

The Sociology of Biological Intelligence

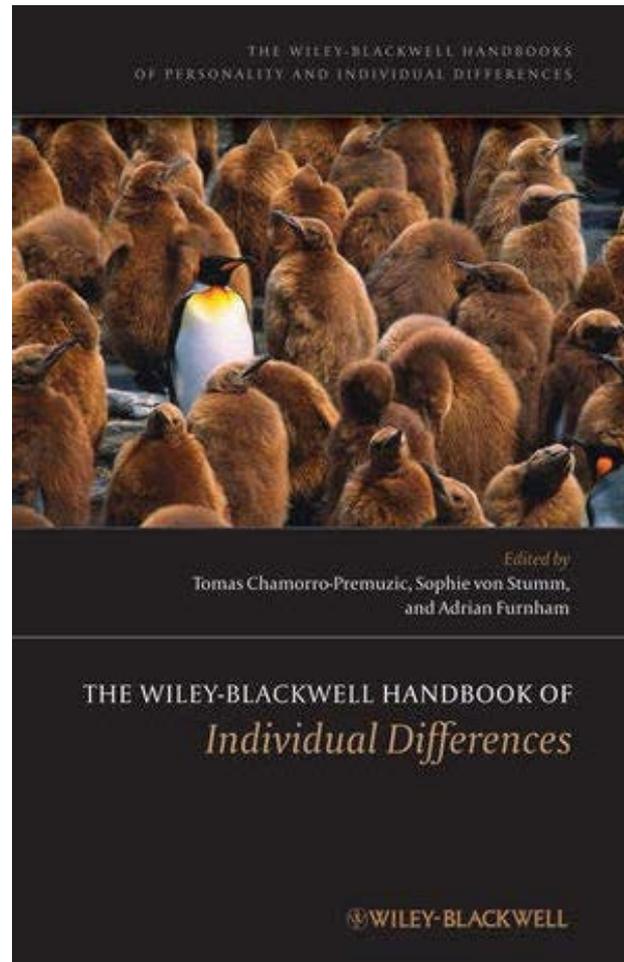
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Speaker notes can be toggled on or off

Hans J. Eysenck Lecture
International Society for the Study of Individual Differences
London, July 26, 2011



Eysenck and the London School



Three points & three examples

3 points about variation in g

- Human variation in g  social structure
- Population variation is a *social* fact
- Use life tasks as a heuristic to trace its structural effects

3 examples of structural effects

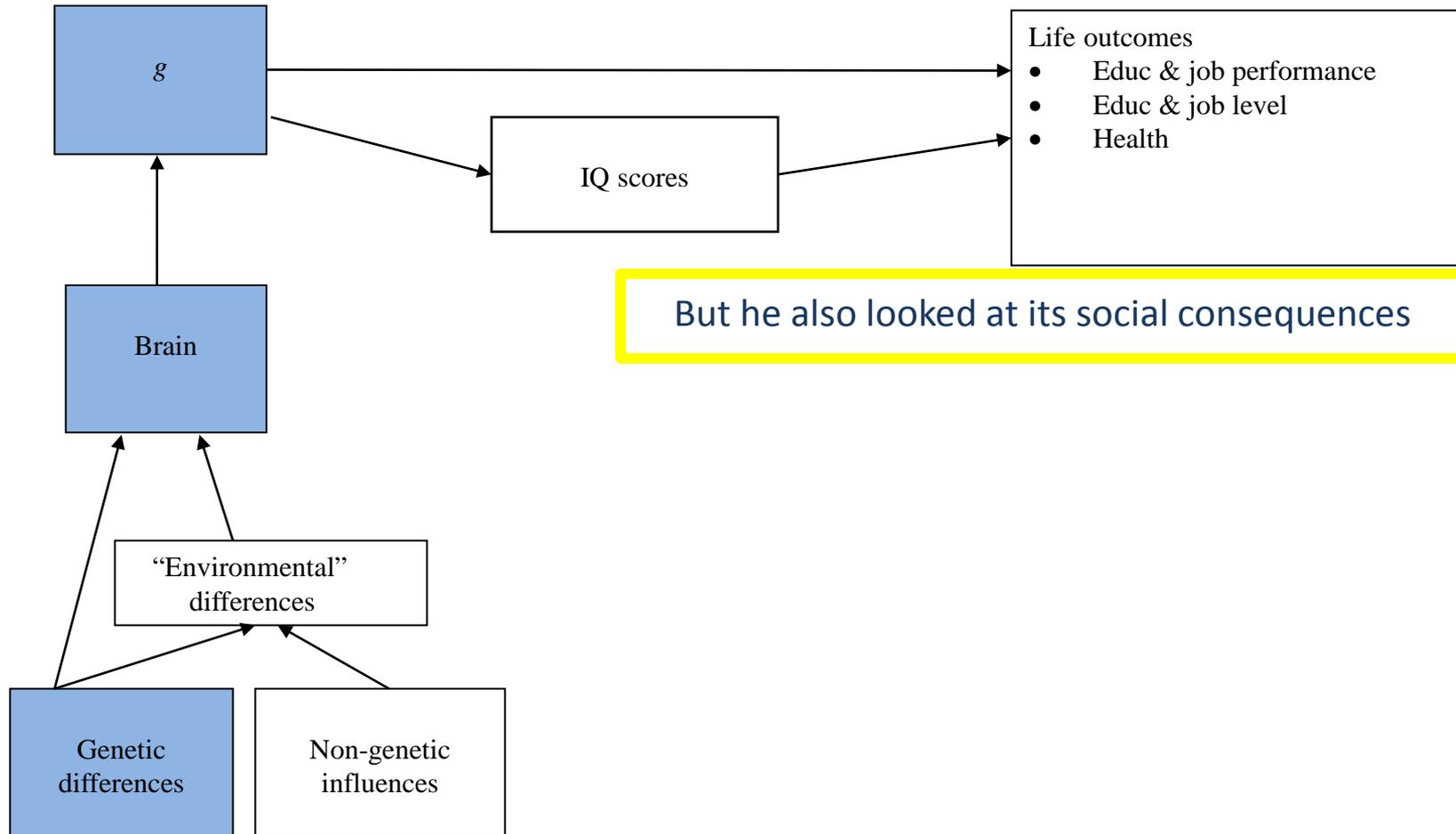
- Evolution of occupational hierarchy
- Evolution of high human intelligence
- Emergence of pervasive health disparities



Eysenck's biological (vertical) focus

V
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HORIZONTAL



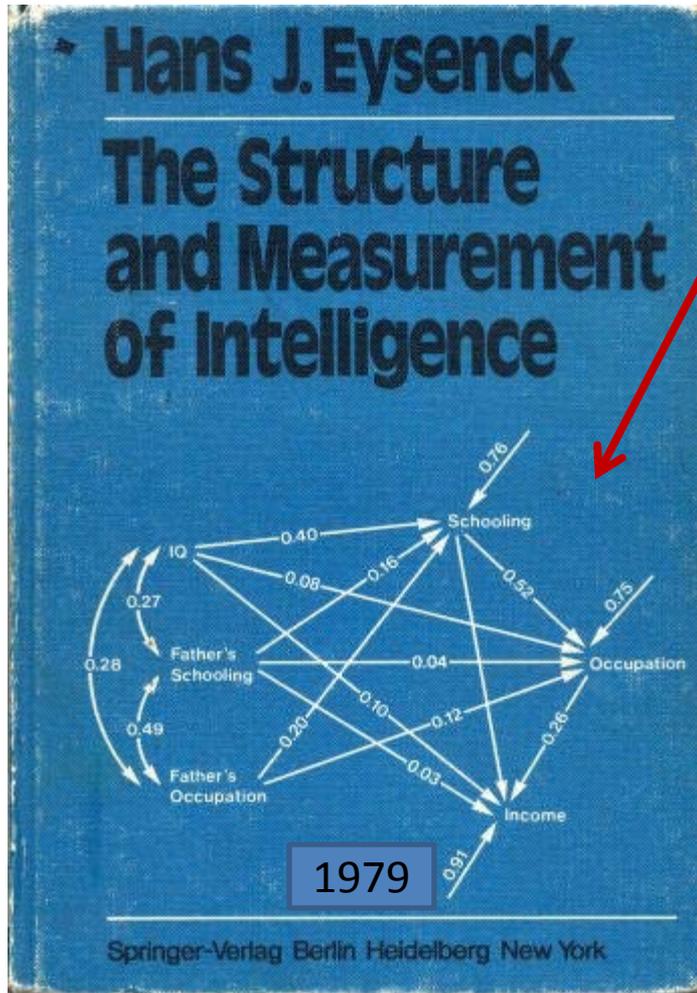
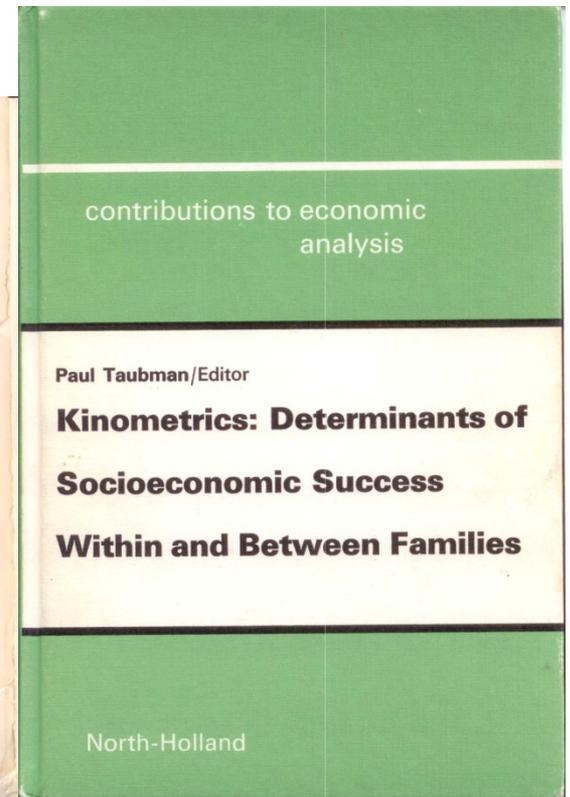
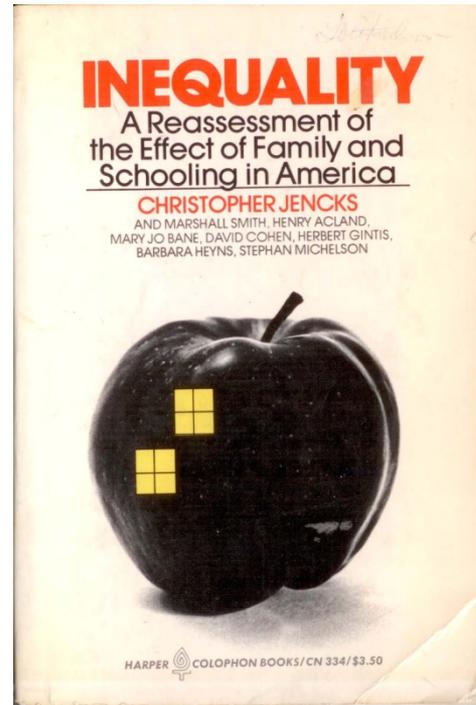


Sociologists' life-course path model

Early heritability of social class studies

1977

1972



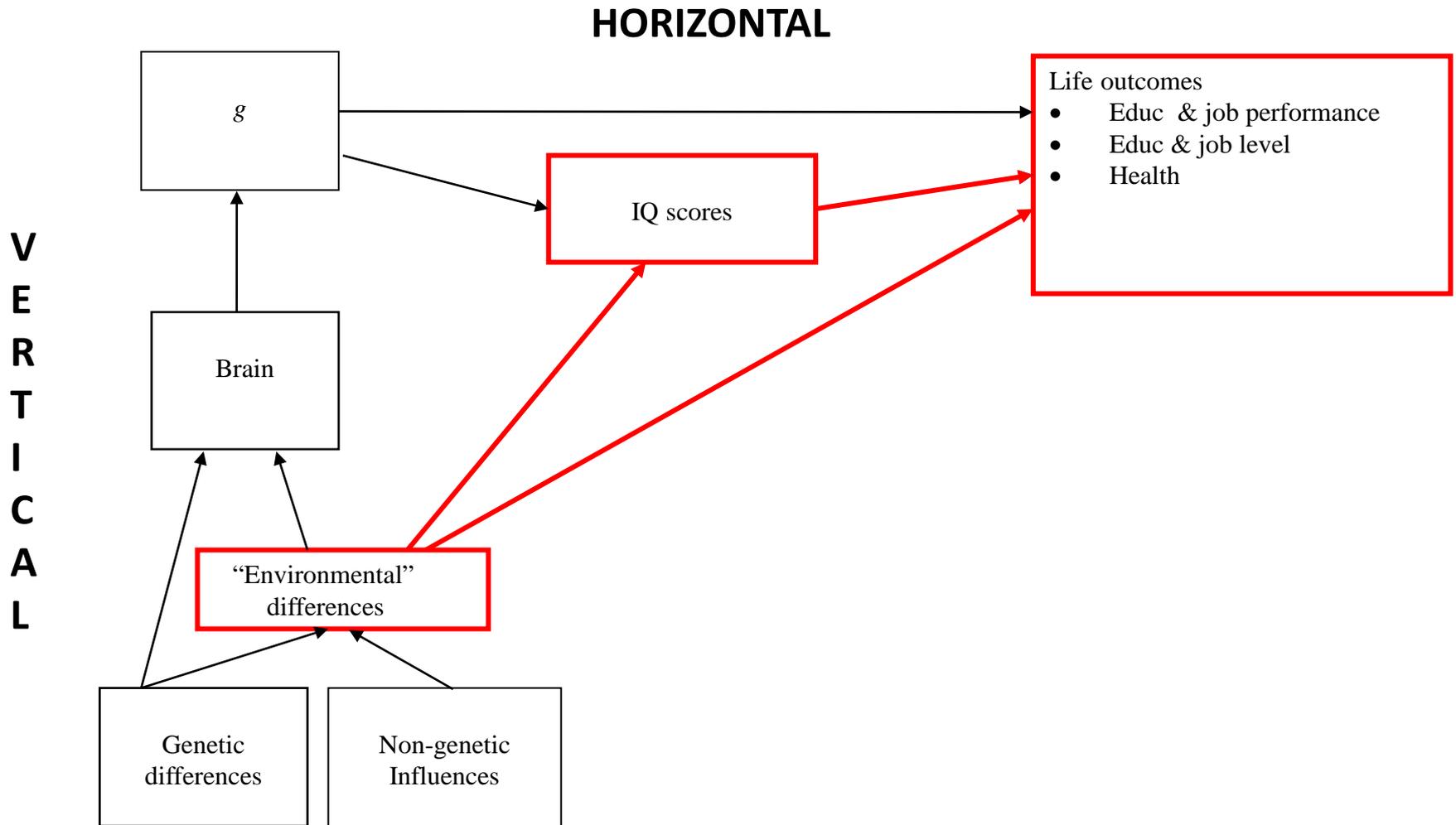


Consistent pattern of correlations

	Father	Son			
	Occupation	IQ	Education	Occupational	Earnings
Father					
Education	.48	.27	.40	.28	.20
Occupation		.29	.38	.31	.22
Son					
IQ			.57	.46	.28
Education				.61	.38
Occupation					.43

Object of much causal modeling

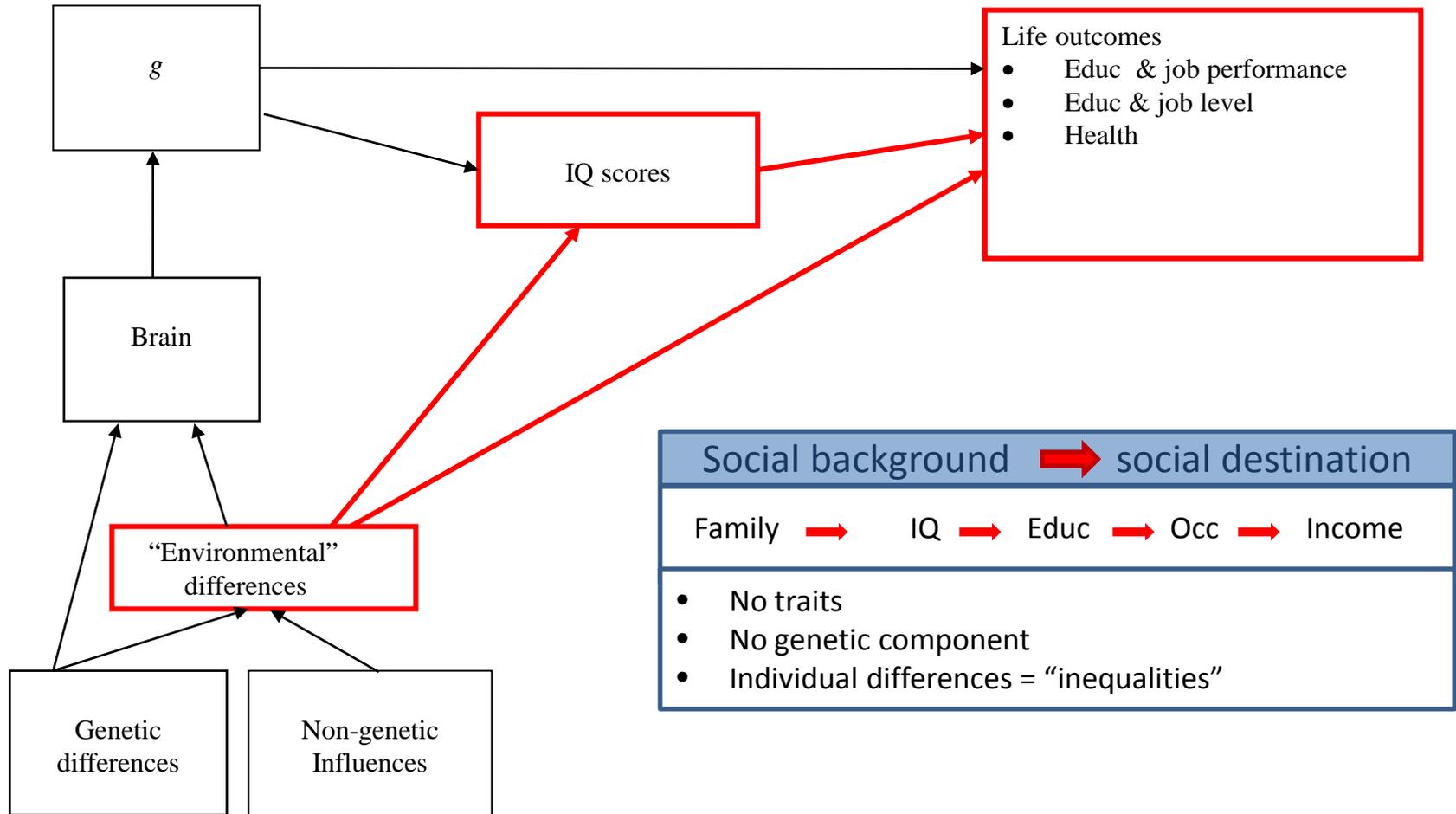
Sociology's assumptions & inferences, 1970s



Sociology's assumptions & inferences

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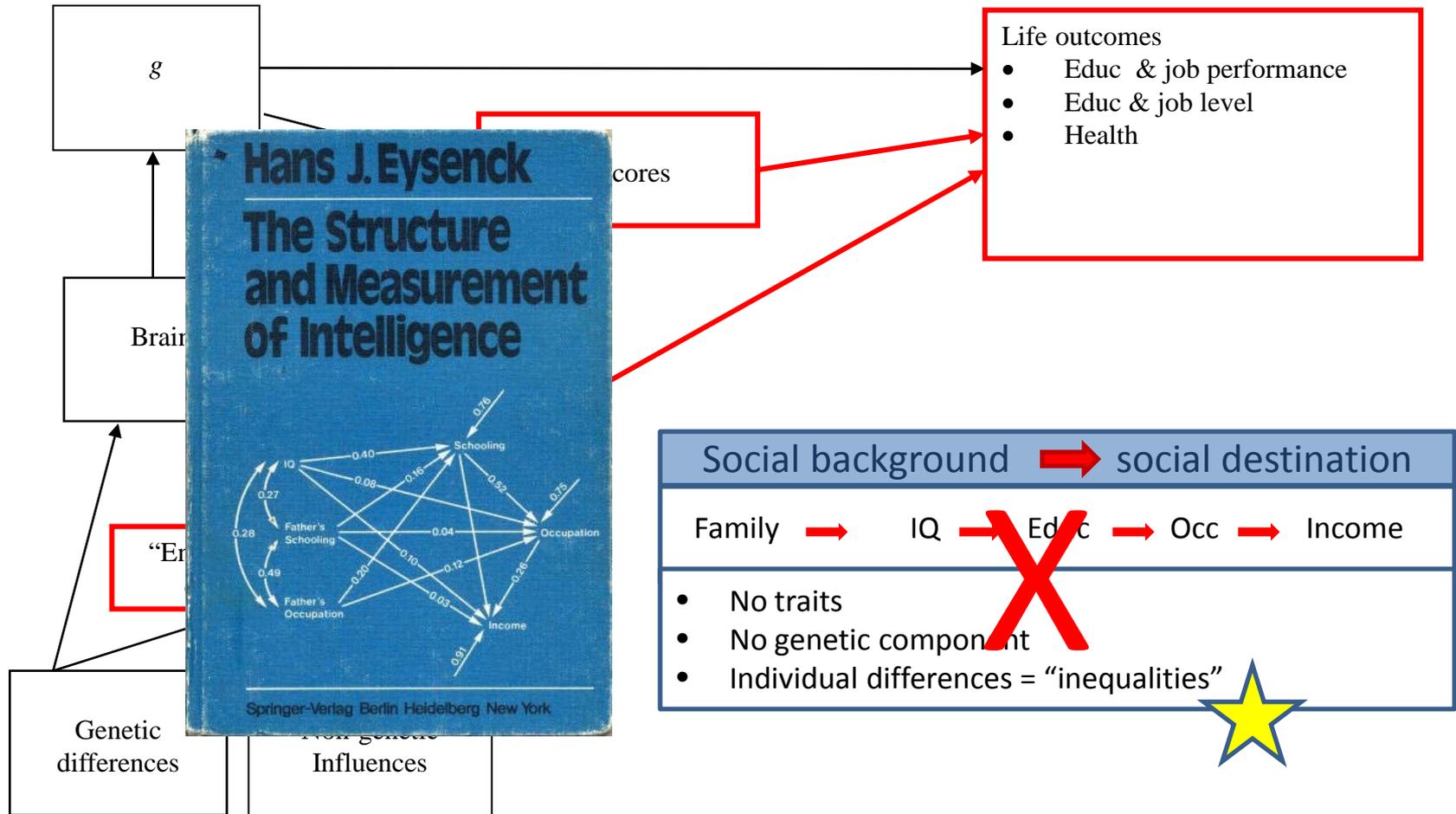




Sociology's assumptions & inferences, 1970s

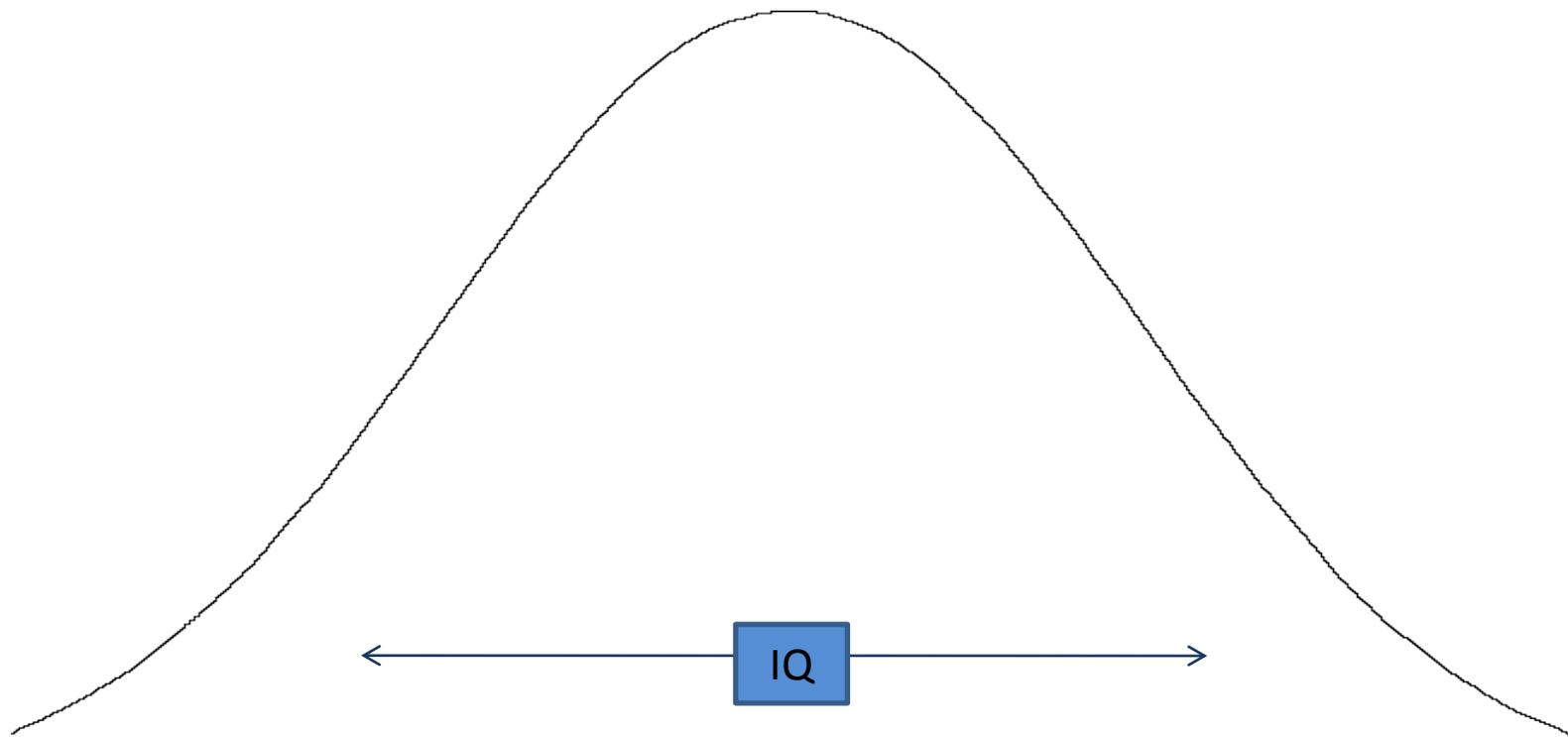
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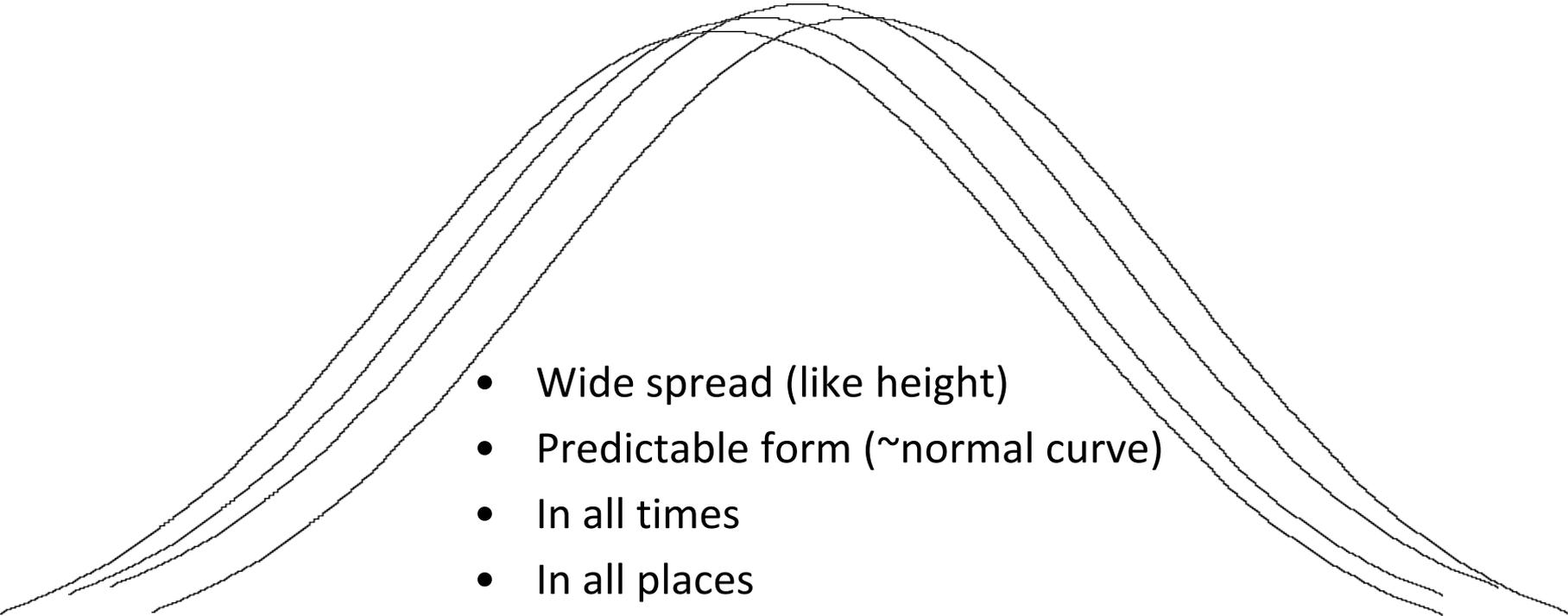


Human variation = biological fact





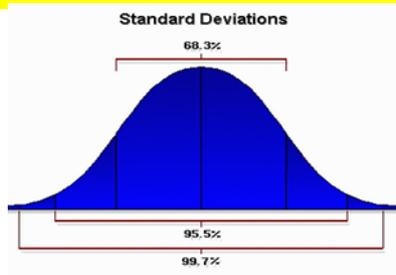
Everywhere

- 
- Wide spread (like height)
 - Predictable form (\sim normal curve)
 - In all times
 - In all places



My focus—what role variation?

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HORIZONTAL

Life outcomes

- Educ & job performance
- Educ & job level
- Health

IQ scores

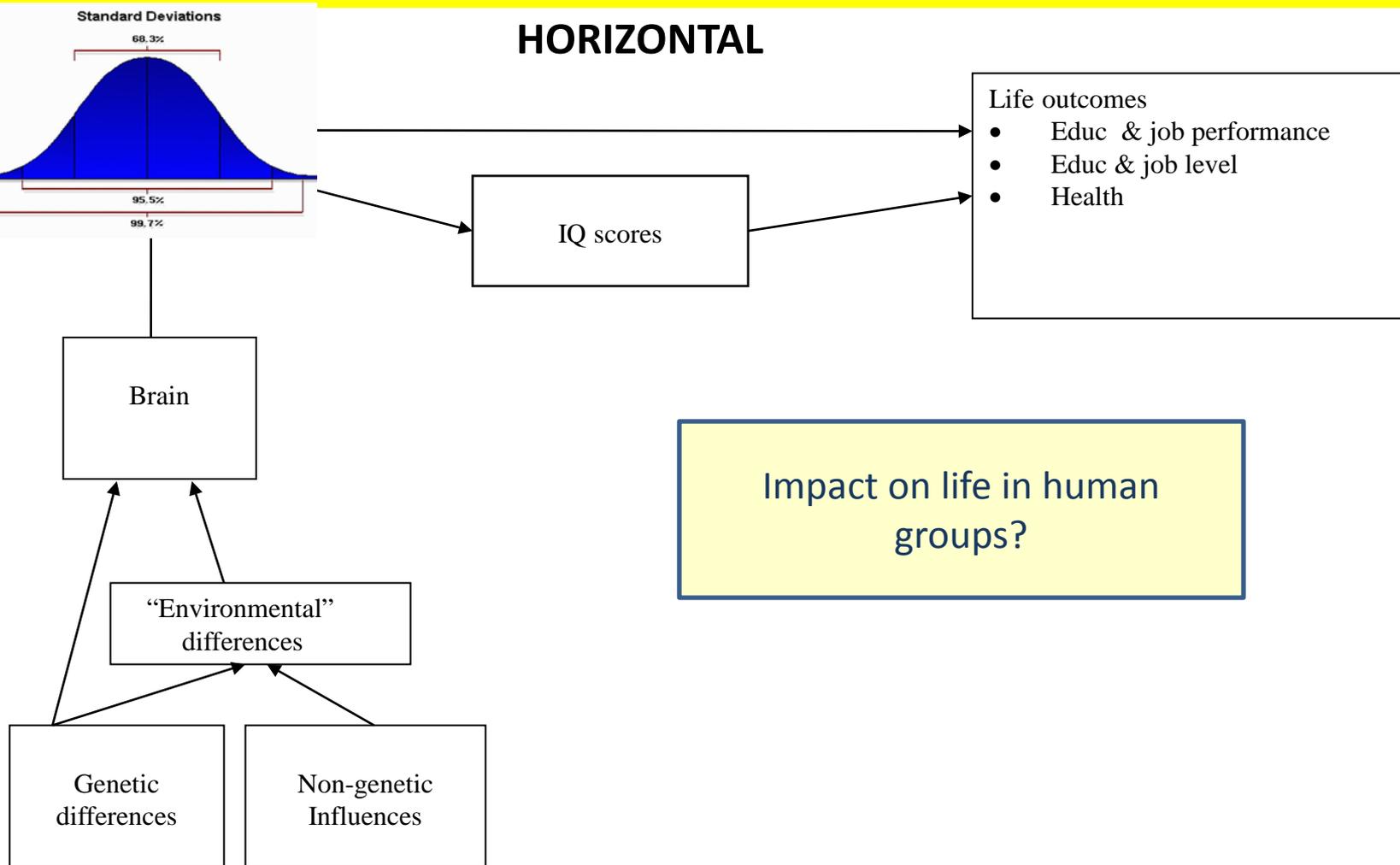
Impact on life in human groups?

Brain

“Environmental”
differences

Genetic
differences

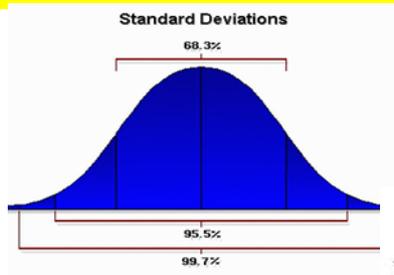
Non-genetic
Influences



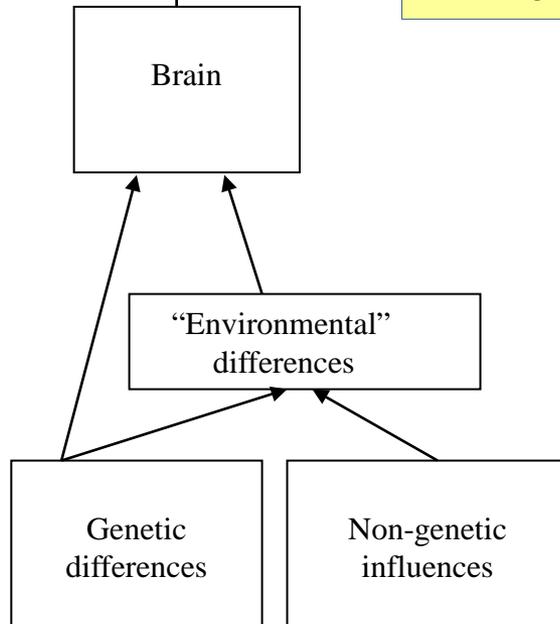
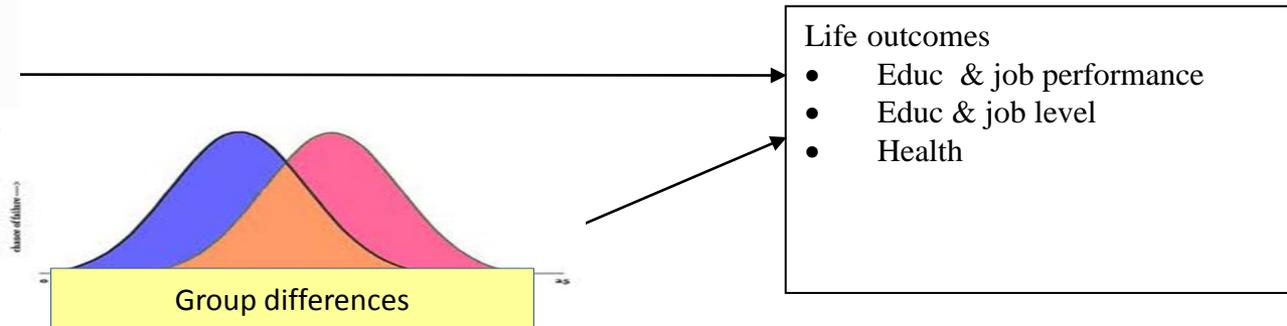


Sociology of intelligence

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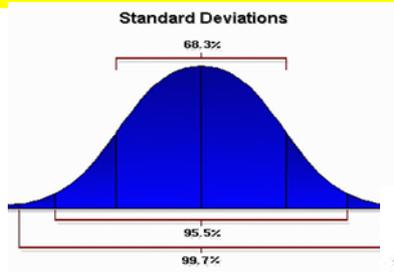
HORIZONTAL



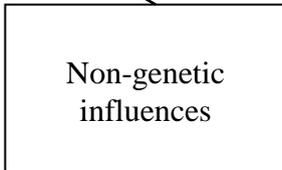
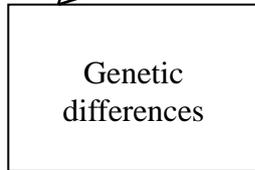
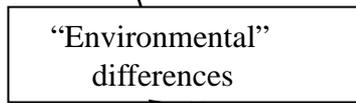
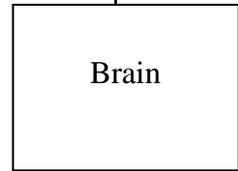
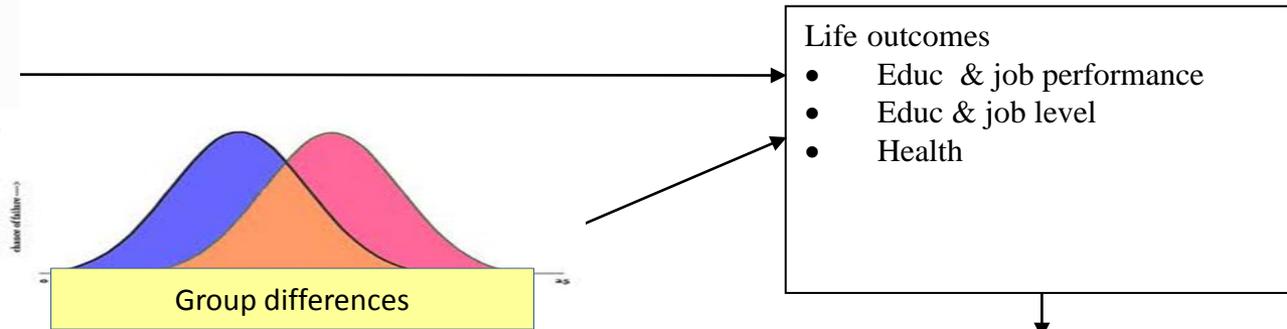


Sociology of intelligence—other units of analysis

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HORIZONTAL



Flows of info
& error
(Robert
Gordon)

Geography of
intelligence
(Richard Lynn,
Phil Rushton)

Syntality (R. B.
Cattell, Heiner
Rinderman)

Interpersonal contexts (**proximal**)

- Rates of social pathology
- Sub-group norms, mores
- Disorganization

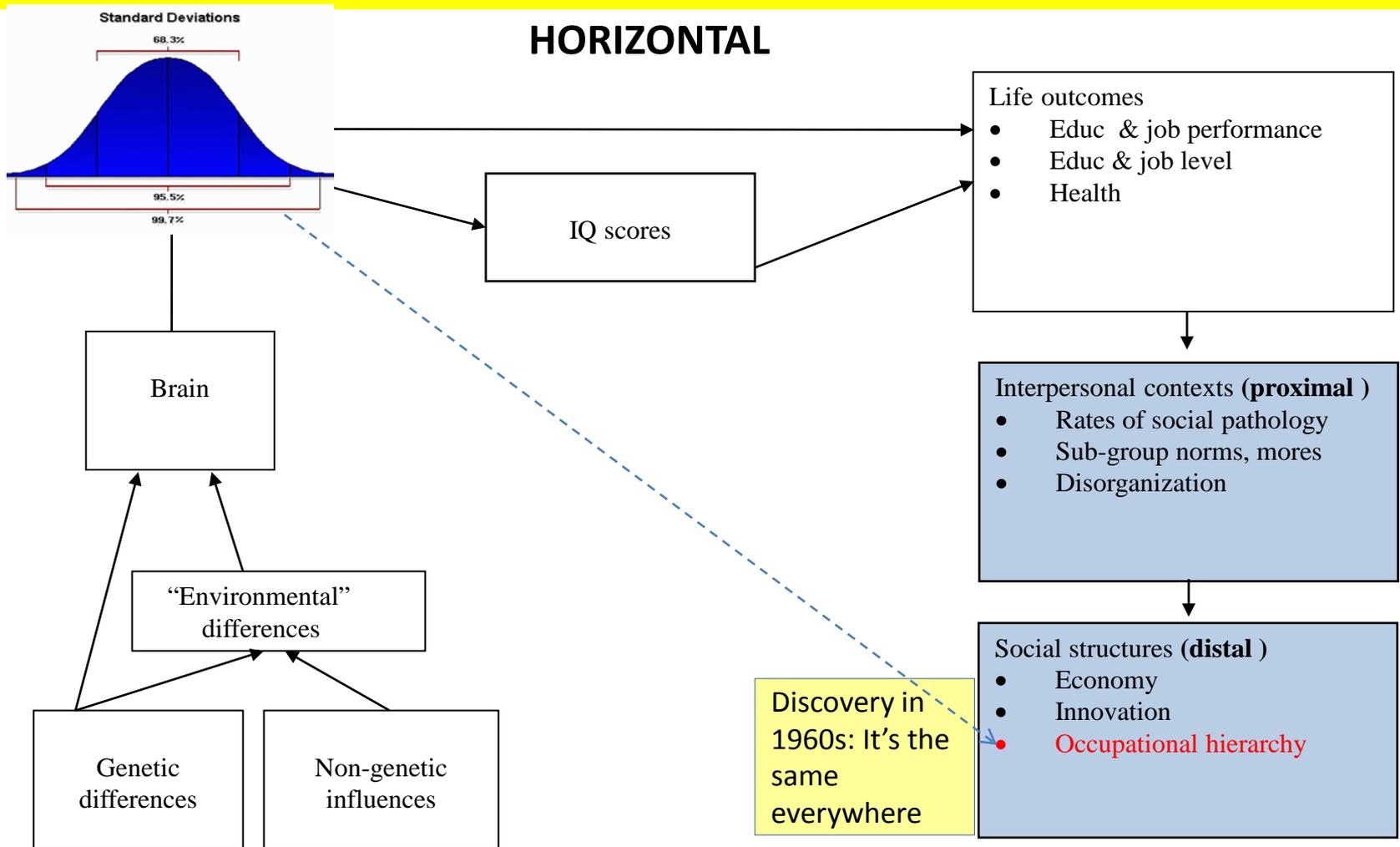
Social structures (**distal**)

- Economy
- Innovation
- Occupational hierarchy



Example 1

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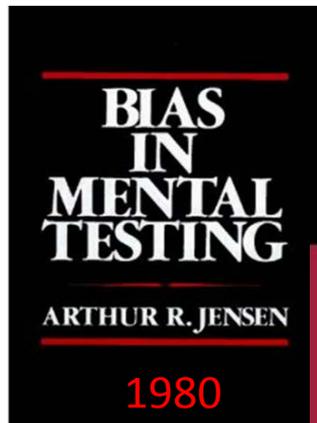


Intelligence in the 1980s—psychology

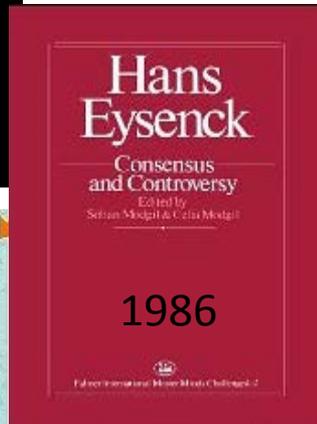
Rigorous but controversial

New journals

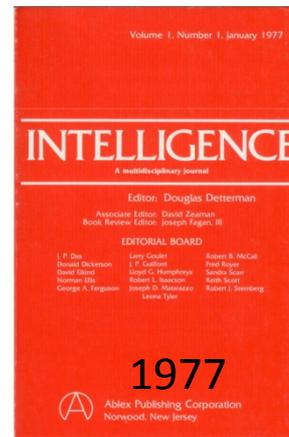
Popular denials of g



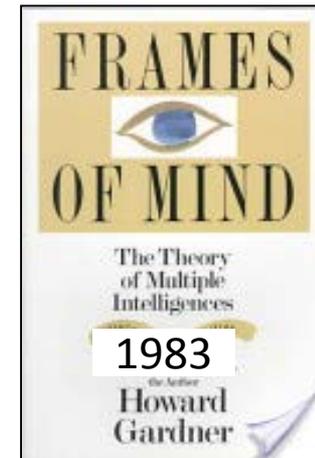
1980



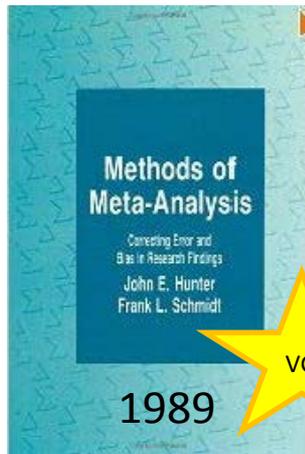
1986



1977



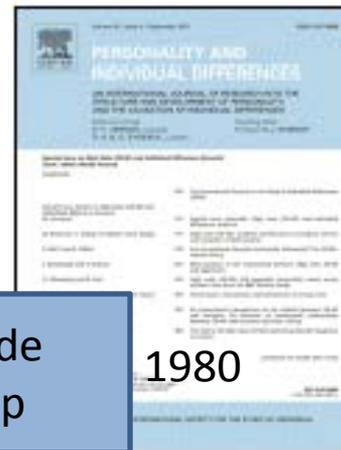
1983



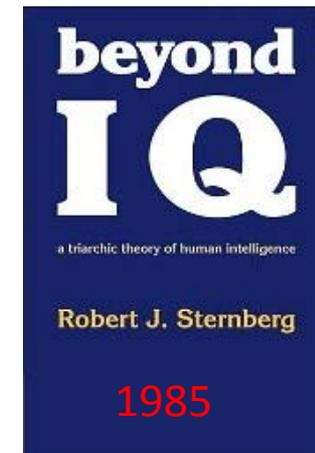
1989



1986 Aptitude patterns map



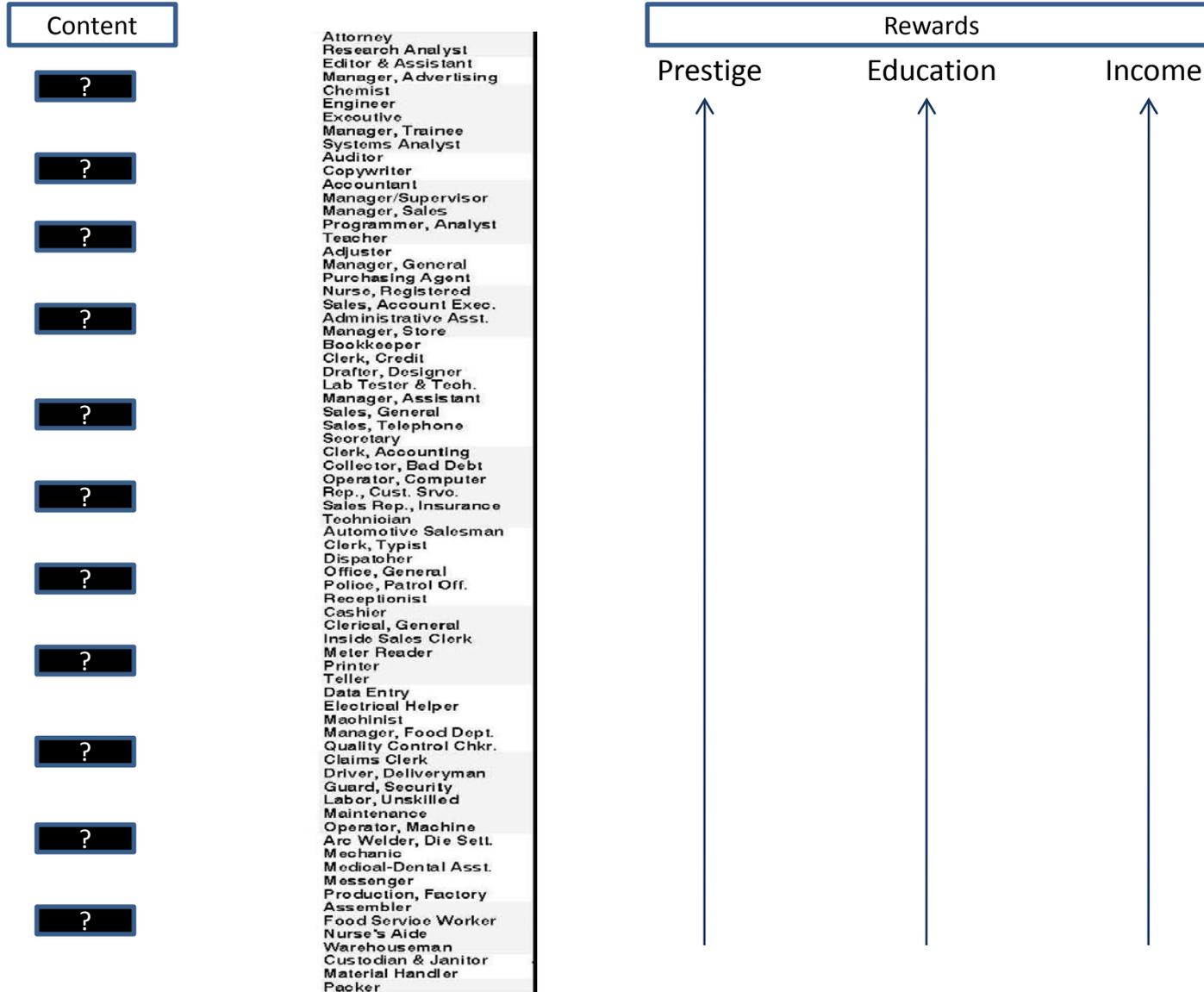
1980



1985

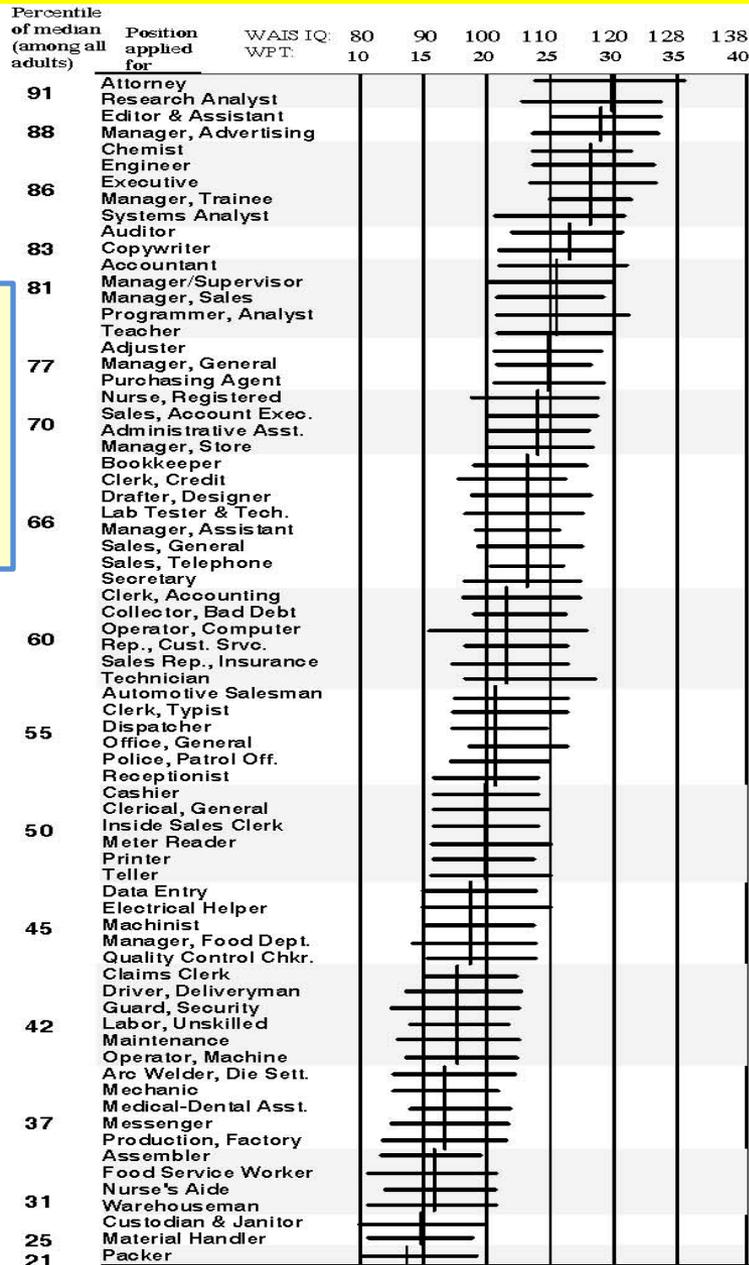


Sociological view of jobs





Prestige lines up best with workers' average IQ

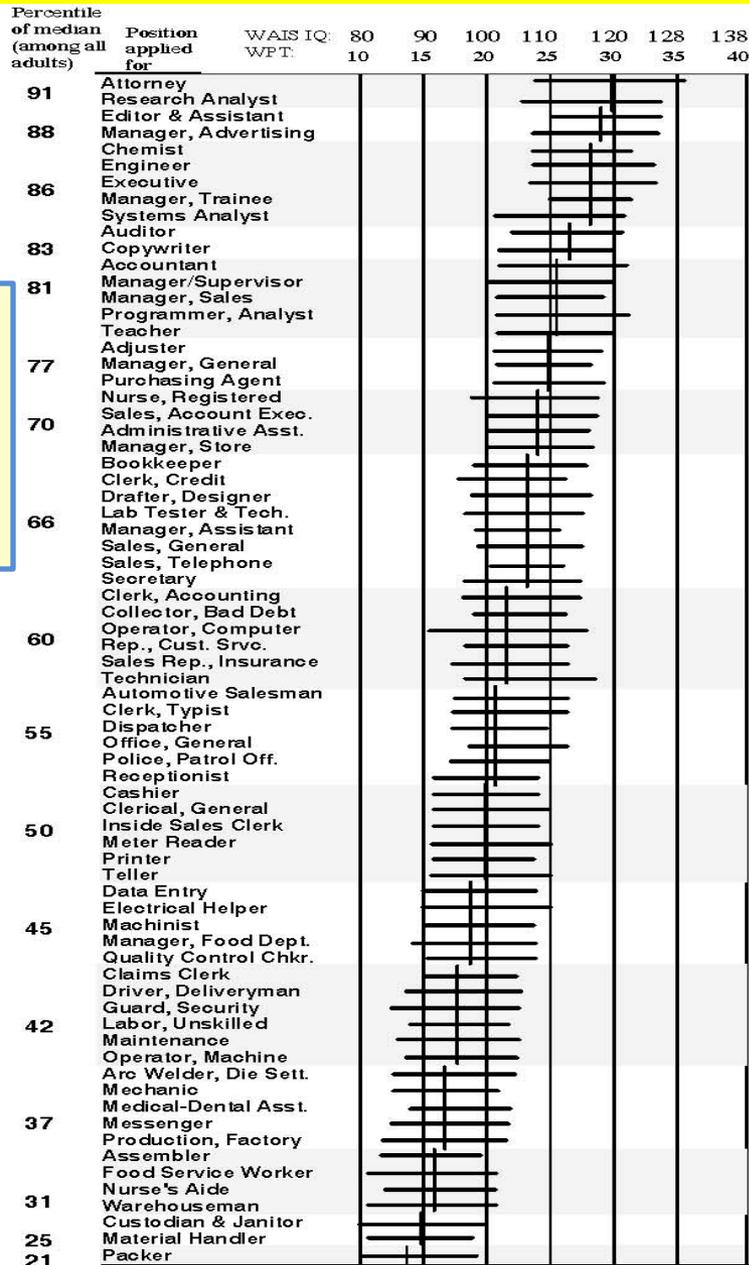


Workers' IQ average is higher

But do more prestigious occupations really need smarter workers?



Prestige lines up best with workers' average IQ



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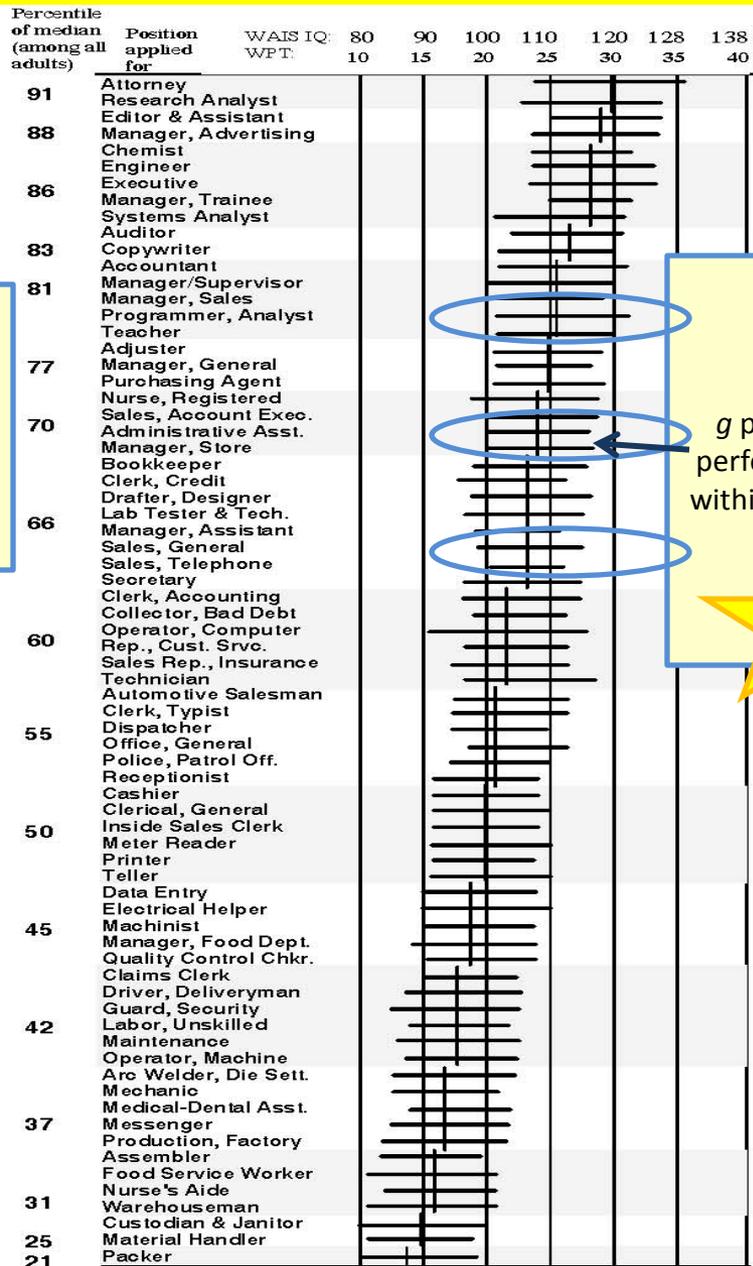
Sociology in 1970s

"No"

- Hierarchy based on power
- IQ = privilege, not merit
- ~All can master any job



Rebuttal—part 1



Workers' IQ average is higher

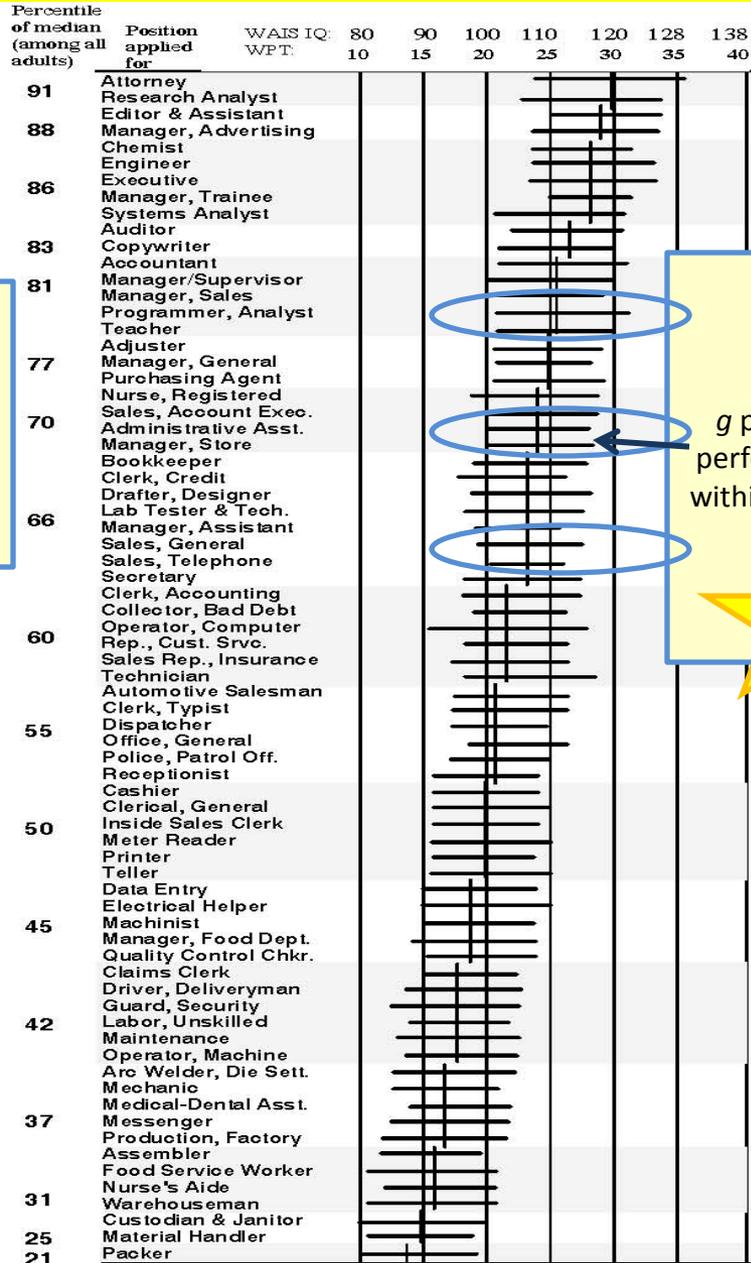
g predicts performance within all jobs

VG





Rebuttal—part 2

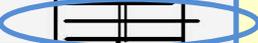
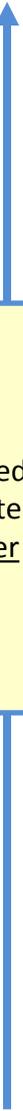


Workers' IQ average is higher

g predicts performance within all jobs

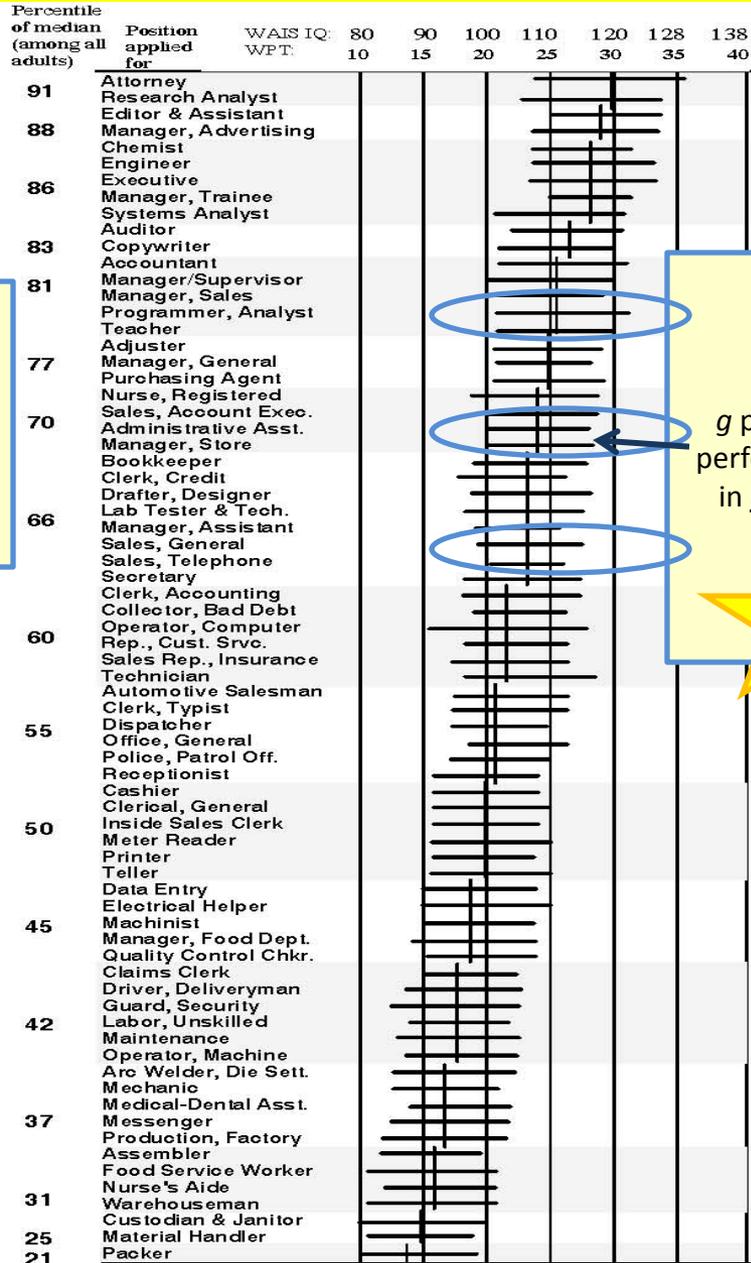
VG

g predicts better in higher jobs





Rebuttal—part 3



Workers' IQ average is higher

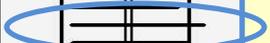
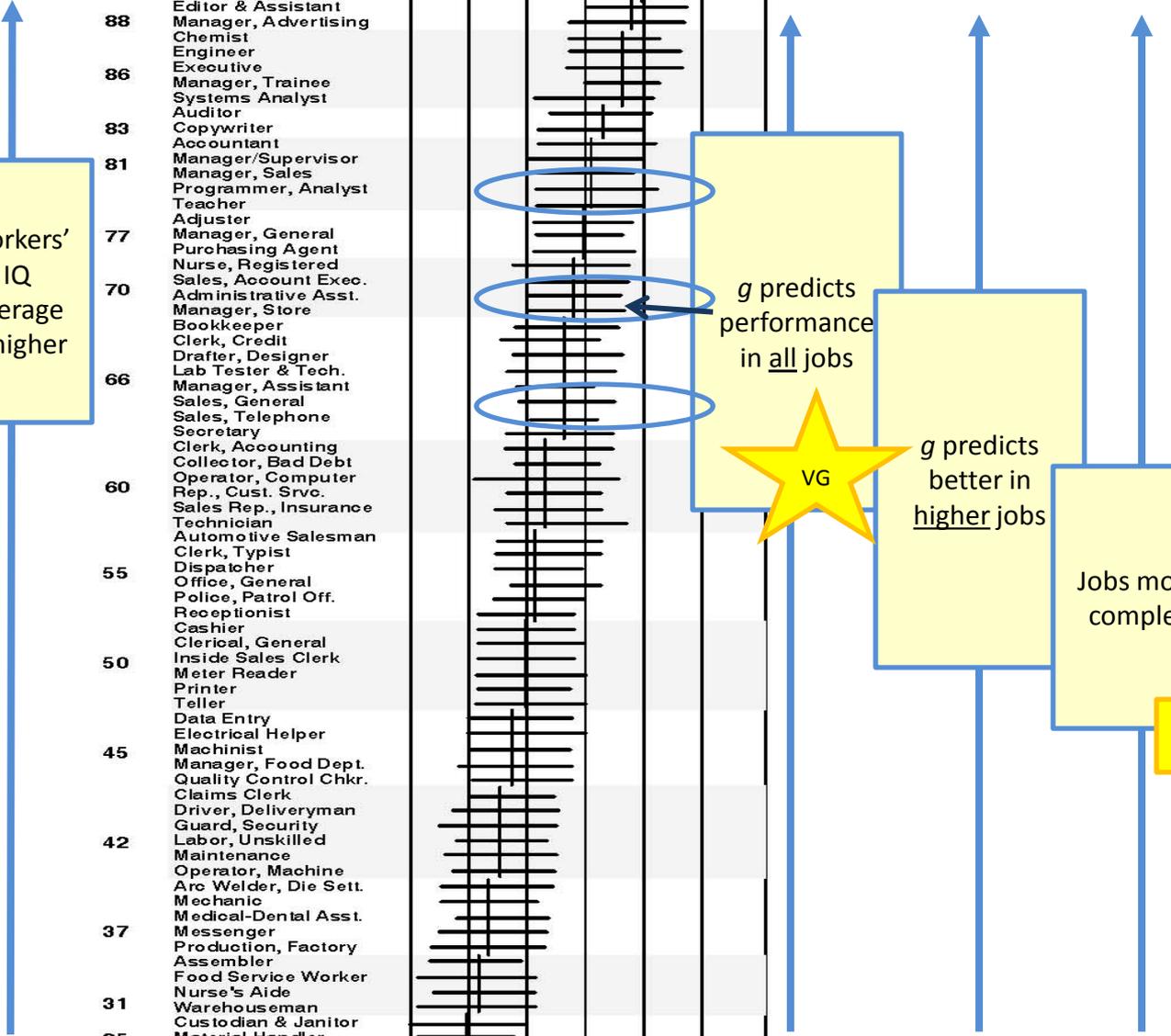
g predicts performance in all jobs

VG

g predicts better in higher jobs

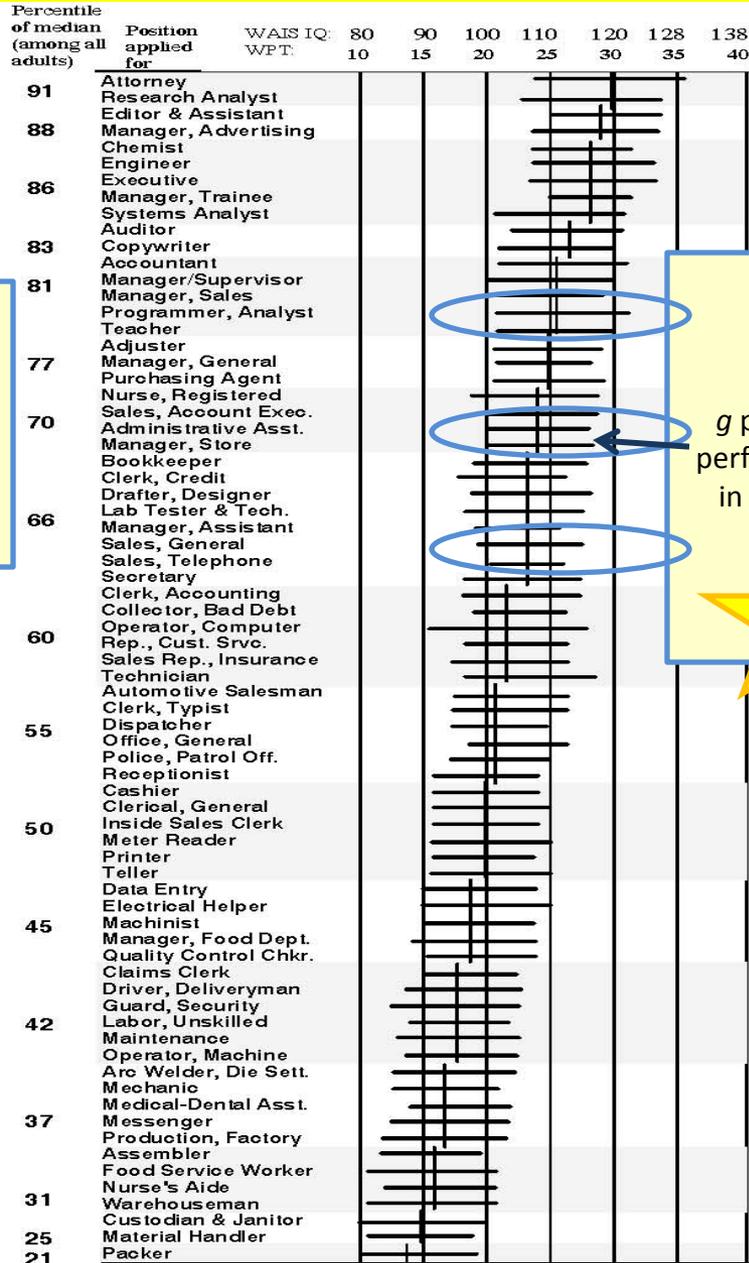
Jobs more complex

Job analysis





Rebuttal—part 3



Workers' IQ average is higher

g predicts performance in all jobs



g predicts better in higher jobs

Job complexity factor = Reasoning demands factor =

So –

1st factor among jobs mirrors 1st factor among people (g)

Jobs more complex

Job analysis

Why? Mechanism??



How many jobs in the Pleistocene?

Ache Hunter



Ache hunter on a forest trek in 1982 listens for monkeys.

Gatherer

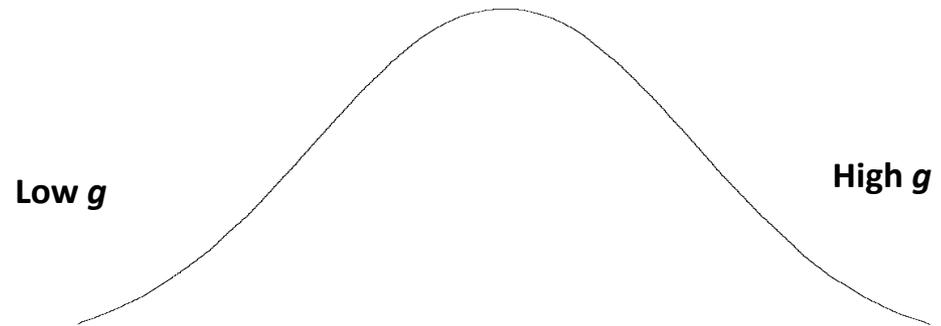


An Ache girl of twenty months in 1980 suckles while her mother makes a palm mat.



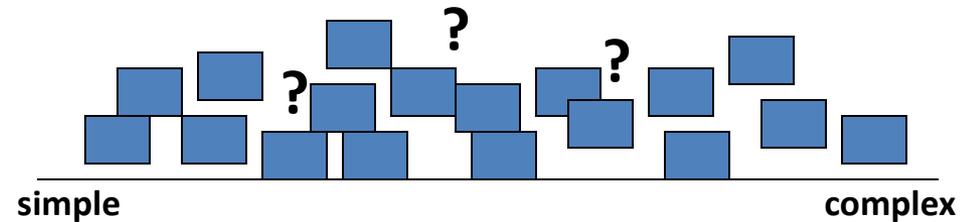
Two populations engage

1. Human population (fixed)



2. Task population (fluid)

3. Ceaseless (re)sorting



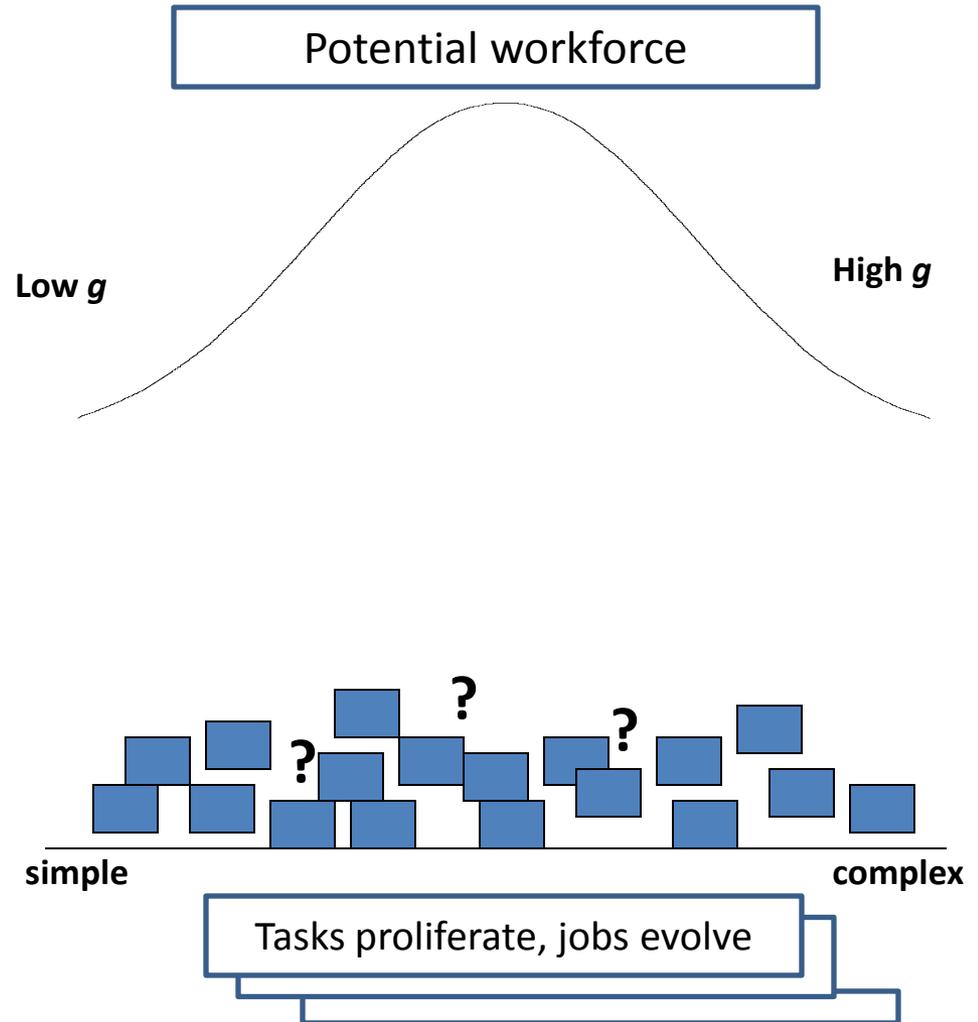


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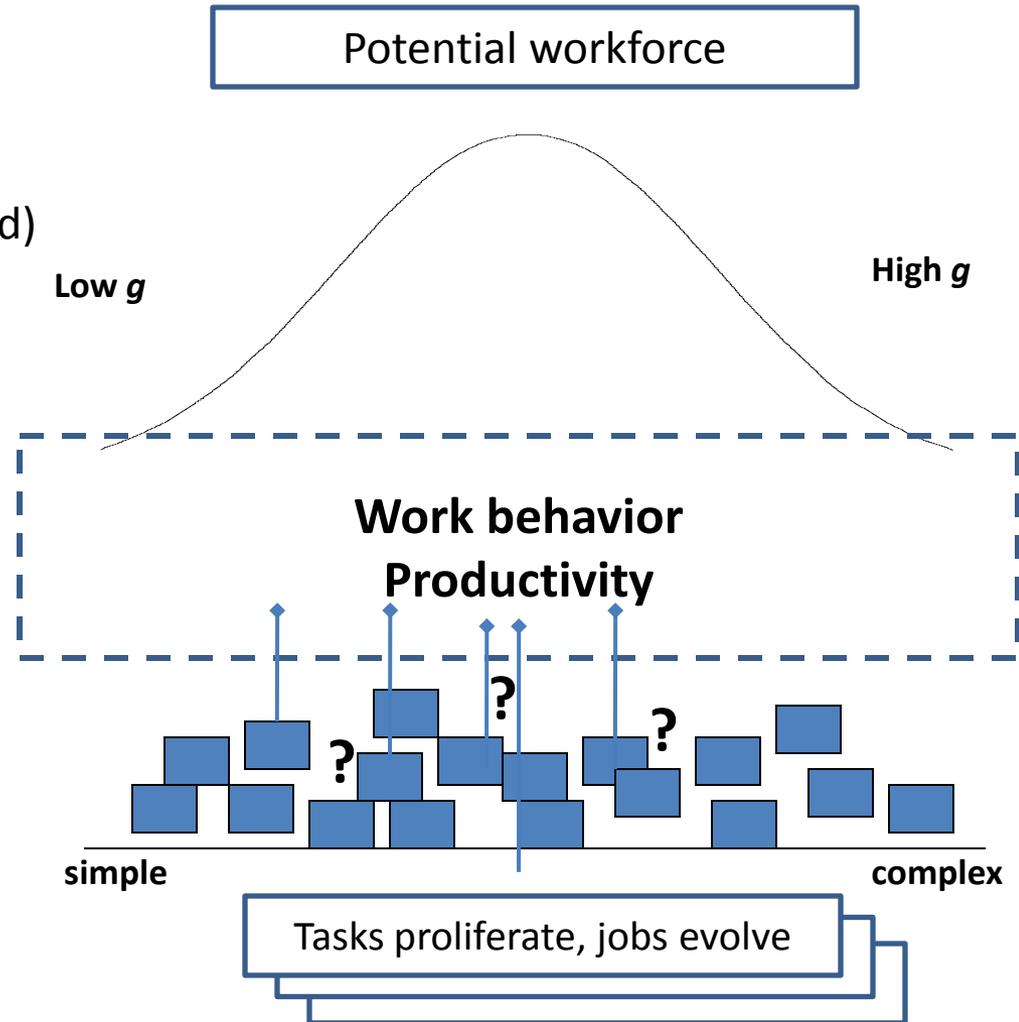


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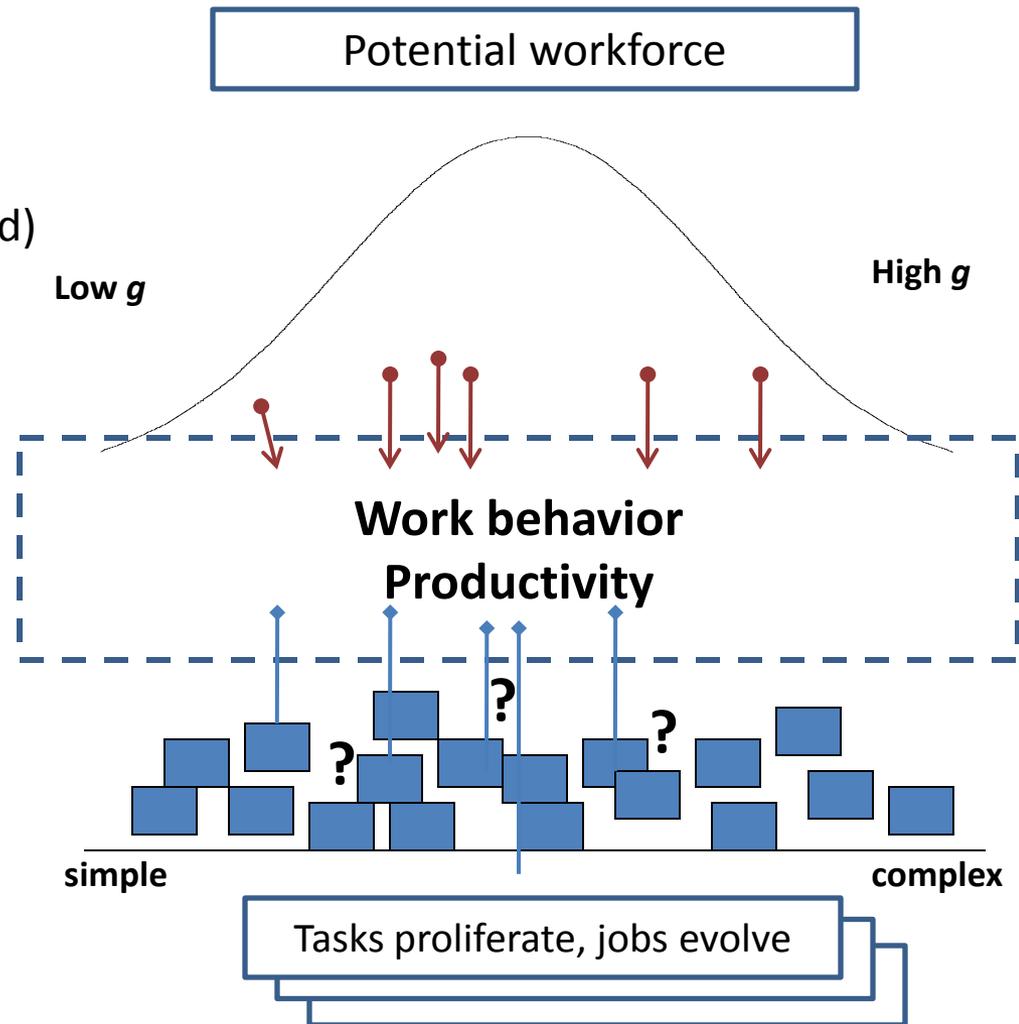


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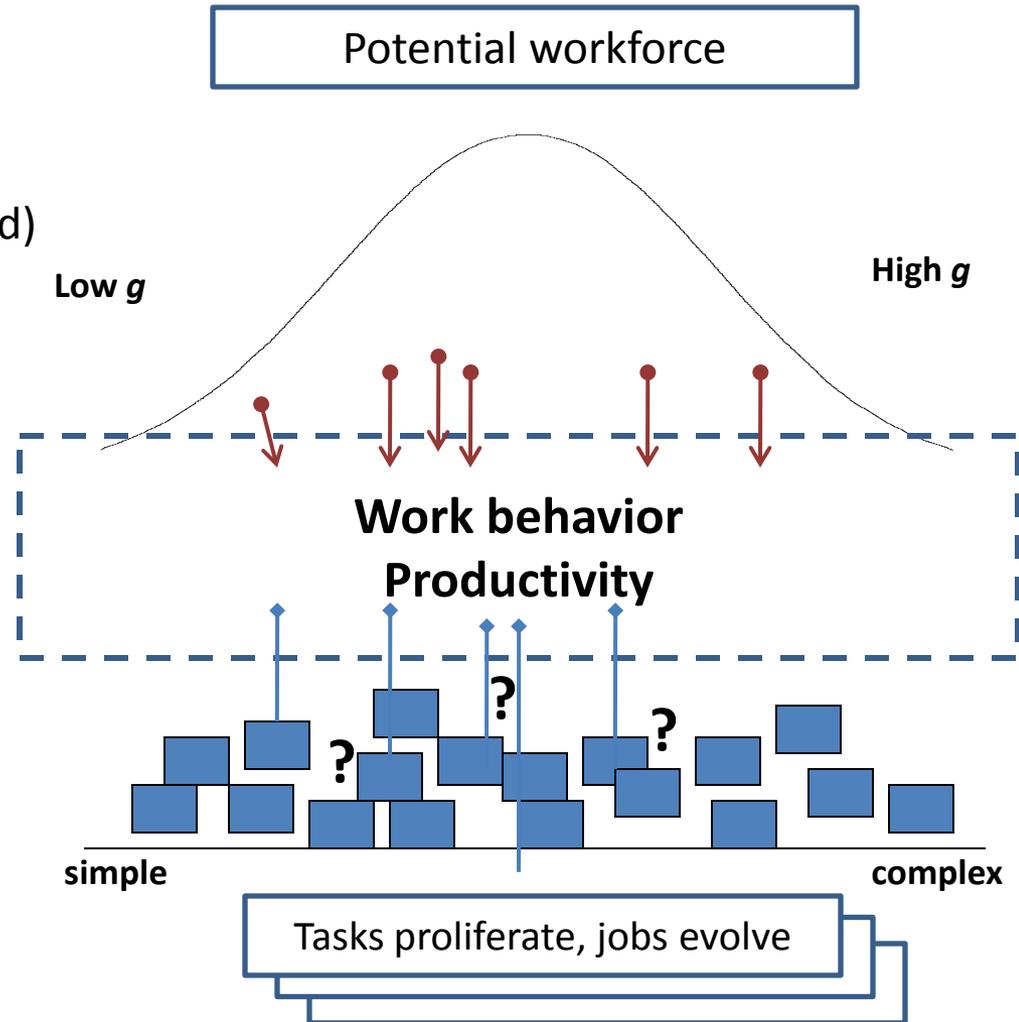
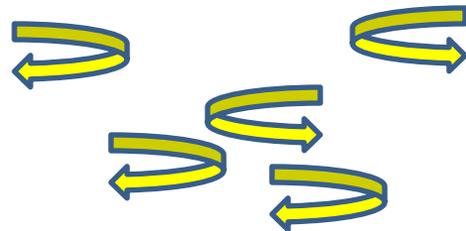


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The task heuristic

- Humans generate instrumental tasks
- Tasks evoke performance differences
- Myriad tweaks in who does what
- Toward higher g-e correlation
- Occupational hierarchy is human's extended phenotype



Example 2—the 1990s

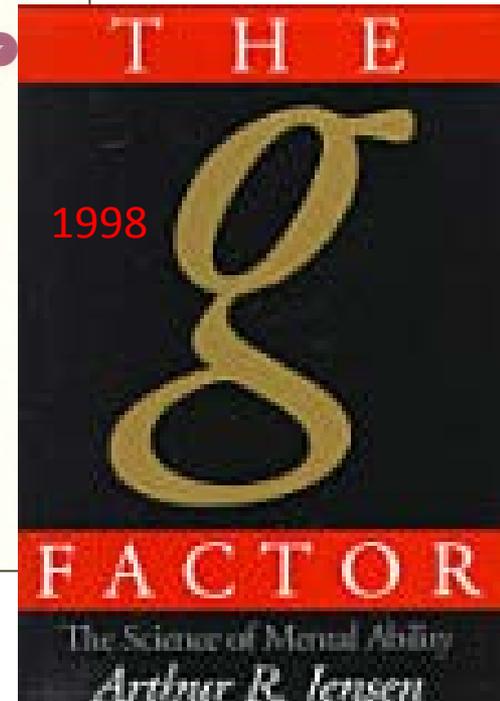
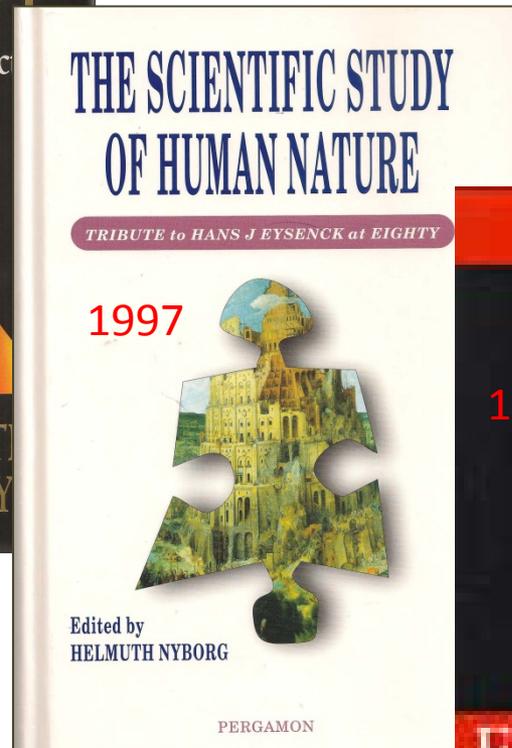
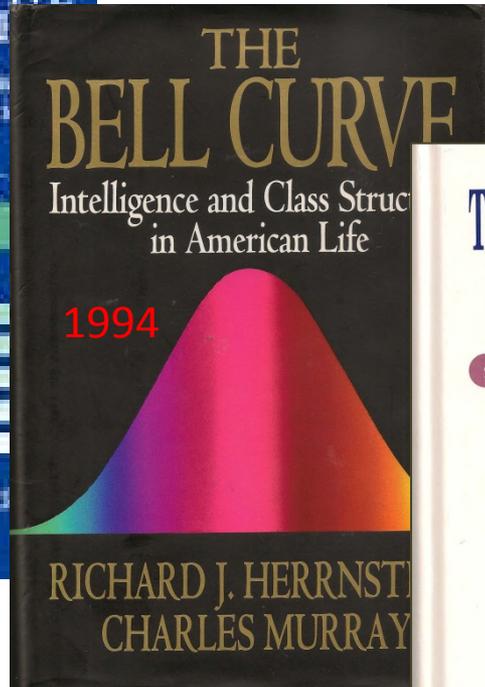
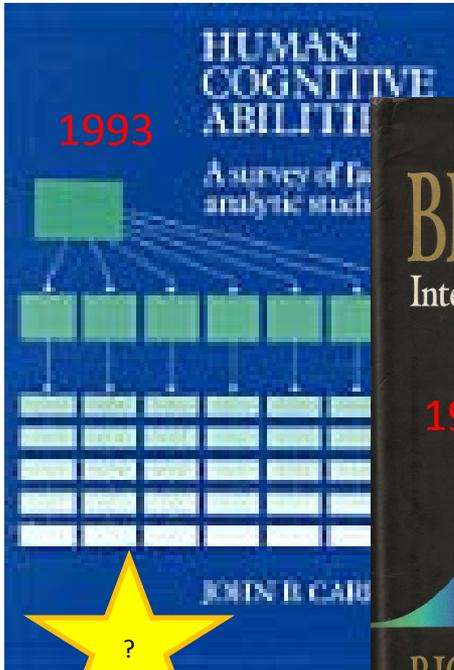


1990, London School comes to Manhattan





Intelligence in the 1990s



1997 "Why g matters"



What is _____ ?

- Ability:

“the possible variations over individuals in the liminal [threshold] levels of task difficulty ...at which, on any given occasion in which all conditions appear favorable, individuals perform successfully on a defined class of tasks”

- Task:

“any activity in which a person engages, given an appropriate setting, in order to achieve a specifiable class of objectives, final results, or terminal states of affairs”

- Cognitive task:

“any task in which correct or appropriate processing of mental information is critical to successful performance”

Carroll (1993)



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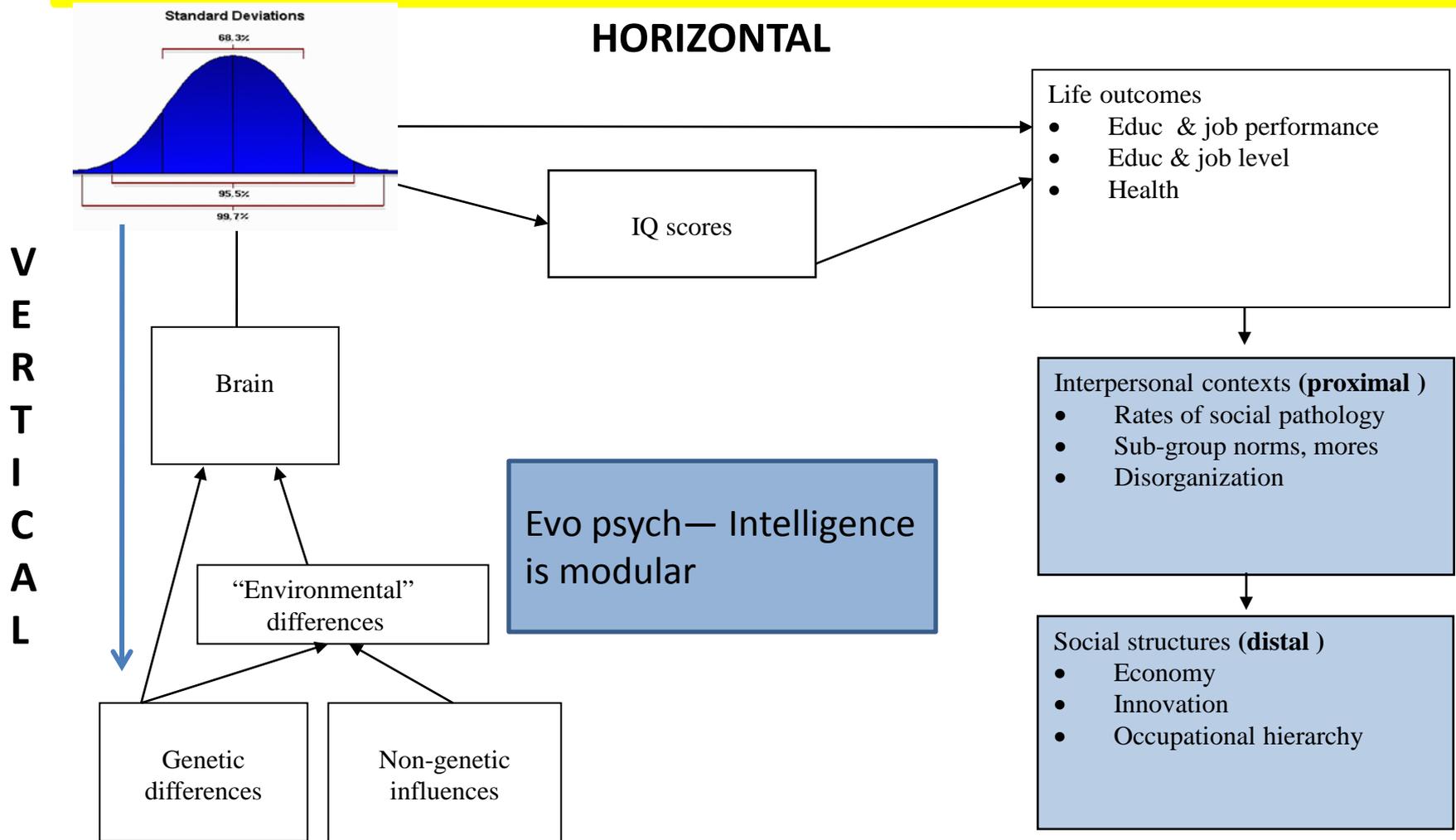
“any task in which correct or appropriate processing of mental information is critical to successful performance”

Carroll (1993)

Ability = behavior in response to task stimuli



Example 2



Could a general intelligence have evolved?

- Some evo psych—“no”
 - Modular brain
 - Specific heuristics for specific needs

But it did evolve



Could a general intelligence have evolved?

- Some evo psych—“no”
 - Modular brain
 - Specific heuristics for specific needs

But it did evolve

- Other evo psych—“yes”
 - “Mating mind”
 - “Social brain”

But *g* is instrumental, not social

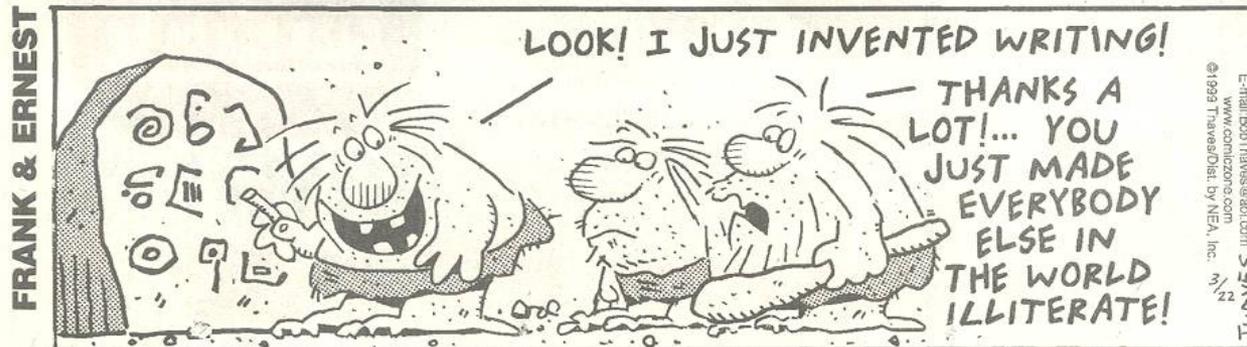


Challenge

- g is general
- What selection pressure was equally general and unique to humans?

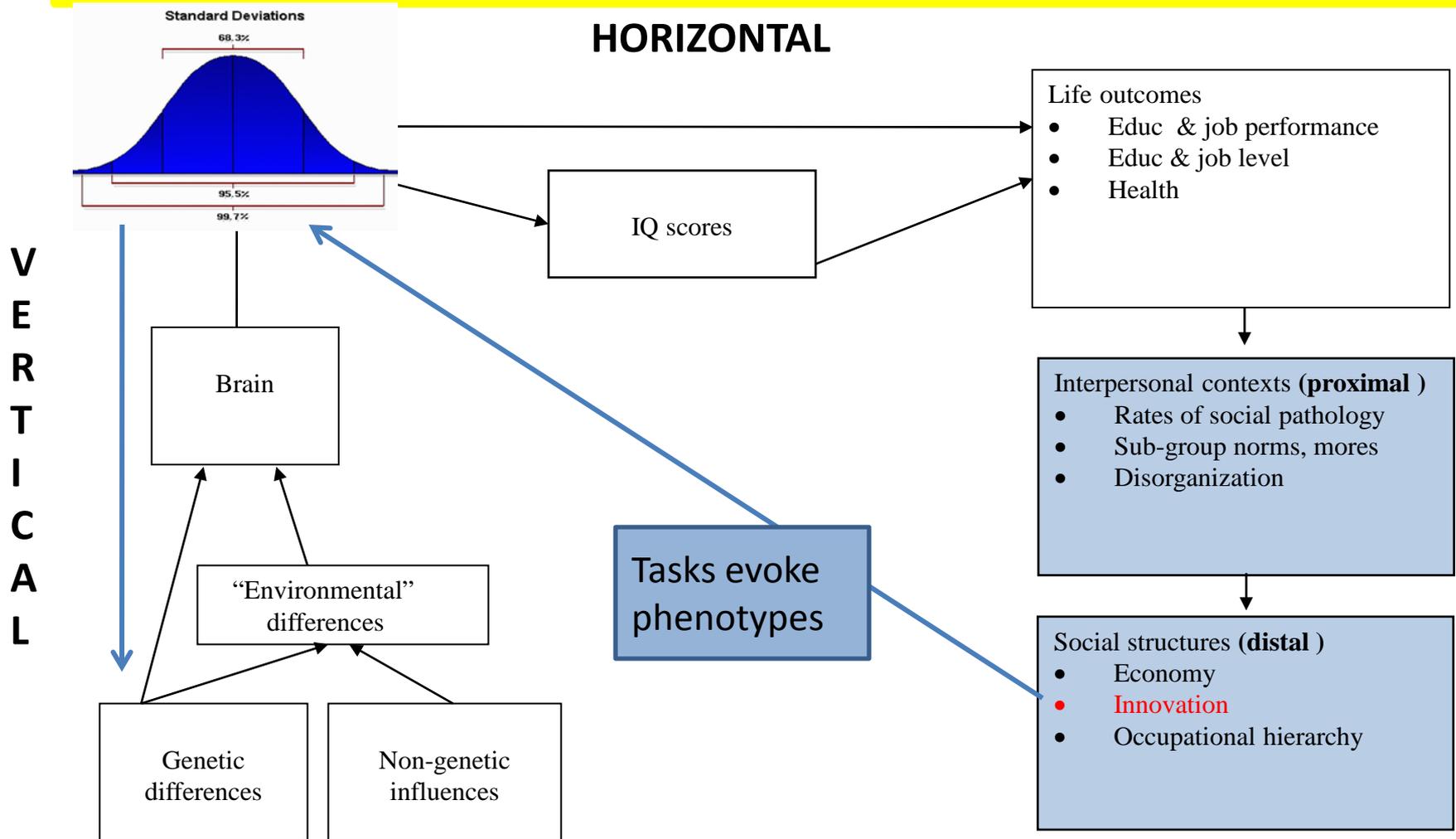
Hypothesis

- Human innovation
 - Novel tasks
 - Novel hazards
 - Relative risk steepens





Example 2

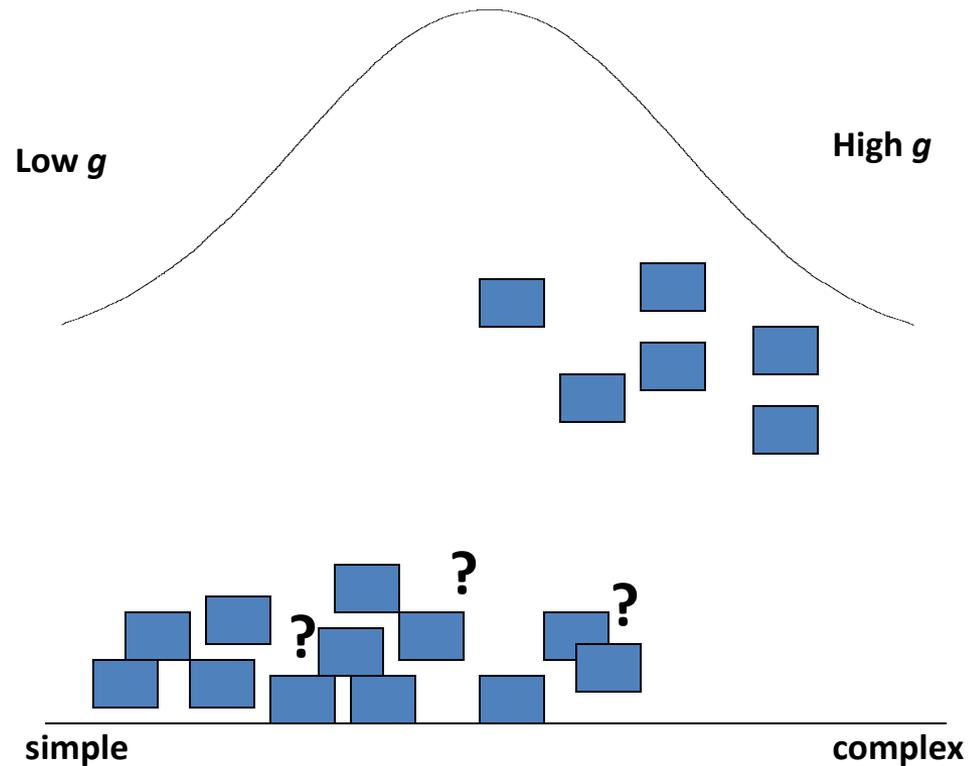




Innovators generate novel tools & tasks

1. Human population (fixed)

2. Task population (fluid)



Novel = complex

Novel = risk of error & injury (fire, cuts, collisions)



% of civilian deaths

	USA (1986)				Ache (<1971)		
Age:	15-24	25-34	35-44	45-64	0-3	4-14	15-59
Illness	22	44	72	93	50	35	49
Accident	51	31	15	4	3	25	37
Suicide	13	12	7	2	0	0	0
Homicide	14	13	6	1	47	40	14



% of civilian deaths

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Drowning
Firearms
Vehicles
Lightning

Cut/pierced
Caught/crushed
Falling object
Machines

FIRE

Snake bite
Drowned
Lightning
Got lost

Snake bite
Falling object
Lightning
Jaguar

All preventable using "mind's eye"



% of civilian deaths

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Snake bite
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Got lost

Snake bite
Falling object
Lightning
Jaguar

Hi relative risk by SES & male

Parent(s) died

Hazards of daily life

83



ROSPA

The Royal Society for the Prevention of Accidents, Royal Oak Centre, Brighton Road, Pulley, Surrey CR2 2UR

HS CP9

Preventing accidents = cognitive process
 “Keeping systems under control”

Task clues from job analysis

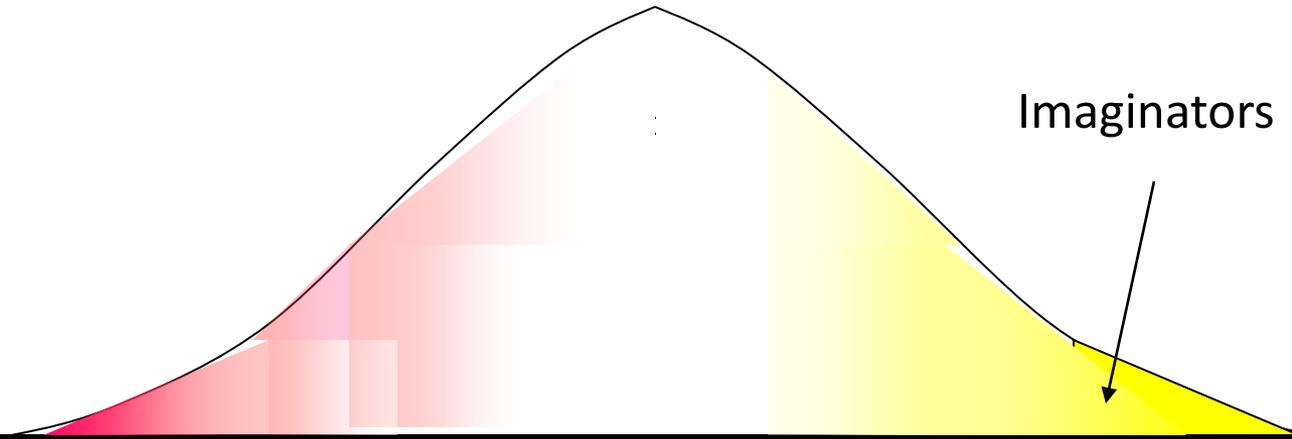
“Judgment & Reasoning Factor” (1st factor)

- Deal with unexpected situations
- Learn & recall job-related information
- Reason & make judgments
- Identify problem situations quickly
- React swiftly when unexpected problems occur
- Apply common sense to solve problems

None of these is domain-specific.

Selection walk?

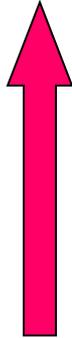
Illustration



Imaginators

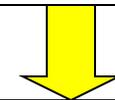
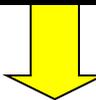


Relative risk steepens



Innovate to adapt to harsher climates:

- clothing, shelter
- storage, preservation



Bigger consequences ← More hazards ← More complexity ← More innovations



Ecological pressure?

Not the obvious

- Starvation, harsh climate
- Because *g*-based benefits shared—meat from hunting, shelter

But the “minor” side-effects of core tasks

- “Accidental” injury—the myriad low-probability, chance-laden, oft-ignored hazards in daily chores
- Because their *g*-based costs not shared

Lesson—

Hazards are unobtrusive tests

Not avoided if not seen

Not seen if weak “mind’s eye”



Simpler life \neq g -proof environment

- Opportunity to learn & reason + within-group *variation* in g = opportunity for selection
- Tiny effect size + many generations = big shift in distribution

Example 3—Health disparities

- Same principles
 - Task requirements
 - Mind’s eye to recognize them
 - Aggregate small risks
- Applied to health self-care
 - Diabetes self-management

Current models of health disparities



Assumption:

Disparities can be traced to social inequalities

Current models of health disparities



Assumption:

Disparities can be traced to social inequalities

Unique challenge:

How does inequality “get under the skin”?

Current models of health disparities



Assumption:

Disparities can be traced to social inequalities

Unique challenge:

How does inequality “get under the skin”?

Usual constraint:

No traits

Behavior not genetic

How does inequality kill?



Diabetes self-management

- A complex “job”
- Unwanted
- Little training
- Little supervision
- Little feedback
- Much non-adherence



Job description

- **Learn about diabetes in general (At “entry”)**
 - Physiological process
 - Interdependence of diet, exercise, meds
 - Symptoms & corrective action
 - Consequences of poor control
- **Apply knowledge to own case (Daily, Hourly)**
 - Implement appropriate regimen
 - Continuously monitor physical signs
 - Diagnose problems in timely manner
 - Adjust food, exercise, meds in timely and appropriate manner
- **Coordinate with relevant parties (Frequently)**
 - Negotiate changes in activities with family, friends, job
 - Enlist/capitalize on social support
 - Communicate status and needs to practitioners
- **Update knowledge & adjust regimen (Occasionally)**
 - When other chronic conditions or disabilities develop
 - When new treatments available
 - When life circumstances change

Self-management



Mimics accident prevention process

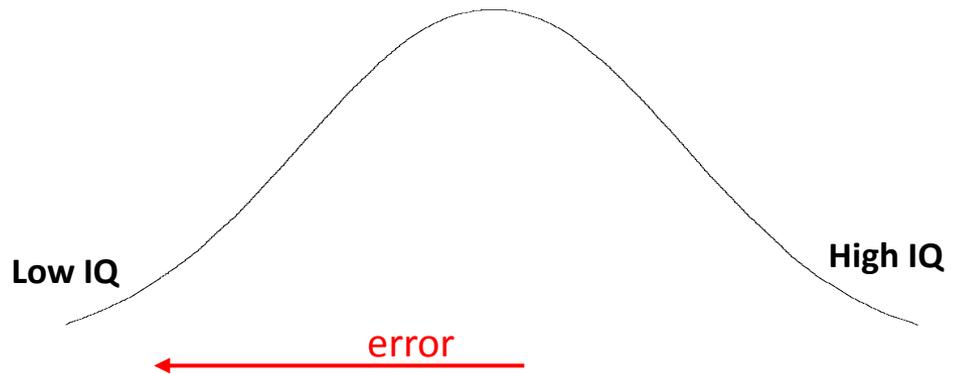
- Not mechanically following a recipe
- Task—keep complex system under control in often unpredictable circumstances
- Goal—prevent complications
- Performance measures—what doesn't develop
 - Blindness
 - Amputations
 - Kidney failure
 - Heart attack

Tremendous need for mind's eye



Relative risk generator

1. Patients differ in cognitive ability (IQ/ g)

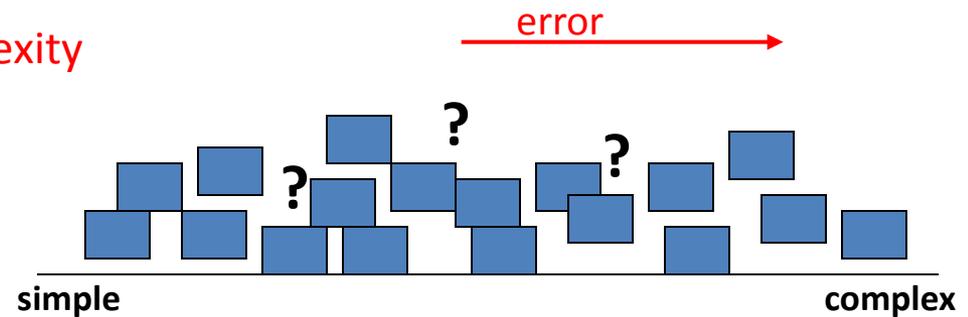


3. Error rates

(non-adherence)

- rise at lower IQ
- rise with complexity

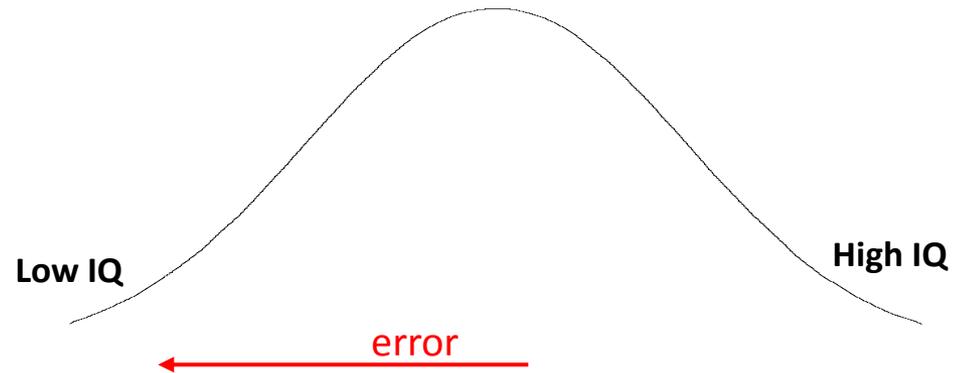
2. Health tasks differ in complexity (g loading)





Relative risk steepens when self-care more complex

1. Patients differ in cognitive ability (IQ/ g)

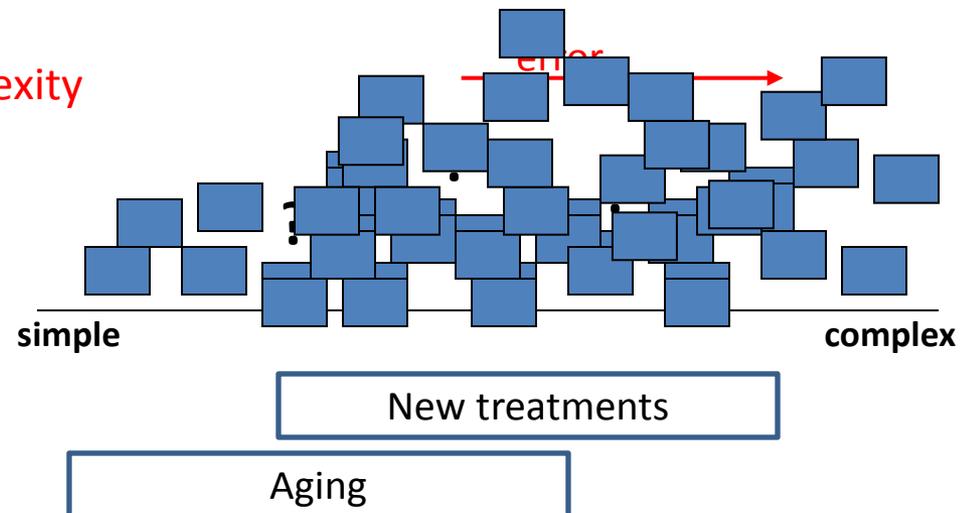


3. Error rates

(non-adherence)

- rise at lower IQ
- rise with complexity

2. Health tasks differ in complexity (g loading)



Practical implications?

- Cannot eradicate *g*-based disparities without
 - Extreme state coercion
 - To redistribute resources
 - To create negative gene-environment correlations
- Cannot level differences in patient “literacy”
- But can husband their cognitive resources

Collaborative project in Delaware

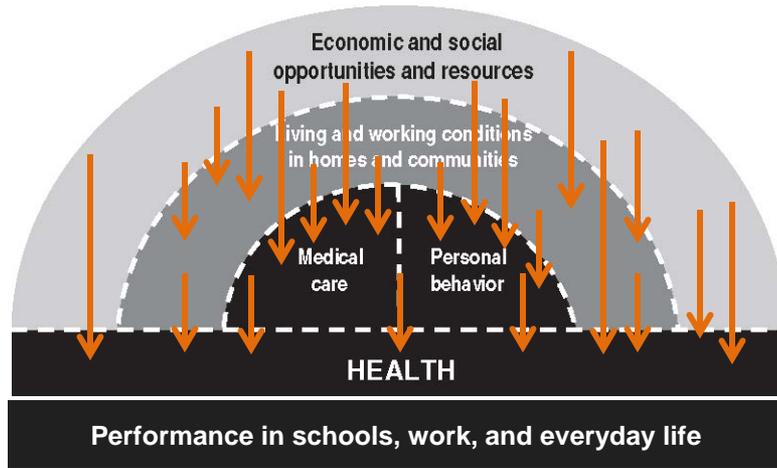
1. Audit self-management tasks (provider survey)
 - Rank by criticality
 - Rank by difficulty of learning
 - Examples of critical patient errors



2. Identify cognitive hurdles in self-care (patient focus groups)
3. Design a job ladder, from novice to expert (prioritize/triage tasks)
4. Redesign training (for greater cognitively accessibility)

Access to care isn't enough—effectively exploiting it is also required

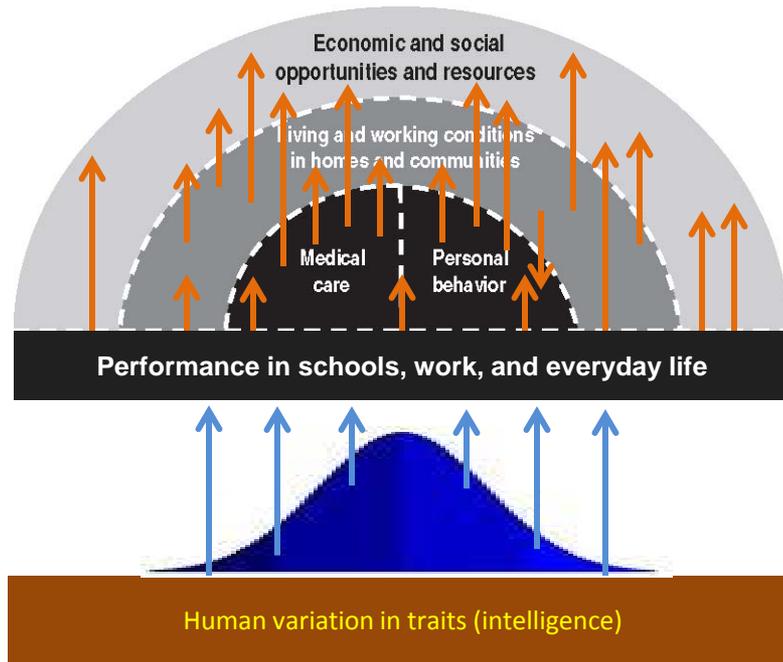
Non-biological sociology



Limited value



Biological Sociology



Intelligence: A New Look

Thank you