

Cognitive Disparities: What Role in Creating Health Disparities?

Linda S. Gottfredson, PhD

*Presenter in Book Event, “The Health Disparities Myth:
Diagnosing the Treatment Gap”*

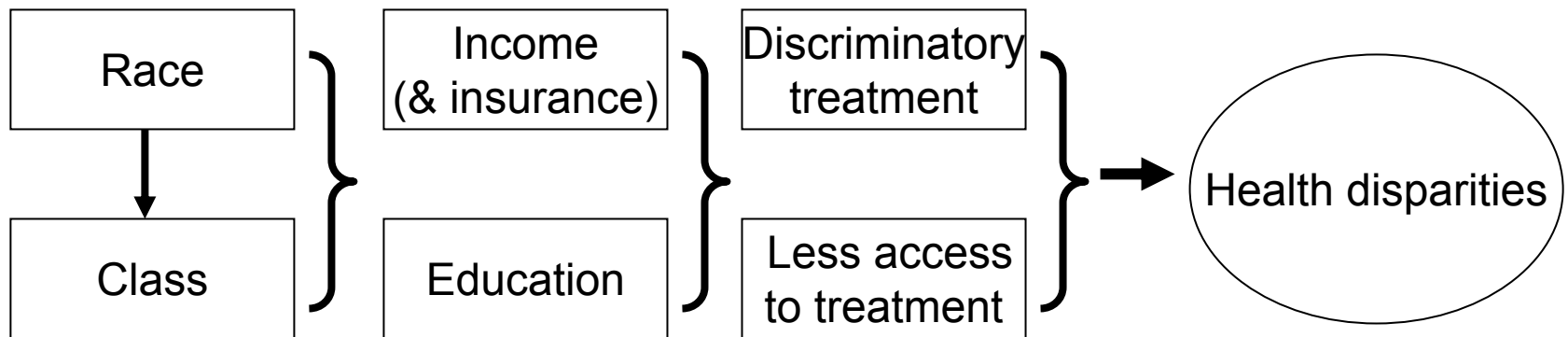
American Enterprise Institute, Washington DC

February 22, 2006

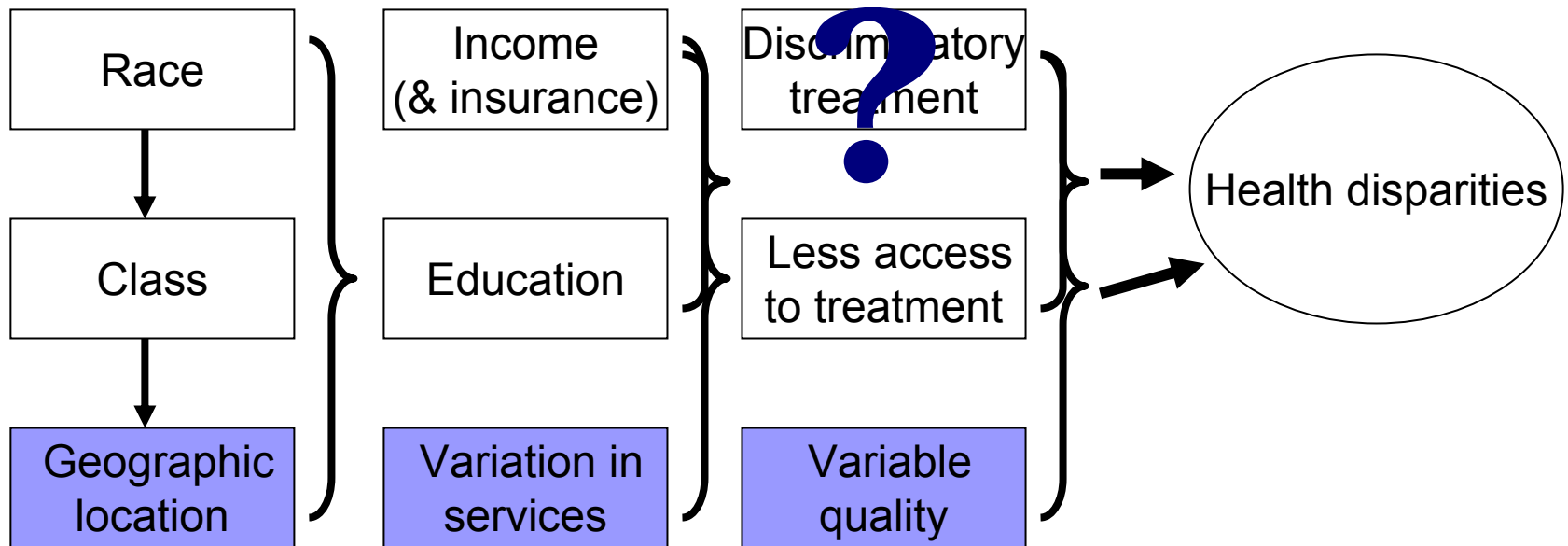
Today, I Will—

- Agree—more plausible explanations for health disparities than treatment bias
- Amplify—patient-side factors include general reasoning ability (*g* factor)
- Describe—how this information can improve health & save lives

Standard Disparities Model



Klick & Satel's First "3rd Variable"



Patient attributes also matter

Cannot assume that differences = discrimination.
There is a plausible alternative explanation.

Patients' Central Role

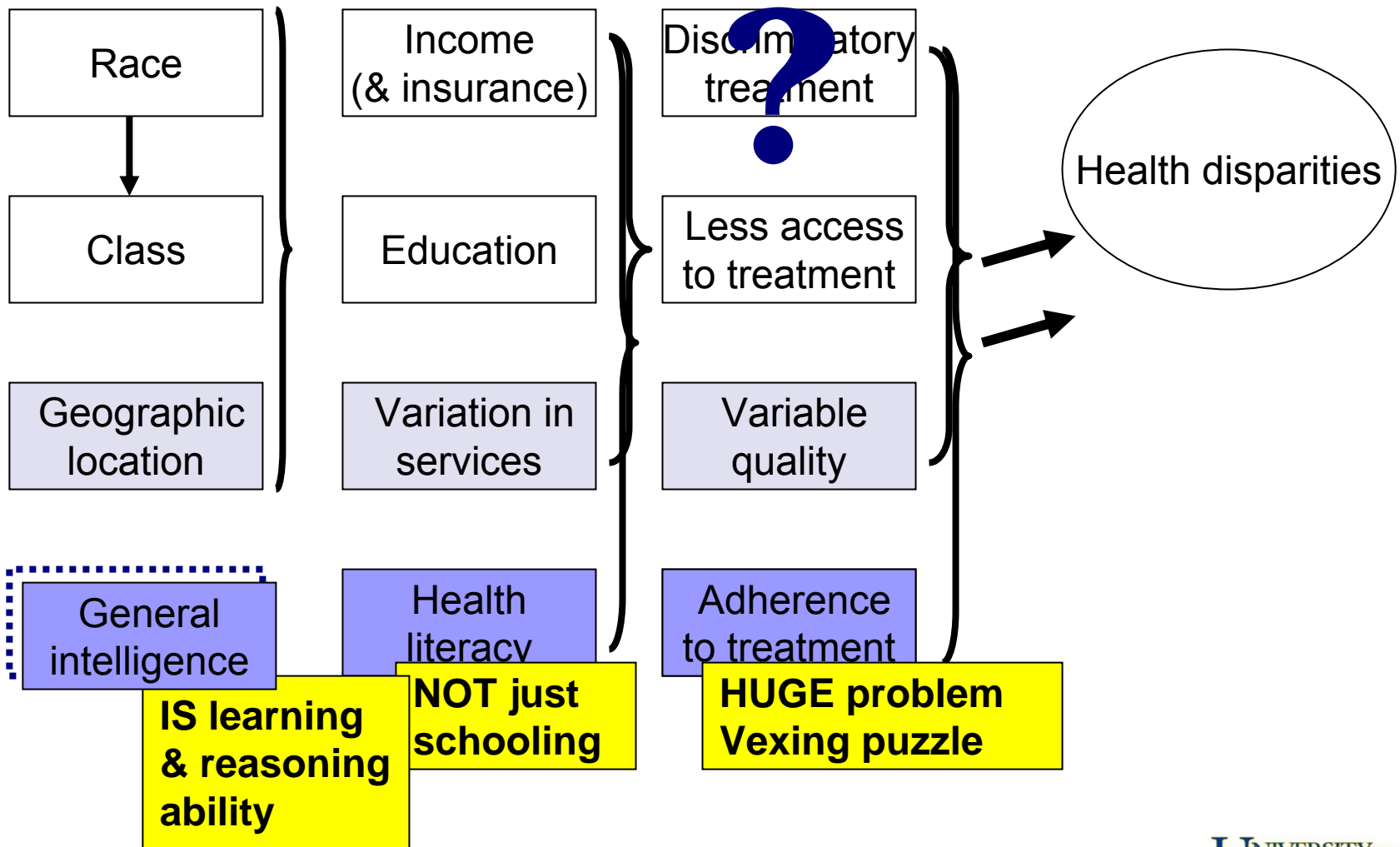
We are our own “primary health care providers”

- Lifetime self-care is key to good health—prevent disease & injury, manage daily treatment
- Is a complex job requiring much independent judgment
- People differ greatly in how effectively they use preventive & curative resources available to them

Therefore, identical treatment does not produce same results

- Equalizing access and quality of health care does not—cannot—equalize health
 - Introduction of national health care in Britain increased class disparities in health
- General rule in education too
 - Interventions that improve the average also increase the variance

Faulty Self-Care



Practical Importance of Literacy

- Patients examine the actual vials or documents

% of urban hospital outpatients <i>not</i> knowing	Health literacy level		
	V-low	Low	OK
<div style="background-color: #e0e0ff; padding: 5px; display: inline-block;"> Many professionals have no idea how difficult these “simple” things are for others </div>			
How to take meds 4 times per day	24	9	5
When next appointment is scheduled	40	13	5
How many pills of a prescription to take	70	34	13
What an informed consent form is saying	95	72	22

Insulin-Dependent Diabetics

And these are their <i>simplest</i> tasks	Health literacy level		
	V-low	Low	OK
Signal: Thirsty/tired/weak usually means <u>blood sugar too high</u> →	40	31	25
Action: Exercise lowers blood sugar →	60	54	35
Signal: ... usually r	50	15	6
Action: ...		46	27

But how typical are these individuals?

National Literacy Survey

- Items simulate everyday health tasks
- Analyzed what increases item difficulty (error rates)
- Gives scores by race, education, age, income, etc

Sample item

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Pediatric Dosage Chart Drops, Syrup, & Chewables

Age	Approximate Weight Range*	Dosage			
		Drops	Syrup	Chewables 80 mg	Chewables 160 mg
† Under 3 mo	Under 13 lb	½ dropper	¼ tsp	—	—
† 3 to 9 mo	13-20 lb	1 dropper	½ tsp	—	—
† 10 to 24 mo	21-26 lb	1 ½ droppers	¾ tsp	—	—
2 to 3 yr	27-35 lb	2 droppers	1 tsp	2 tablets	—
4 to 5 yr	36-43 lb	3 droppers	1 ½ tsp	3 tablets	1 ½ tablets
6 to 8 yr	44-62 lb	—	2 tsp	4 tablets	2 tablets
9 to 10 yr	63-79 lb	—	2 ½ tsp	5 tablets	2 ½ tablets
11 yr	80-89 lb	—	3 tsp	6 tablets	3 tablets
12 yr and older	90 lb & over	—	3-4 tsp	6-8 tablets	3-4 tablets

† Consult with physician before administering to children under the age of 2 years.
Dosage may be given every 4 hours as needed but not more than 5 times daily.

How Supplied:

Drops: Each 0.8 ml dropper contains 80 mg (1.23 grains) acetaminophen.

Syrup: Each 5 ml teaspoon contains 160 mg (2.46 grains) acetaminophen.

Chewables: Regular tablets contain 80 mg (1.23 grains) acetaminophen each. Double strength tablets contain 160 mg (2.46 grains) acetaminophen each.

* If child is significantly under- or overweight, dosage may need to be adjusted accordingly.

The weight categories in this chart are designed to approximate effective dose ranges of 10-15 milligrams per kilogram. (Current Pediatric Diagnosis and Treatment, 8th ed. CH Kempe and HK Silver, ed. Lange Medical Publications: 1984, p. 1079) LA-1451-2-88 © 1988, Bristol-Myers U.S. Pharmaceutical and Nutritional Group • Evansville, Indiana 47721 U.S.A.

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#1—Underline sentence saying how often to administer medication

Pediatric Dosage Chart



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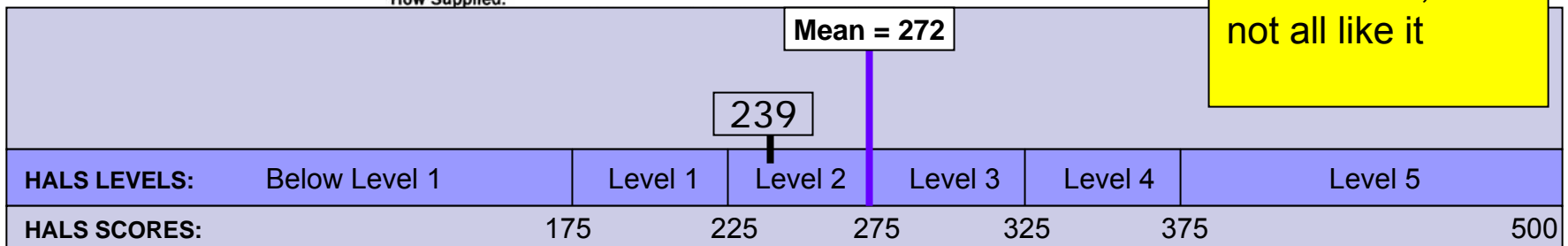
How Supplied:

- One piece of info
- Simple match
- But lots of irrelevant info

% US adults routinely functioning below this level?

20%

Caution!
Could train them do this item, but not all like it



#2—How much syrup for 10-year-old who weighs 50 pounds?

Pediatric Dosage Chart

- Spot & reconcile conflicting info
- Inference from ambiguous info
- Multiple features to match

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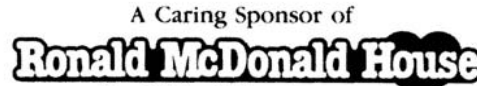
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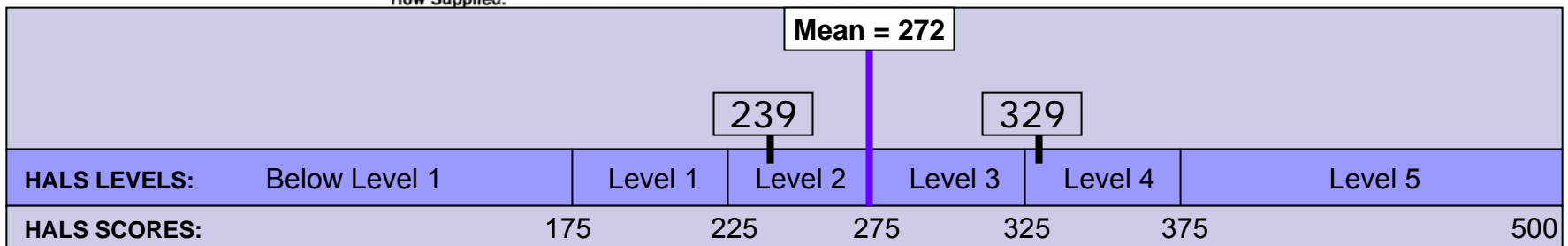
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 How Supplied:

- Spot & reconcile conflicting info
- Inference from ambiguous info
- Multiple features to match

% US adults routinely functioning below this level?

46%



#3—Your child is 11 years old and weighs 85 pounds. How many 80 mg tablets can you give in 24-hr period?

- Multiple features to match
- Two-step task
- Infer proper math operation
- Select proper numbers to use
- Ignore the most obvious but incorrect number
- Calculate the result

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% US adults routinely functioning below this level?

99%

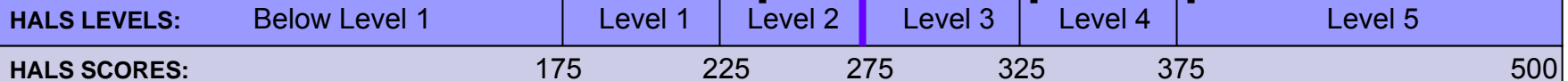
“Below minimum standard for today’s labor market”

Mean = 272

239

329

378



% at Each Literacy Level, By Race

NALS: College Degree

White	10	2	8	32	45	13
Black	37	8	29	44	16	2
Hispanic	34	9	25	37	25	4

NALS: High School Diploma or GED

White	49	11	38	41	12	1
Black	79	32	47	19	2	*
Hispanic	71	32	39	26	4	*

General finding in all studies of cognitive skills—
Blacks perform more like whites 3-4 grades below
(with Hispanics not quite as far below)

HALS LEVELS:	Below Level 1	Level 1	Level 2	Level 3	Level 4	Level 5
HALS SCORES:	175	225	275	325	375	500

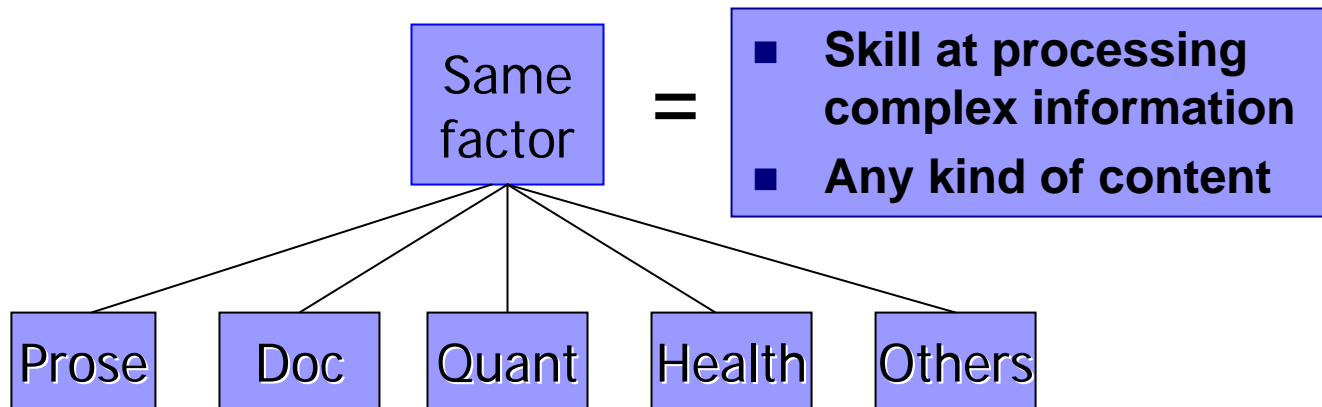
Cognitive Hurdles in Daily Self-Care: Less Obvious Examples

- Hypertension
 - No outward symptoms
 - So treatment is a nuisance without obvious benefits
- Asthma
 - Symptoms are obvious, but benefits of the superior drug are not
 - Bronchodilators give immediate but only temporary relief
 - Inhaled steroids don't give fast relief but provide better long-term control—and reduce likelihood of emergencies
- Cognitive hurdles common to both

Reasoning, not “reading”

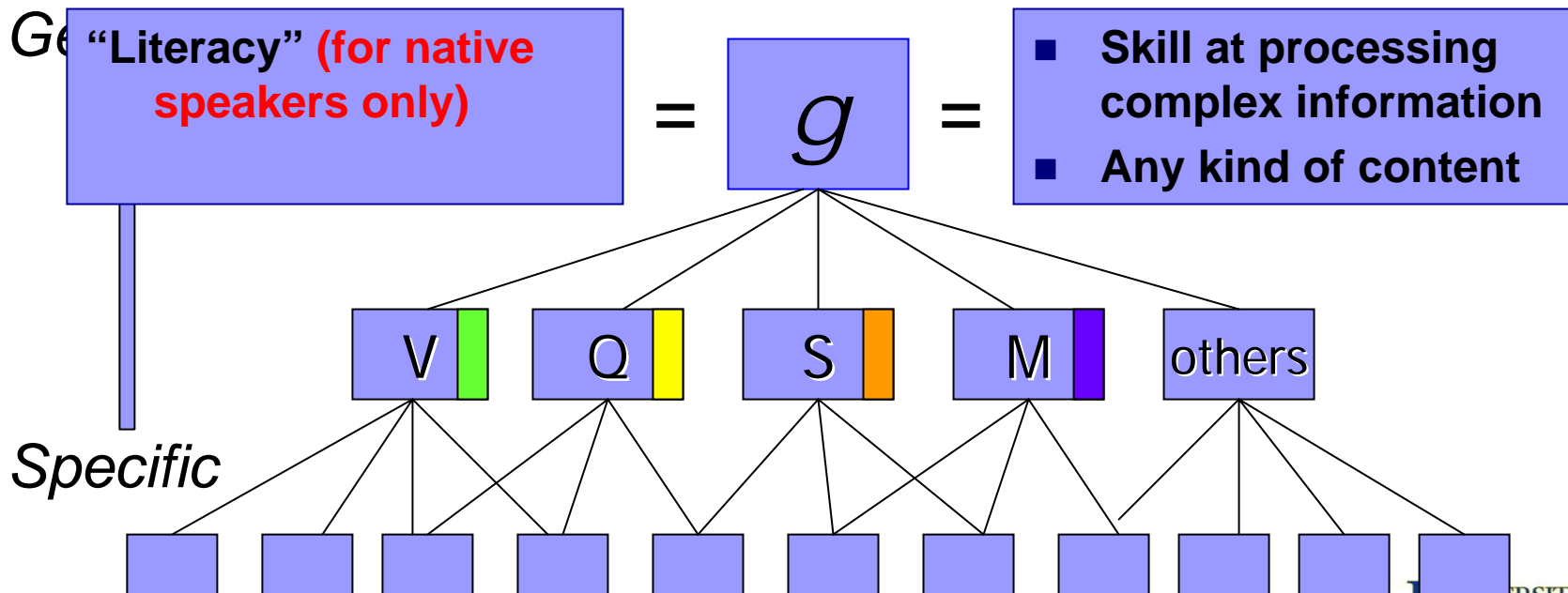
Different Literacy Scales, But Same Learning-Reasoning Ability

- All scales give nearly identical results
- All capture same ability to “comprehend & reason—to understand, analyze, interpret, & evaluate information & apply principles & concepts”
- Item difficulty depends on complexity—not content—of information to be processed



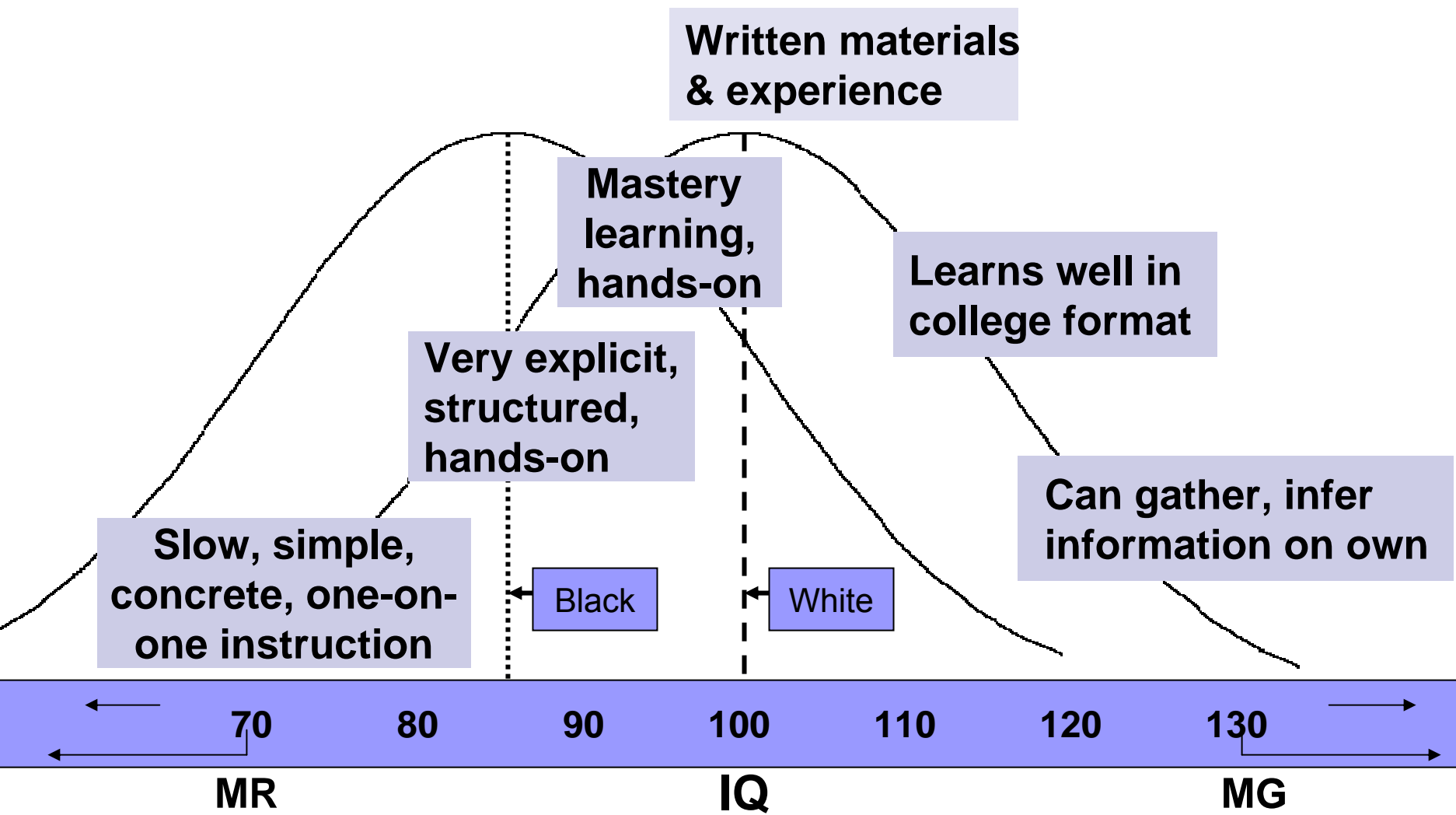
Many Abilities, But One Intelligence—The g Factor

- All abilities correlated (*not identical*)
- g is backbone of all others
- Captures “a general ability to learn, reason, think abstractly”



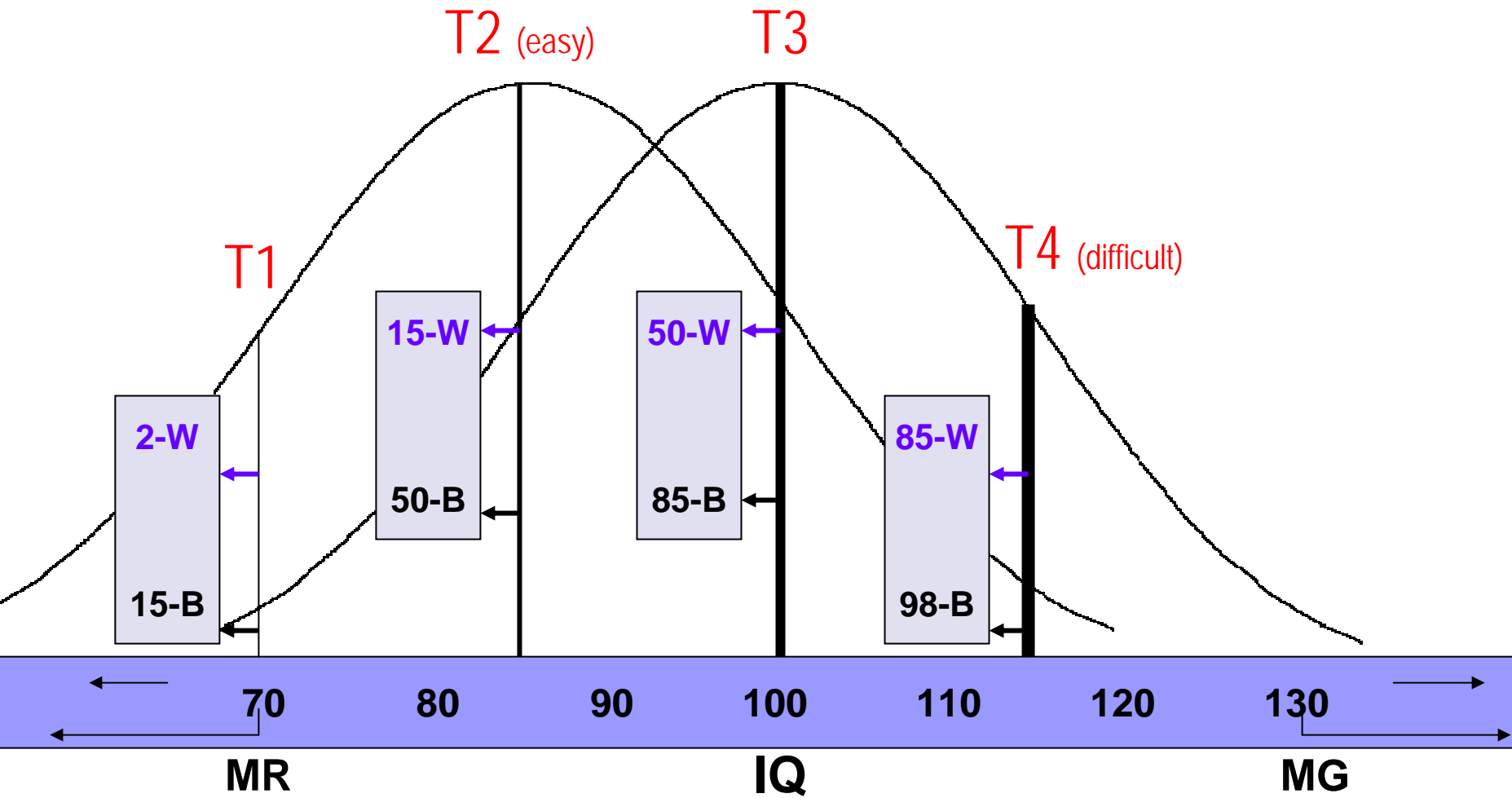
Apt Learning Requires Apt Reasoning and Understanding

Young Adults



Disparities in Risk Vary by Task Complexity Level (T)

% Whites and Blacks at high risk of non-adherence (cognitive error)

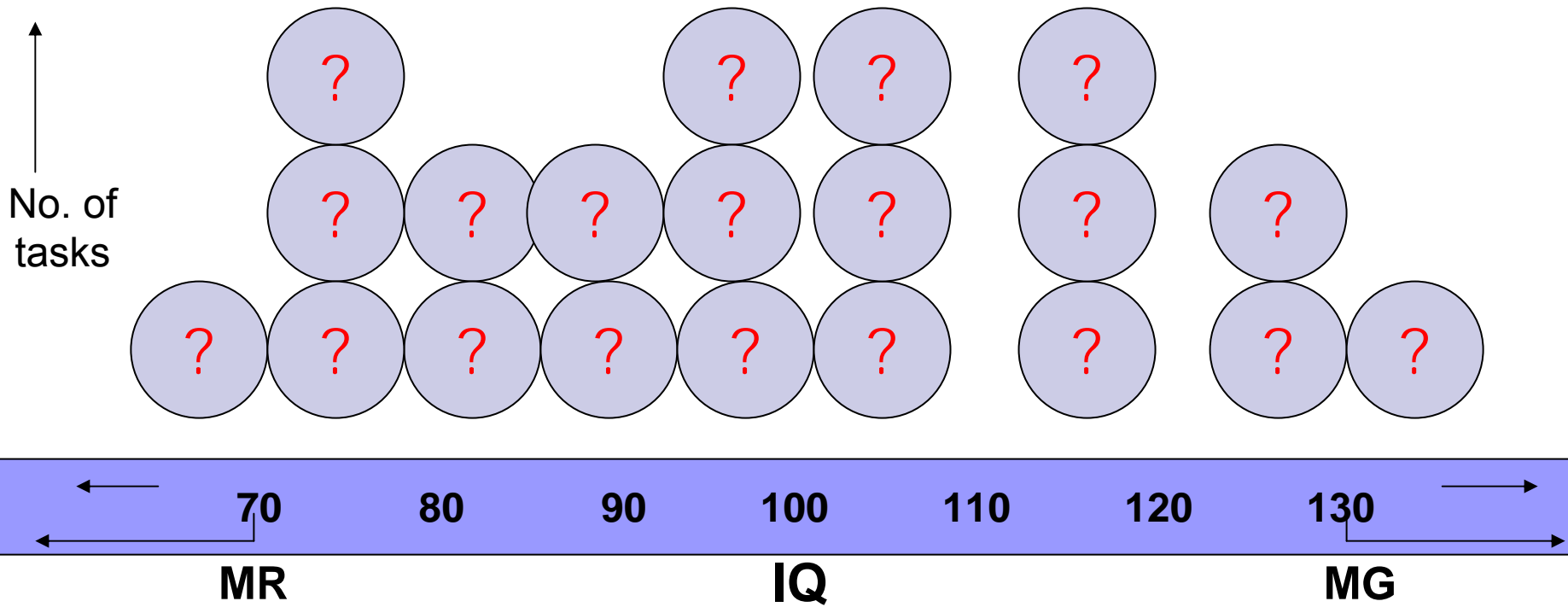


Distribution of Cognitive Hurdles?

Medical advances increase complexity

Easy is

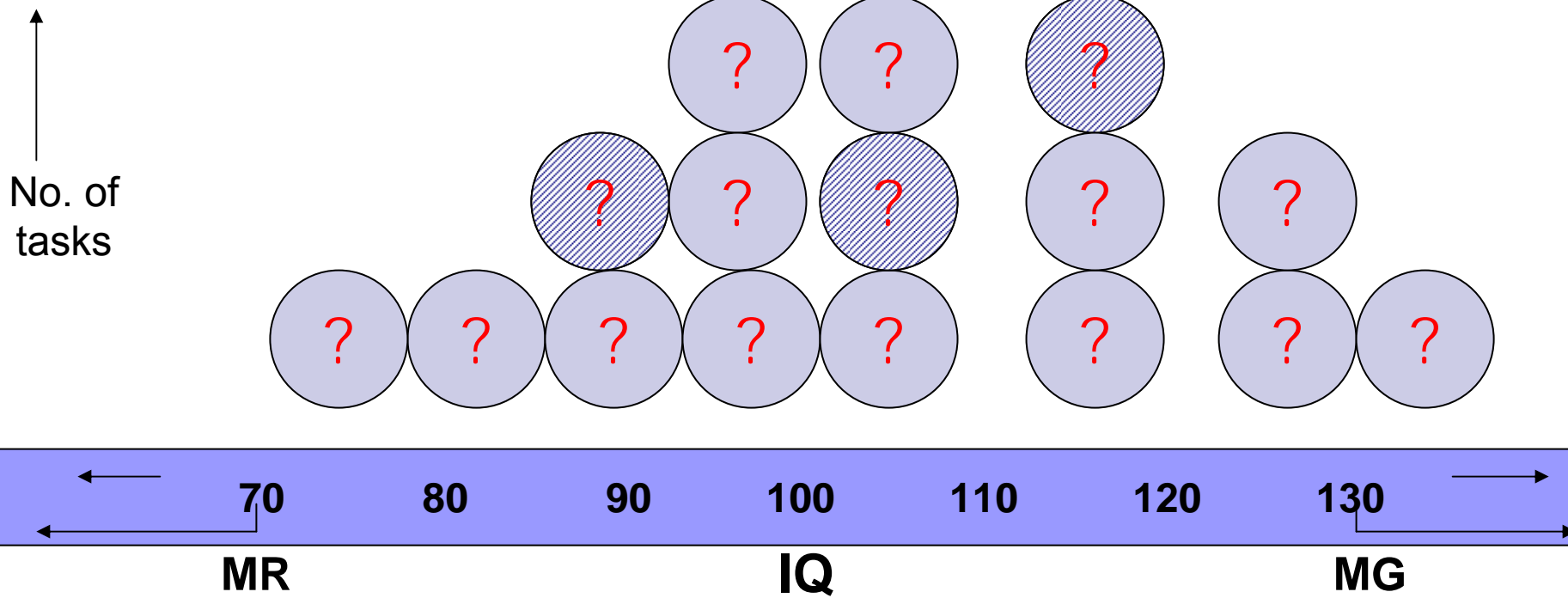
Broad range is more likely



Distribution of Cognitive Hurdles?

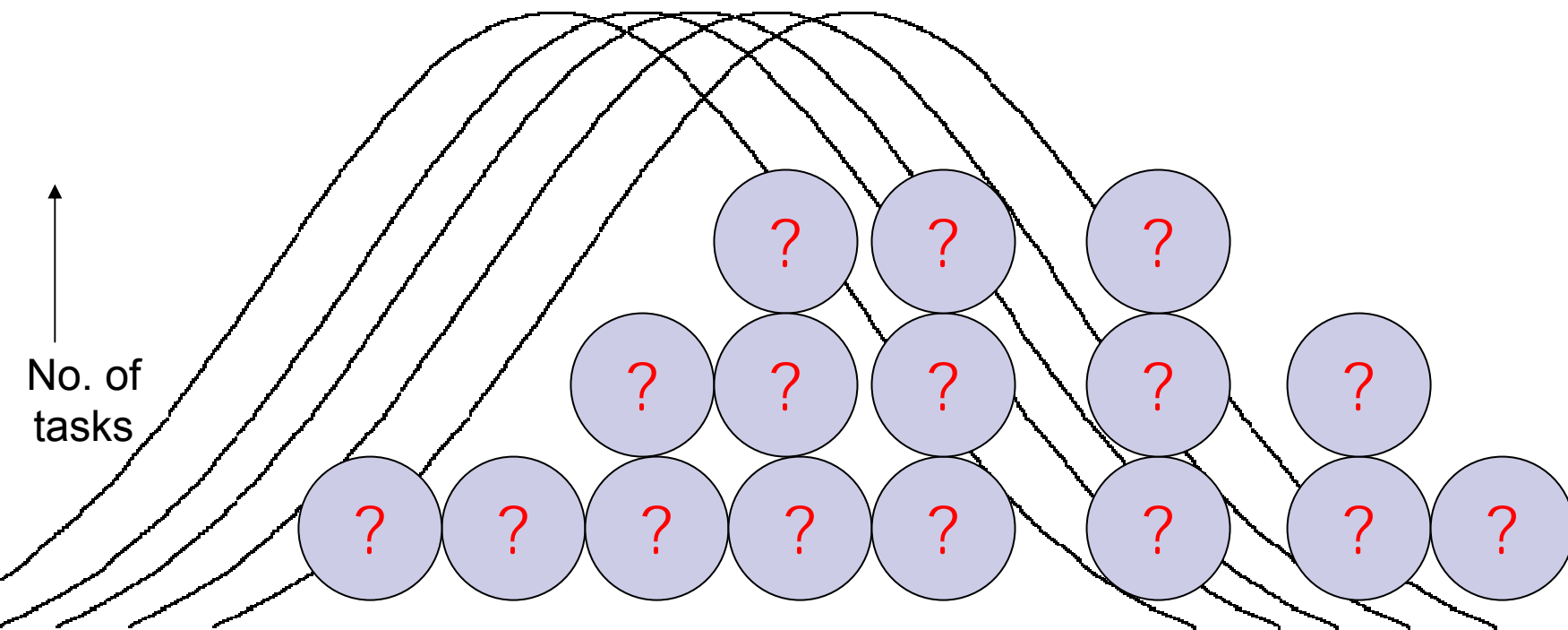
Medical advances increase complexity

Some complexity unnecessary, but much inherent



Distribution of Cognitive Hurdles?

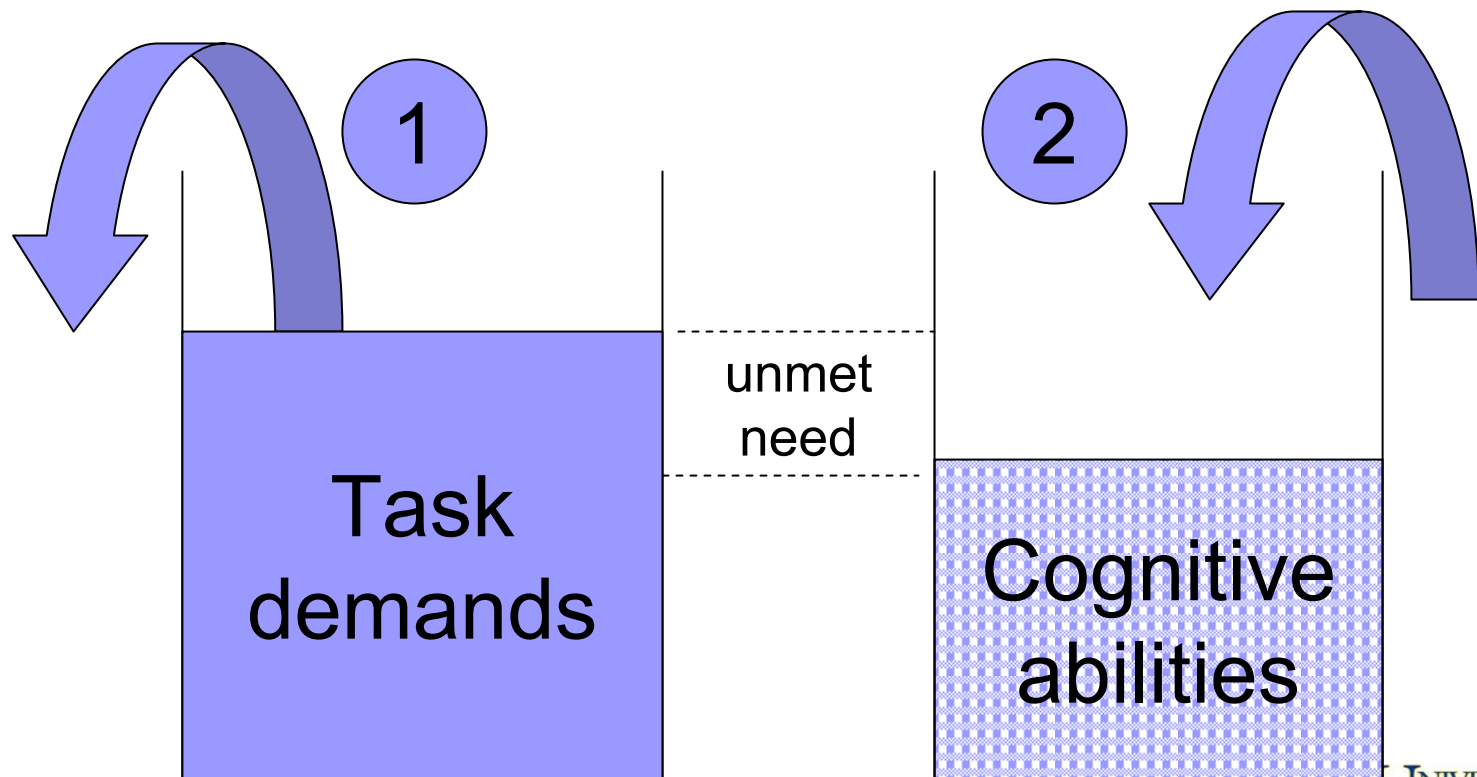
Aging lowers our ability to deal with it



Raw mental power (scores not age-normed)

Can Minimize Cognitive Hurdles

1. Reduce task complexity, where possible
2. Provide cognitive assistance



Why g ? g Theory Gives Good Guidance

Strong evidence base, clockwork patterns

- What to do
 - How to audit task complexities in self-care
 - How to audit total job complexity (e.g., diabetes self-management)
 - How to audit patient populations' cognitive needs
 - How to quickly estimate individual patient's cognitive needs and supports
 - How to fashion instruction more sensitive to patient's cognitive needs

- What to expect
 - Which self-care tasks will have highest error rates (non-adherence)
 - How changes in task complexity will change adherence rates
 - Size of age & race disparities to expect on different health tasks
 - How disparities will increase or decrease with as treatment complexity rises or falls

- New tools for providers—all providers
- More feasible than eradicating social inequality
- More humane than denying ability differences

Thank you.