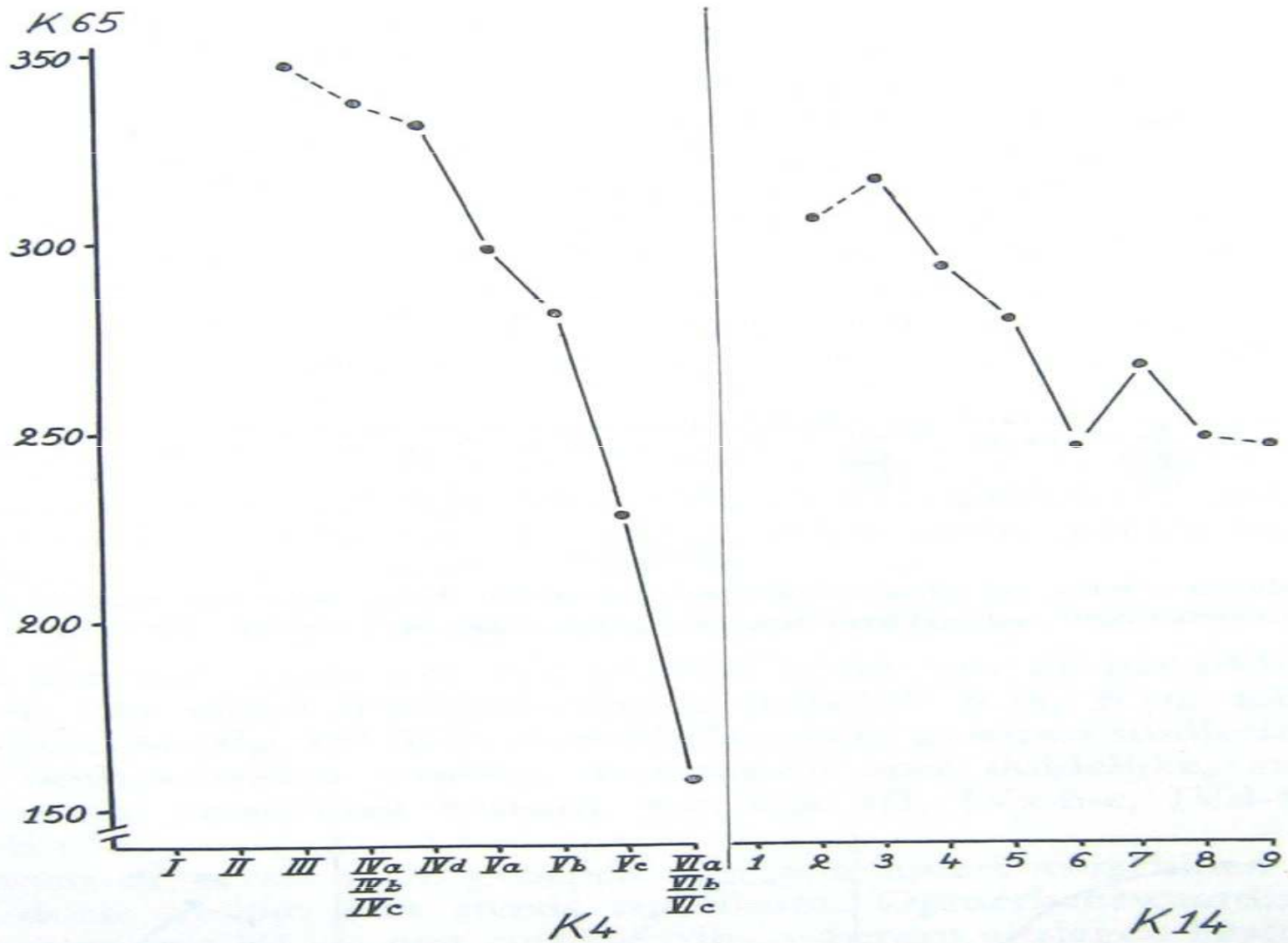
Biological differentials according to social origin and social status



Legend: — biological differences according to social status

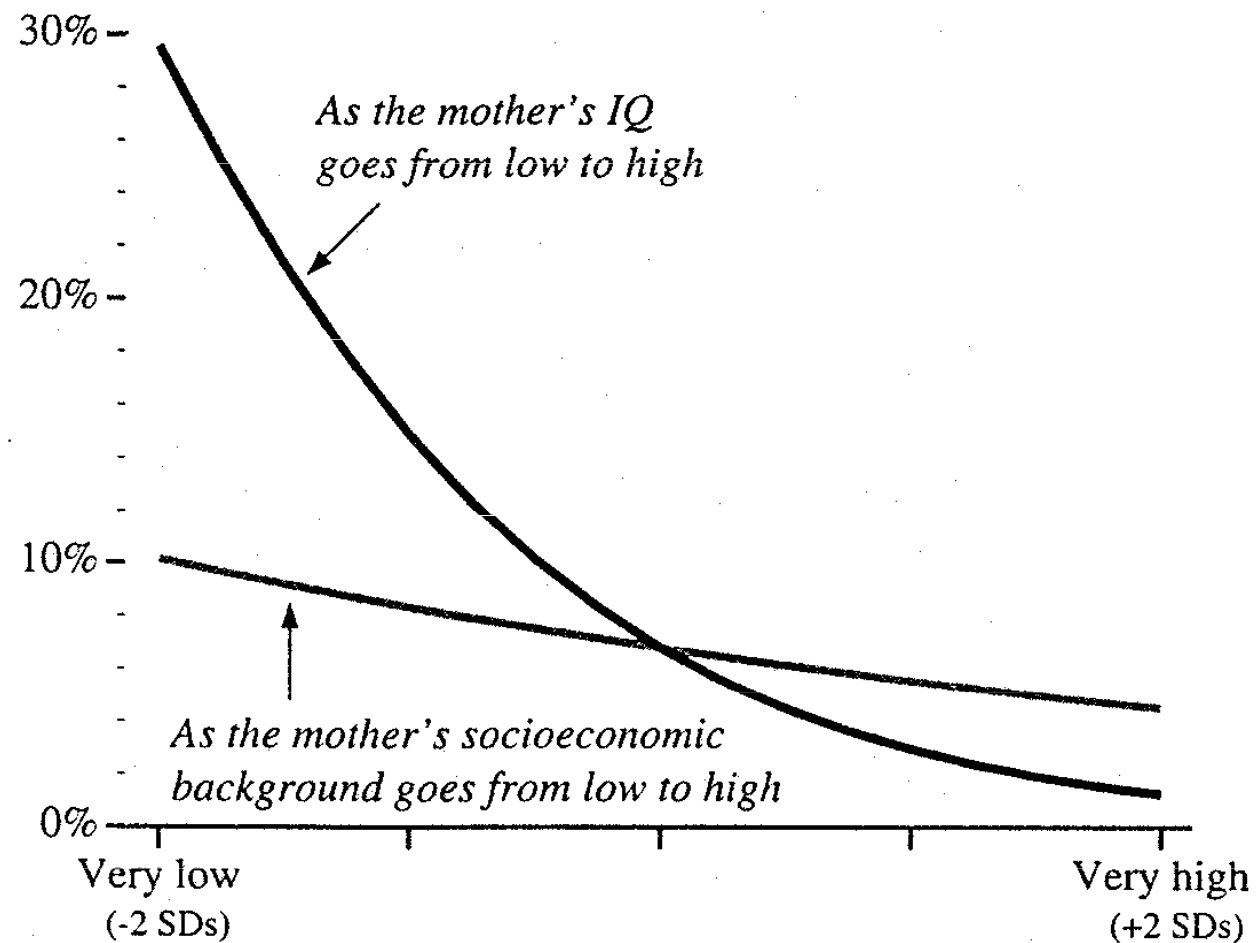
- - - biological differences according to social origin

Basic selection index by educational level and SES origin among non-university Flemish recruits (1960)



A white mother's IQ dominates the importance of socioeconomic background in determining the child's IQ

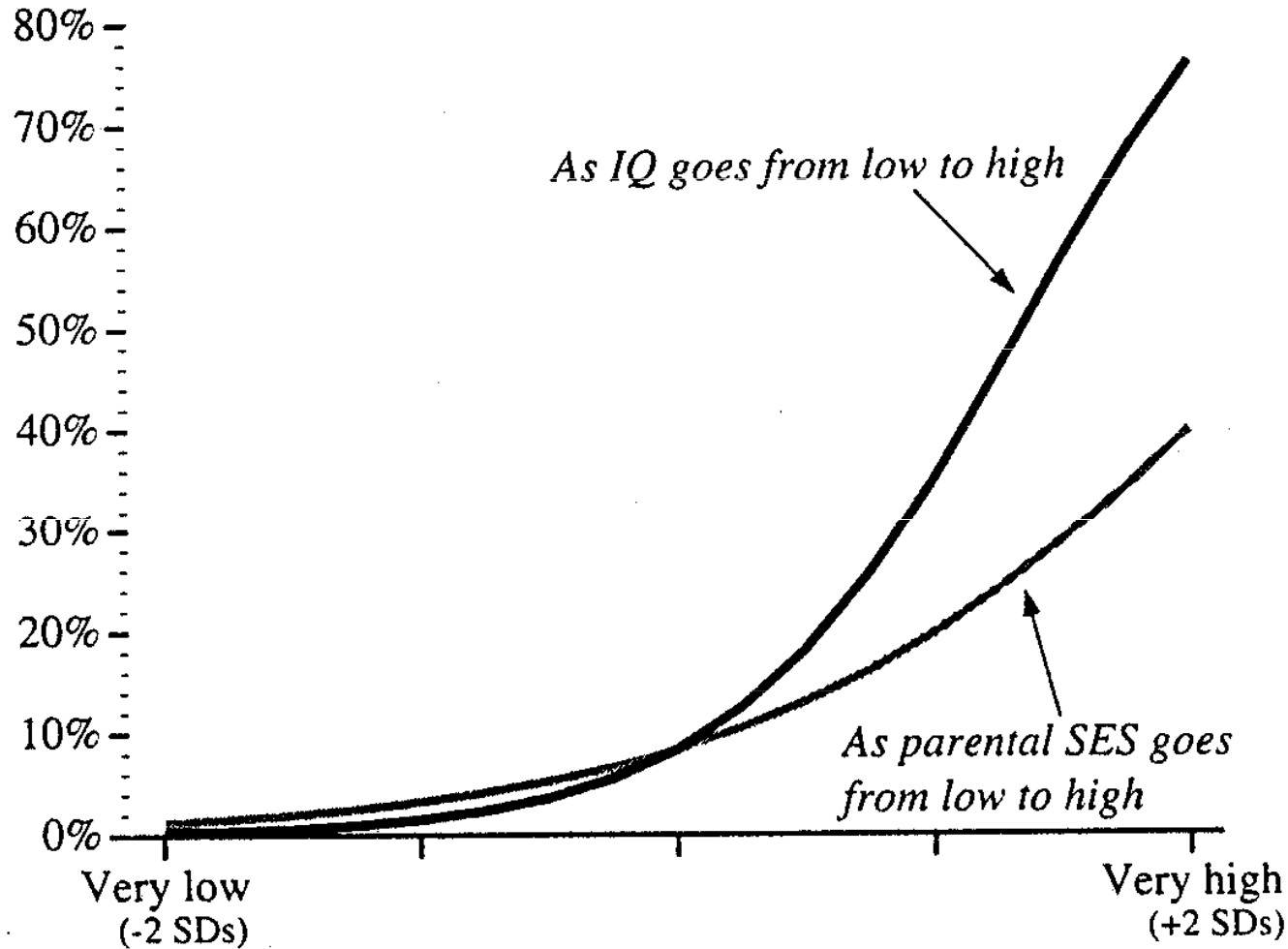
Probability of having a child in the bottom decile of IQ



Note: For computing the plot, age and either SES (for the black curve) or IQ (for the gray curve) were set at their mean values. Additional independent variables were used to control for the test year and the age of the children when they took the test.

For white youths, being smart is more important than being privileged in getting a college degree

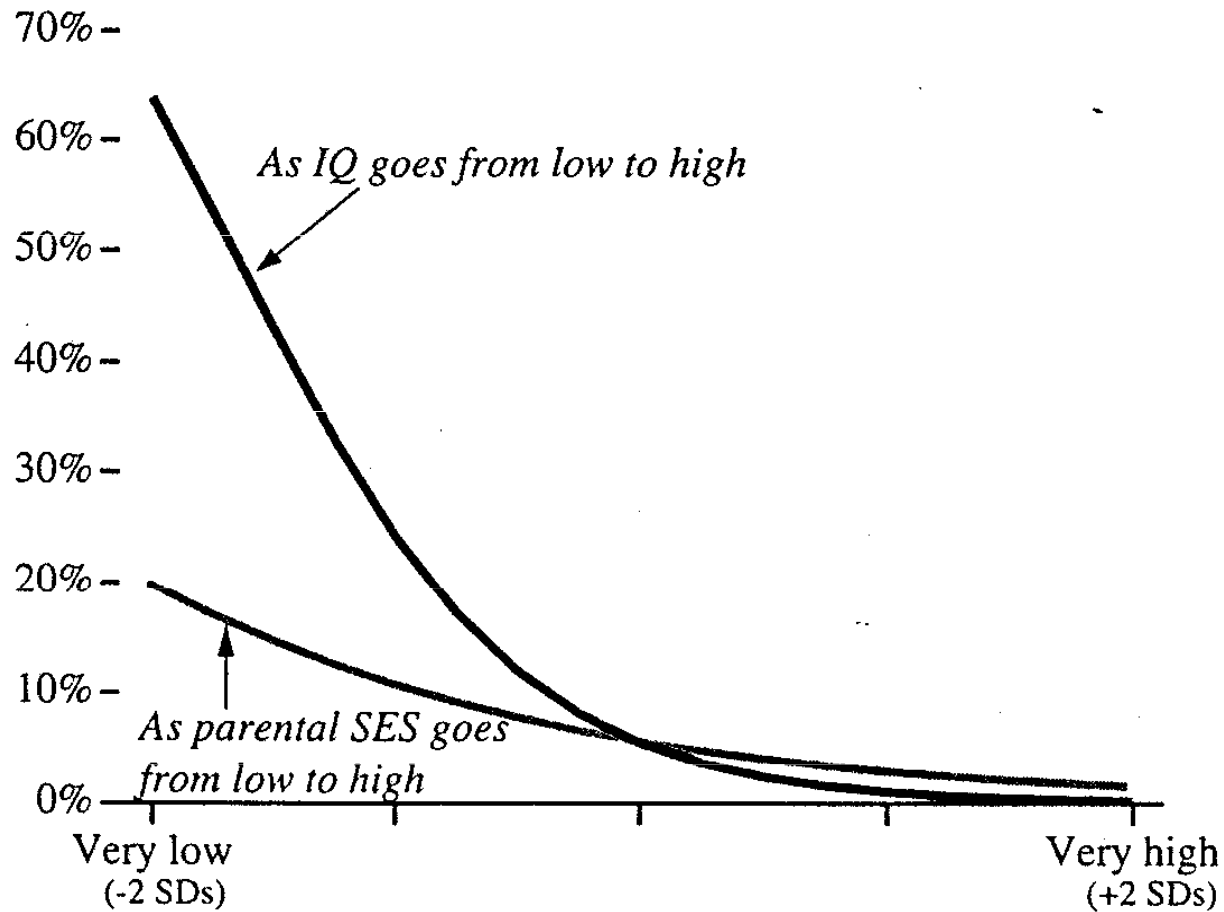
Probability of getting a bachelor's degree



Note: For computing the plot, age and either SES (for the black curve) or IQ (for the gray curve) were set at their mean values.

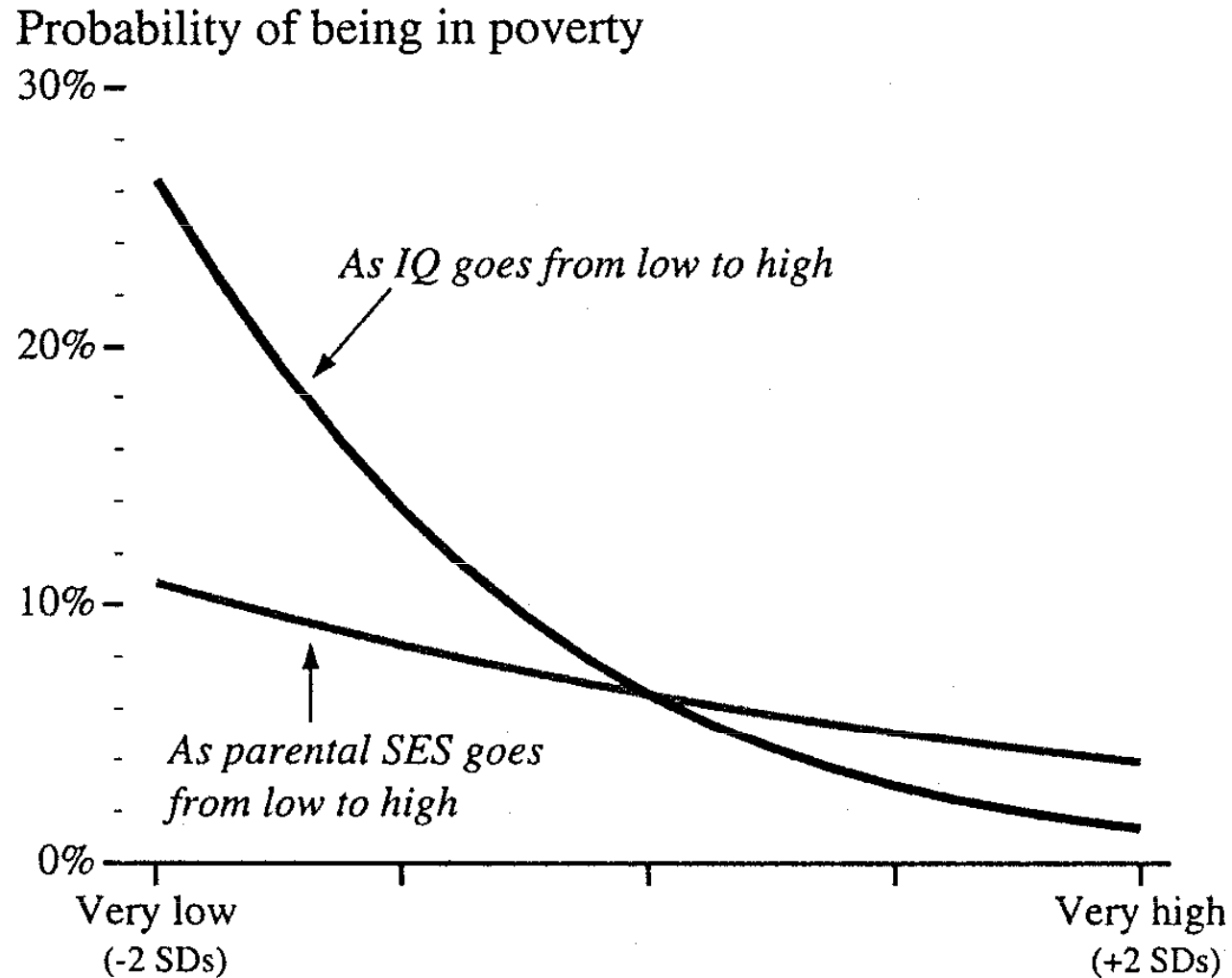
In predicting which white youths will never complete a high school education, IQ is more important than SES

Probability of permanently dropping out of high school



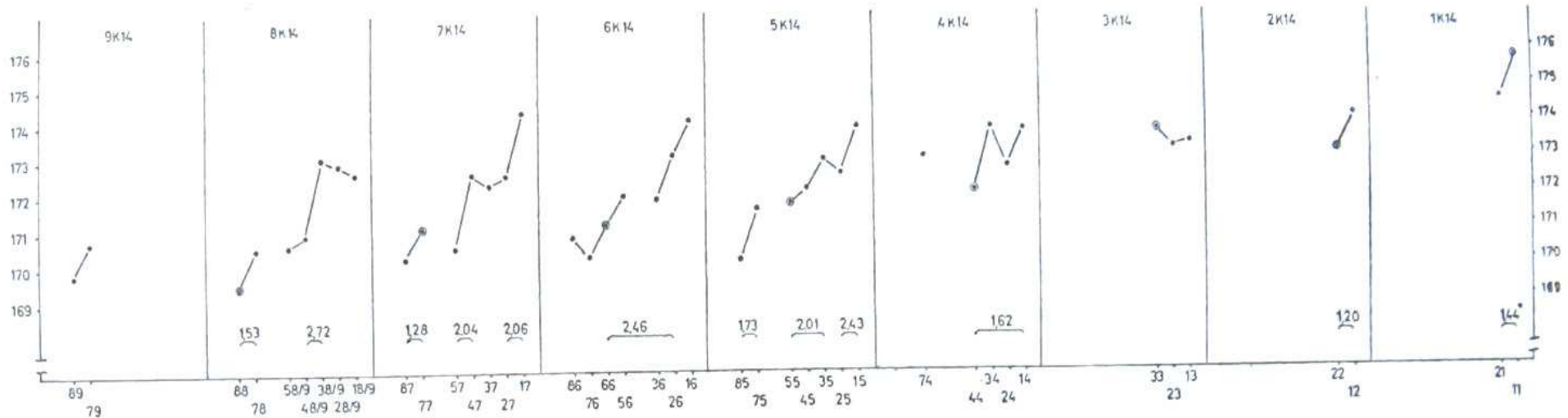
Note: For computing the plot, age and either SES (for the black curve) or IQ (for the gray curve) were set at their mean values.

The comparative roles of IQ and parental SES in determining whether young white adults are below the poverty line

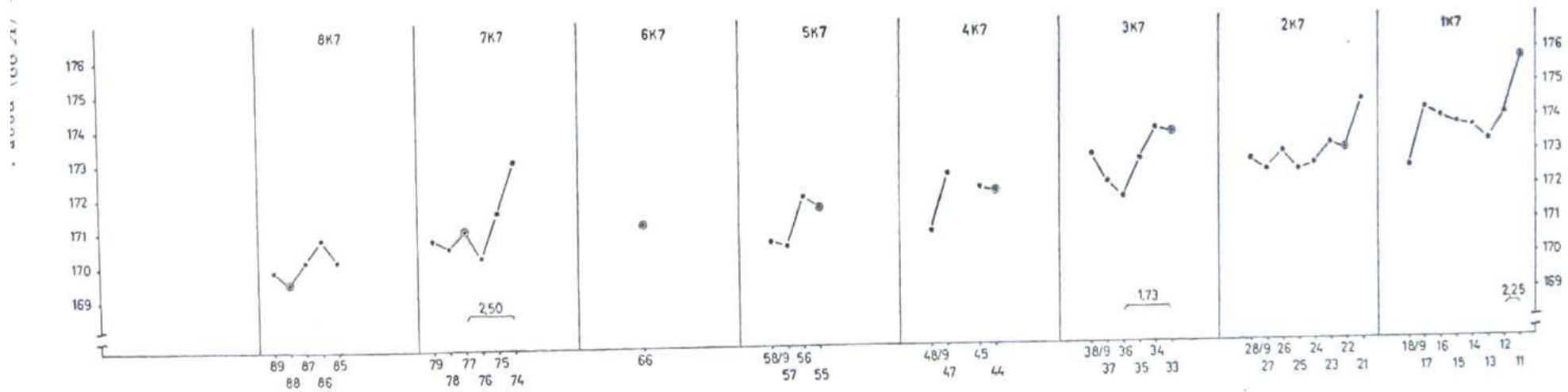


Note: For computing the plot, age and either SES (for the black curve) or IQ (for the gray curve) were set at their mean values.

Body height by social aspiration and social origin among Flemish recruits (1960)



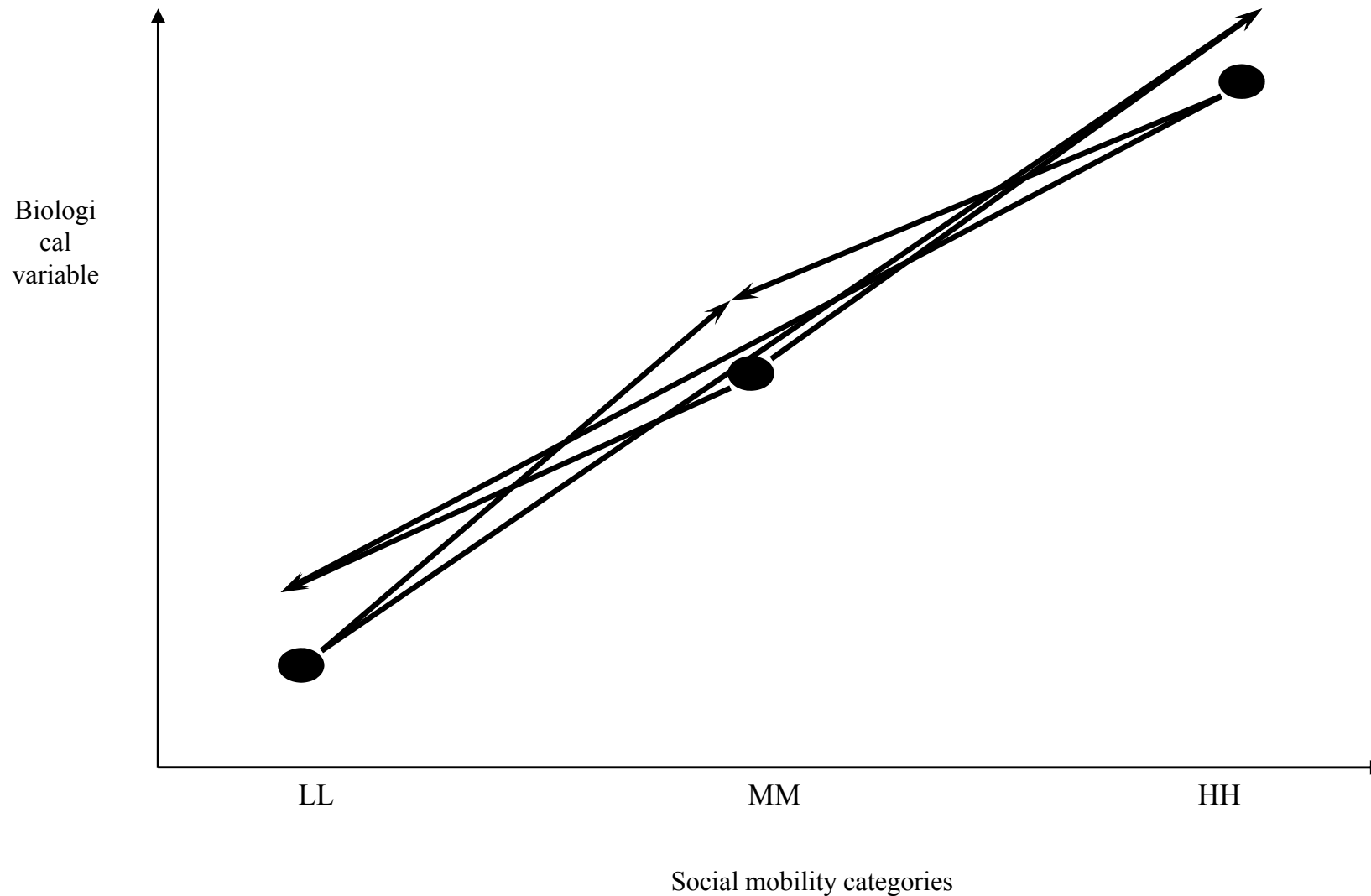
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Types of social biological research set-up in mobility studies

- Biological features of **adults** according to their social mobility with their parent(s);
- Biological characteristics of **children**, mobility categories on the basis of the SES of a parent and a grandparent;
- Biological characteristics of **women**, mobility categories on the basis of the comparison of the SES of the woman's father with the SES of her husband;
- Biological features of adults, mobility patterns of pairs of **brothers or sisters** within families;
- Biological characteristics of **parent-child pairs** and analyse the offspring variation according to their type of social mobility (only applied for IQ)

Social mobility and biological variation



Legend: LL = low sedentary group; MM = middle sedentary group;
HH = high sedentary group.

Biological features and social mobility

- Body height;
- Other biometrical measurements
- Maturation
- Physical attractiveness
- Blood groups and other polymorphic genetic markers
- Reproductive outcomes
- Health
- Cognitive performance
- Mental disorders

Degree of biological differences according to social mobility

- Biological differences between mobility categories is clearly related to the **degree** of upward or downward mobility
- Upward mobile individuals, on average, often score **higher** than the sedentary category towards which they move
- Downward mobile individuals, on average, also score **higher** than the sedentary category they join.

Opportunities for upward social mobility

- Social mobility is a statistically significant and increasing phenomenon
- Substantial increase of the **absolute** number of people from all socio-economic backgrounds in higher education
- **Relative representation** of workers' children in higher education institutions has not increased in recent decades

➤ **Proof** of persisting social inequities?

- **No consideration** of changes in the structure of the social stratification
- Most studies on inequality in university access **do not control** their data on the proportion of low class children that pursue university studies on the basis of either scholastic achievements or intelligence test results.
- Studies that did control for IQ or scholastic achievement still found a considerable **waste** of talent in lower classes

Explanations

- Social sortment: important phenomenon in social mobility:
 - Partly genetic
 - Partly environmental:
 - public policies provide **financial support for** educational moving up of children from financially modest environments
 - largely failed to deal adequately with the obstacles related to the **weak cultural and social capital** children from families in lower socio-economic strata (= sanctity of the family autonomy!)
 - social inertia and conservative forces (both in higher and lower classes)

- Mobility differentials in physique, health and cognition are driven largely by a **complex set** of causal processes, rather than by one or other single factor or trait.

Social sortment: individual or societal?

- Quantification?
- **Individual drives** in social assortment processes form a powerful mechanism in social mobility;
- **Societal** values and incentives may inhibit or stimulate mobility.

Genetics and social mobility

- To what degree are not only phenotypes, but also **genotypes** being assorted?
- What are the implications of the processes of **segregation and recombination** of genes for social mobility?
- What role plays **mate choice** in the social assortment of biological

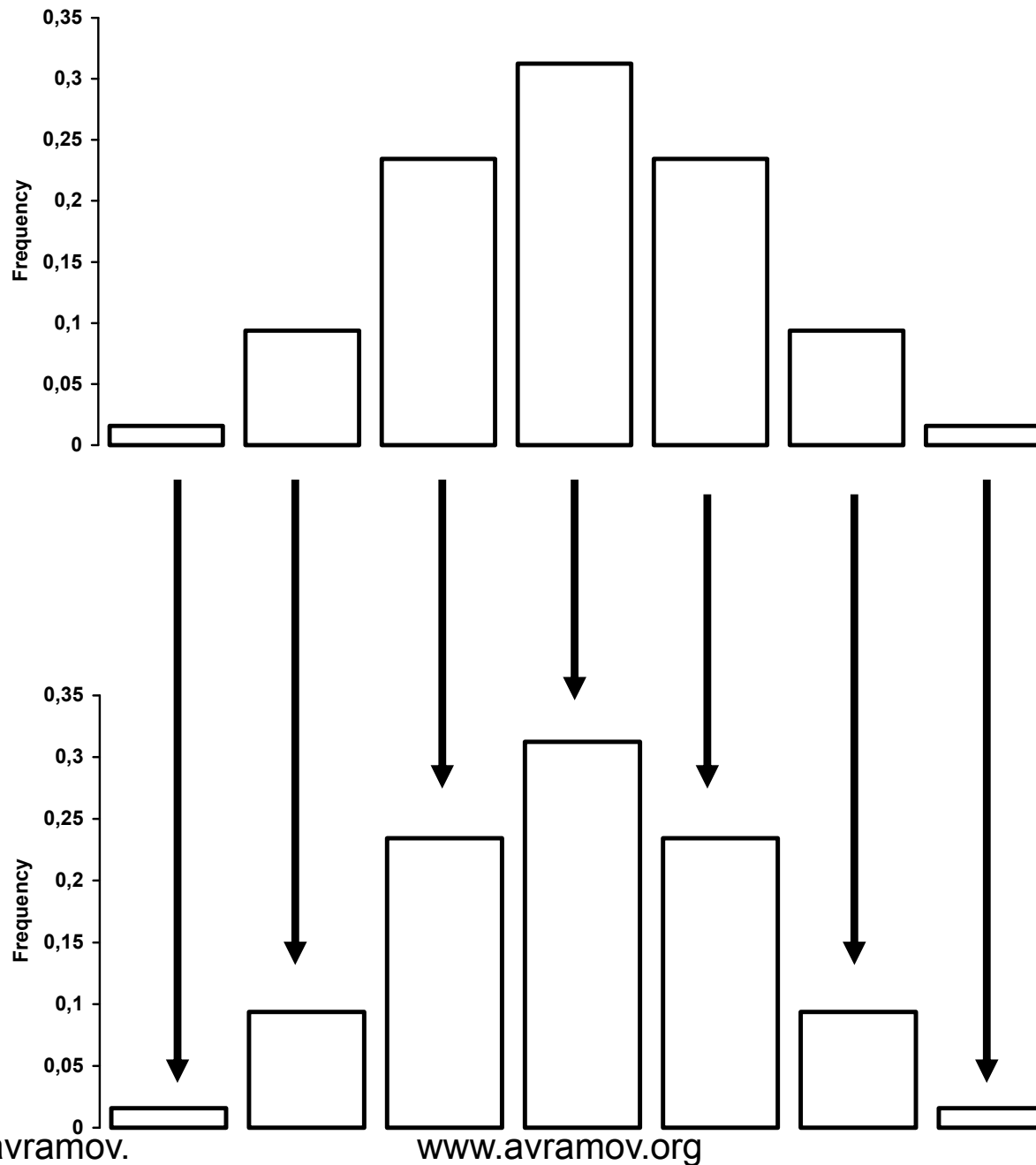
The assortment of phenotypes and genotypes

- Many biological or biologically influenced characteristics involved in social mobility assortment show a relatively **high heritability**:
 - stature ($h^2 = 0.7-0.9$)
 - intelligence ($h^2 = 0.4-0.8$)
 - emotional personality characteristics ($h^2 = 0.3-0.5$)
 - liability towards schizophrenia ($h^2 = 0.63-0.67$)
- Substantial genetic variance underlying the phenotypic variance of characteristics such as intelligence allows concluding that non-random social mobility regarding such characteristics is an important factor in the causation of a **partial genetic differentiation** of socio-economic status groups.

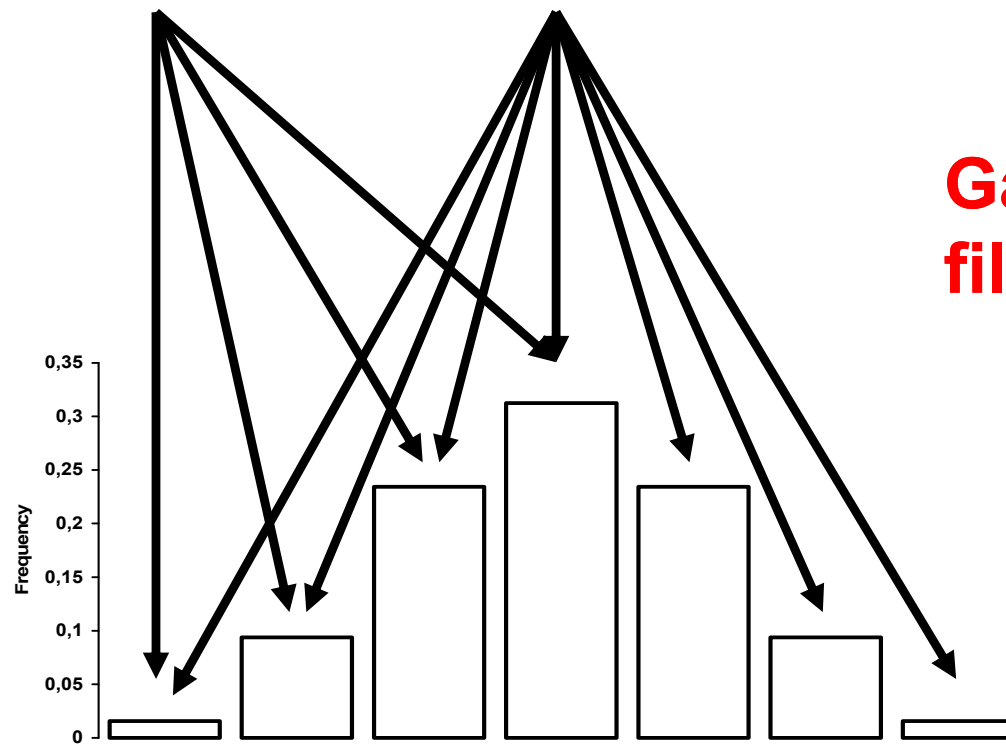
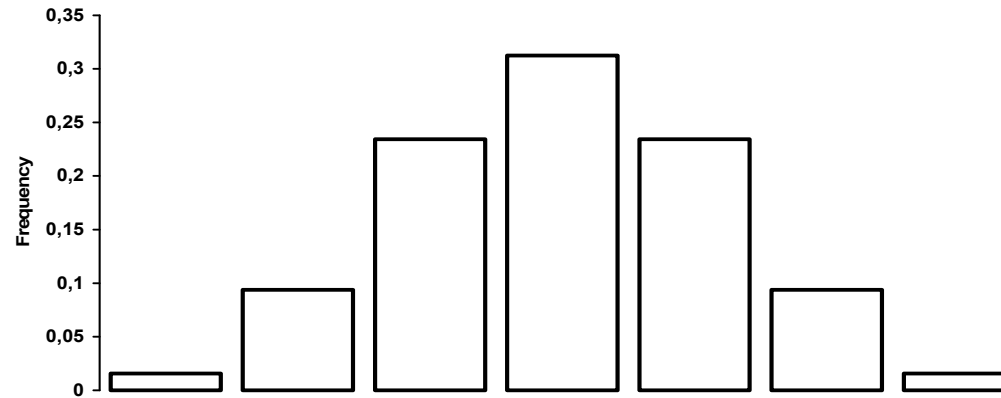
Segregation and recombination of genes and social mobility

- Genetic basis for social mobility resides in the **Mendelian inheritance system** of sexually reproducing organisms
- Sexual reproduction does not allow a purely **'vertical'** transmission of genetic information in a genetically heterogeneous population
- Segregation at meiosis and recombination of genes at fertilisation produce a **redistribution** of the genotypes over the various phenotypic categories in a random mating population

A-sexual, pre-mendelian transmission of genes

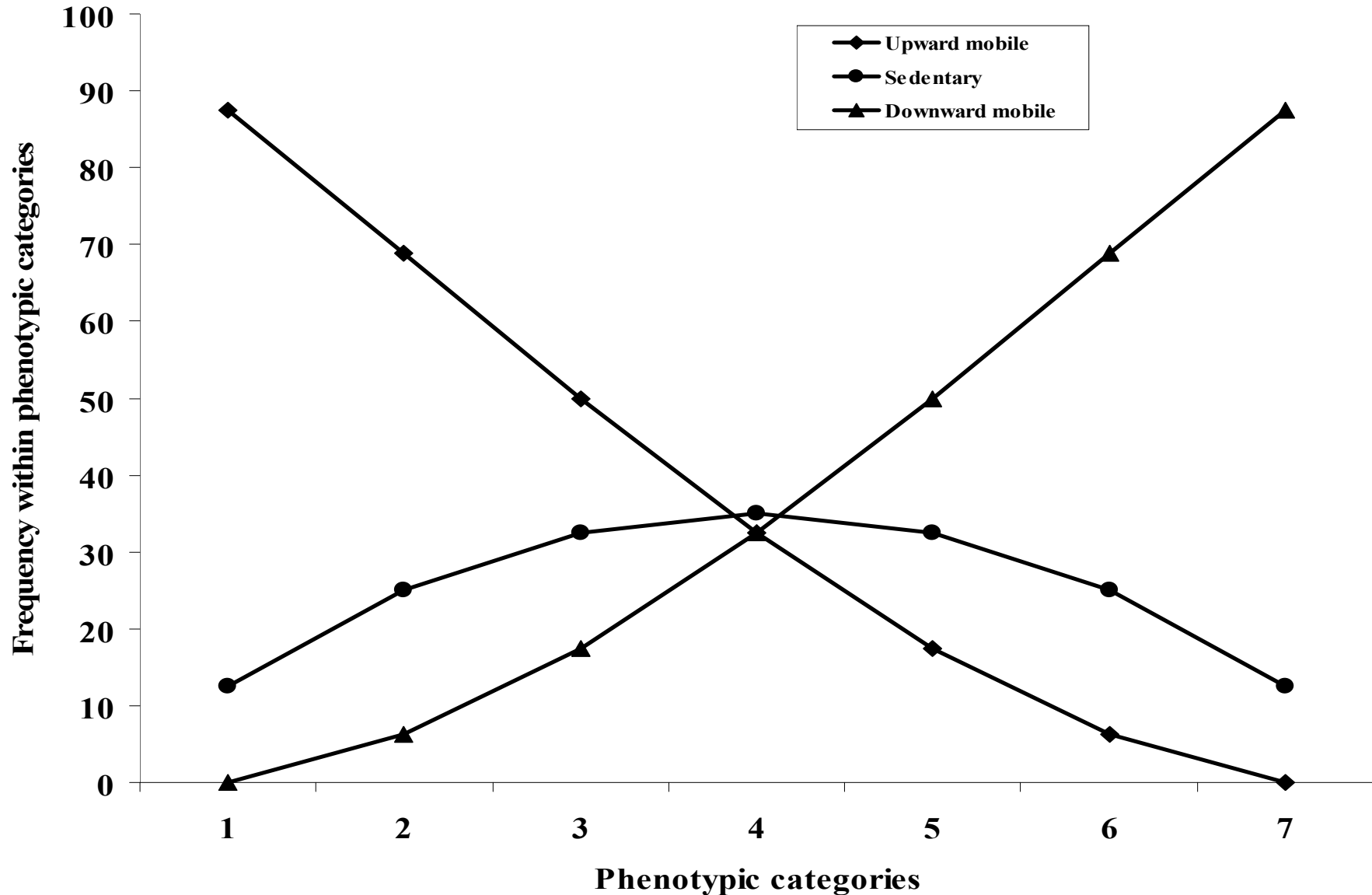


Genotypic redistribution for a polygenic trait with three allele pairs



Galton's law on filial regression

Theoretical probability for F1 offspring remaining sedentary or migrating to 'lower' or 'higher' phenotypic categories than the parental ones (3 allele pairs)



The genetic role of social mobility

- In the hypothesis of an initial functional **covariance** between different genotypes and different social strata within a population, the intergenerational (poly)genetic redistribution system will **dissociate** this covariance, and maintain genotypes in social strata where they do not belong.
- **Social mobility** is a necessary mechanism for **counterbalancing** the effect of allele recombination which restores the genetic heterogeneity of genetically assorted social categories in subsequent generations.

Genetic-environmental complexity in social mobility of intelligence

- **Biological factors:**
 - Regression to the mean
 - Many more gene pairs involved
 - Other genetic mechanisms (dominance, epistasis)
 - Several other personality and also physical characteristics are involved.
 - Biological environmental factors
- **Social factors:**
 - Ideological goal of equal opportunity
 - economic dynamics in modern culture
 - socially conservative pressures
 - incomplete assortative mating

Misunderstanding about the role of Mendelian genetics in social class differentiation:

*“Environmentalists sometimes misunderstand the implications of population genetics, thinking that heredity would imply **“like class begets like class”**. Probably the opposite is true. Only very strong social and environmental forces can perpetuate an artificial class; **heredity does not**. From this point of view, social forces are more conservative than hereditary ones” (Li, 1971, 172).*

Effects of democratisation on genetic reshuffling and social mobility (Eckland, 1975)

➤ Short-term:

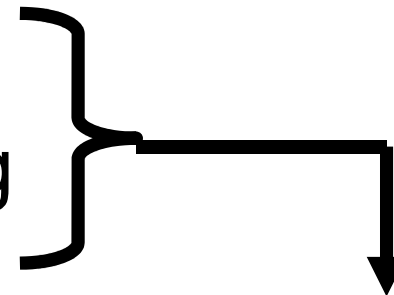
- Assortment and redistribution of genetically influenced characteristics:



no genetically fixed social classes;

➤ Long-term:

- continual social mobility
- positive assortative mating

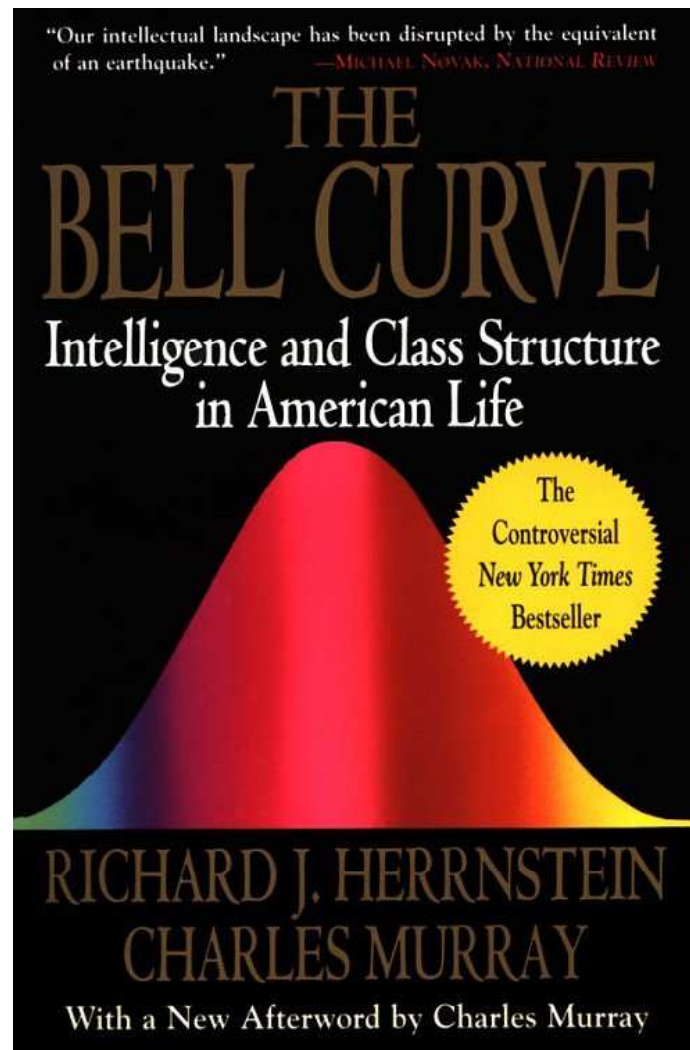


somewhat self-limiting

The role of mate choice in the social assortment of biological characteristics

- mate choice is overwhelmingly characterized by positive assortative mating
- Individual mate choice and social assortment interact
 - **passive** component of mate choice: social propinquity;
 - **active** component: individual mate choice
 - Same characteristics
 - Different characteristics (e.g. **physical beauty**)
- Assortative mate choice = amplifier to the assortative effect of non-random social mobility.

The controversy concerning 'The Bell Curve'



The Bell Curve's central thesis

Social stratification in contemporary American society is almost uniquely a question of individual differences in intelligence levels, resulting in the emergence of a 'cognitive elite' that is getting richer, increasingly physically segregated and increasingly intermarried.

Contents of “The Bell Curve”

- Valorisation of cognitive ability through the democratization of the educational system: creation of a **cognitive elite**;
- Identification of a series of **social problems** as the consequence of low intelligence:
 - risks for ending up poor,
 - becoming or remaining unemployed,
 - becoming chronically dependent on welfare aid,
 - developing criminal behaviour;
- Analysis of these relationships to the **ethnic/racial** composition of American society;
- Identification of **policy implications** from an ideologically conservative point of view.

Reactions to “The Bell Curve”

- Scientific criticisms
 - Partly justified
 - Overall, a fairer and more balanced judgement would have been appropriate.
- Ideological criticisms

Evaluation of “The Bell Curve”

- Includes a lot of **interesting** findings;
- Interpret the gradual within-population differences in cognitive performance **unjustly** in a dualistic polarity;
- Use relatively high estimates of **IQ heritability** in their interpretation, although the use of lower estimates would not have changed the essence of their conclusions;
- One-sided emphasis of IQ as the most important economic asset;
- **No mention of the redistributing role of polygenetic inheritance in their analysis of the role of cognitive ability in social class and social mobility dynamics in America;**
- **Conclusions** do not entirely match the findings of the study, but are largely inspired from a conservative point of view.

Socialism versus meritocracy

➤ Defining 'socialism':

- broad array of ideologies and political movements with the goal of a socio-economic system in which **property** and the distribution of wealth are subject to control by the community.
- **humanistic ideology** directed towards a social-ethical end, i.e. striving for an egalitarian society in which everyone is allowed to have **equal opportunities** to develop their talents.

➤ Defining 'meritocracy':

- type of society where social status is assigned through competition or demonstrated **talent and competence**, rather than on wealth (plutocracy), family connections (nepotism), sex (sexism), ethnic group (ethnocentrism), class privilege, etc.

“The rise of the meritocracy”

- Michael Young (*The Rise of the Meritocracy*, 1958):
 - a meritocratic society would result in the rise of a new exclusive social class as discriminatory as the older ones,
- Aldous Huxley (*Brave New World*, 1934):
 - socio-genetic stratification of unalterable α , β , γ , δ , and ϵ classes.
- Young’s fear and Huxley’s science fiction rely on a **fundamental misunderstanding** of the genetic redistributive power of the genetic (and more in particular polygenic) transmission system in sexually reproducing organisms.
- What one has to fear is that **nepotism or other socially conservative mechanisms** which formed the basis of non-meritocratic systems, continue to undermine the very foundations on which a meritocratic society is built.

Are socialism and meritocracy incompatible forms of societal organization?

- Socialism = strictly egalitarian society in which excellence is to be avoided rather than to be promoted → diametrically opposite to the goals of a meritocratic system;
- Socialism = equal opportunities for individuals to develop their talents
→ both systems are perfectly compatible.

Matching biological variation and social stratification

- **Meritocratic** society:
 - Take into account **biological variation** in talents and abilities;
 - Avoid **social exclusion** of less gifted.
- Former **communist** regimes and present socialized **market** regimes:
 - **both failed** in solving in a societally satisfactory way the problem of reconciling, within- as well as inter-generationally, sources of biological variation within populations and the social stratification in their societies
 - Former communist regimes: full employment, but unmotivated workers;
 - Present market economies: high unemployment, overstressed employed.

Perpetuation of functional and creative modern society

- Democratization policies need to facilitate social mobility **in each generation** again in order to get the 'right person on the right place';
- Range of differential rewards needs to **reconcile** meritorious policies with social policies aimed at inclusion.