

Ways to Reduce the Learning Demands that Magnify Health Disparities

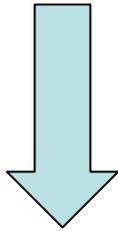
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Cleveland Roundtable Community Council
April 13, 2005

Individuals

If:

Learning problems

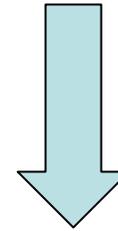


Health problems

Groups

Then:

Learning gaps



Health disparities

Influences on Person's Health

External

"Exposure"

- Resources
 - Income
 - Insurance
 - High quality care
- Risks
 - Discrimination
 - Unhealthy environs

Internal

"Susceptibility"

- Values
 - Motivation
 - Interests
 - Trust/fear
- } **"Will Do"**
- Knowledge
 - Abilities
- } **"Can Do"**

Equally good conditions?

Equally effective use?

Why Look at Abilities?

- Mostly ignored in health literature
- But an important influence on health
- So a new window of opportunity
- Especially for narrowing health disparities

And—

- The “intervention paradox” requires it

Paradoxical Effect of Equalizing Resources Across Groups

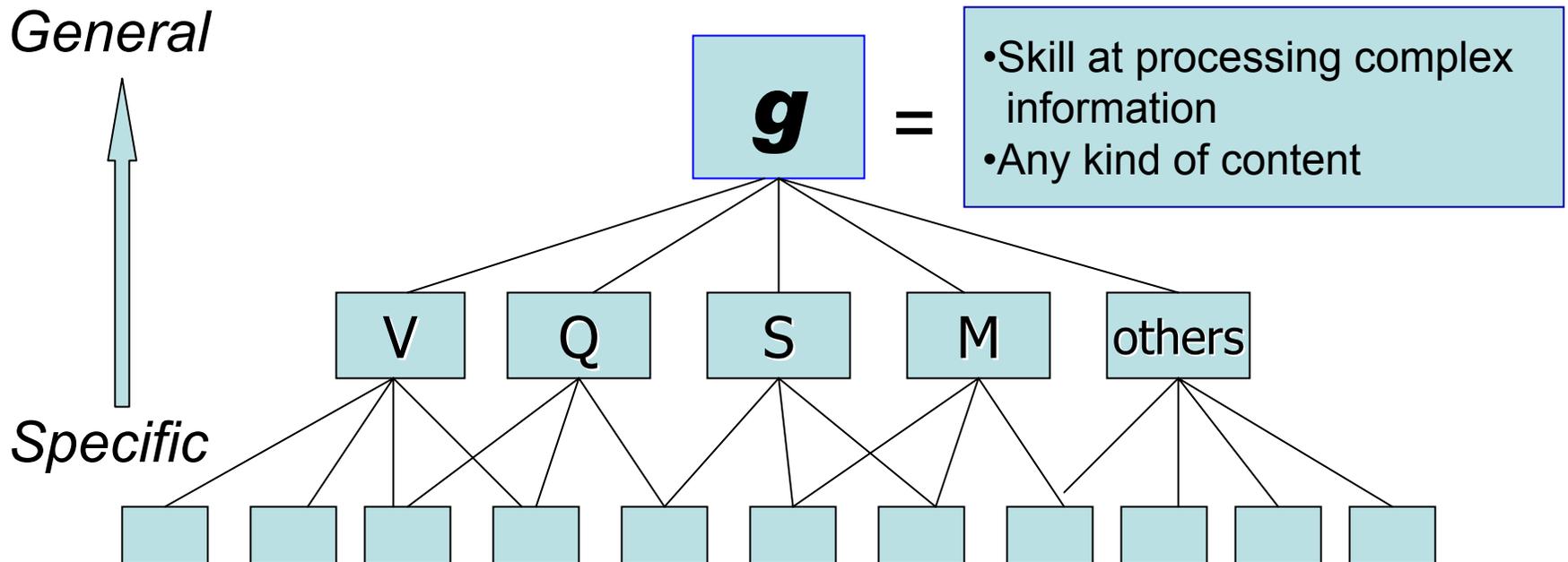
- Health disparities increase
 - When **health care** is made more widely available (Britain with national health care)
 - When **health information** is made more widely available (signs and symptoms of cancer, diabetes, etc.)

This happens with many sorts of social interventions—
Better learners are better able to exploit the same resources.

Which Abilities Matter Most?

If same pattern holds as in work and school, then:

- Mental (not physical or social)
- Most general



What Is The General Factor (g)?

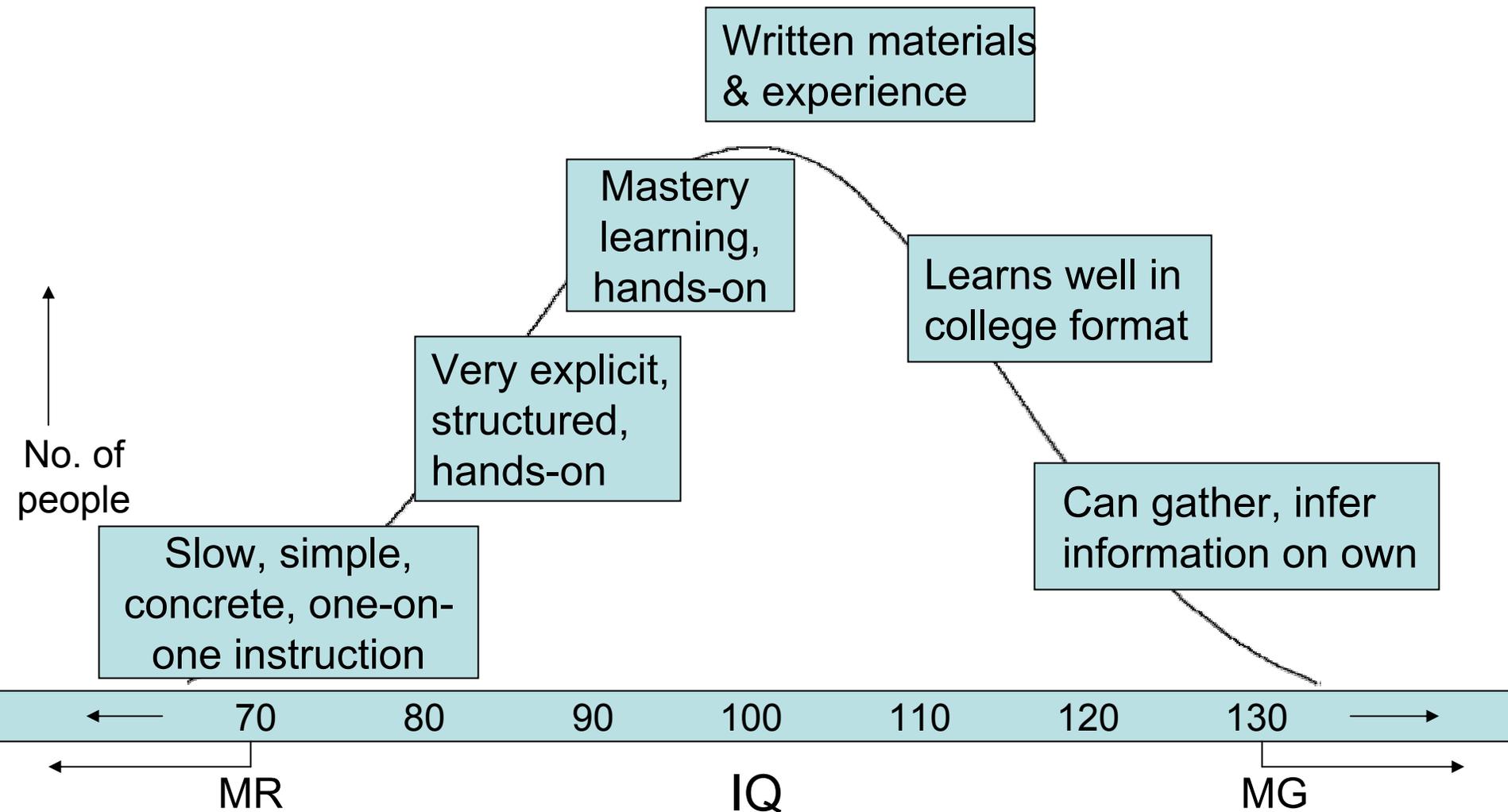
Measured well by: IQ tests

But aren't they biased? (more on that later)

Everyday meaning:

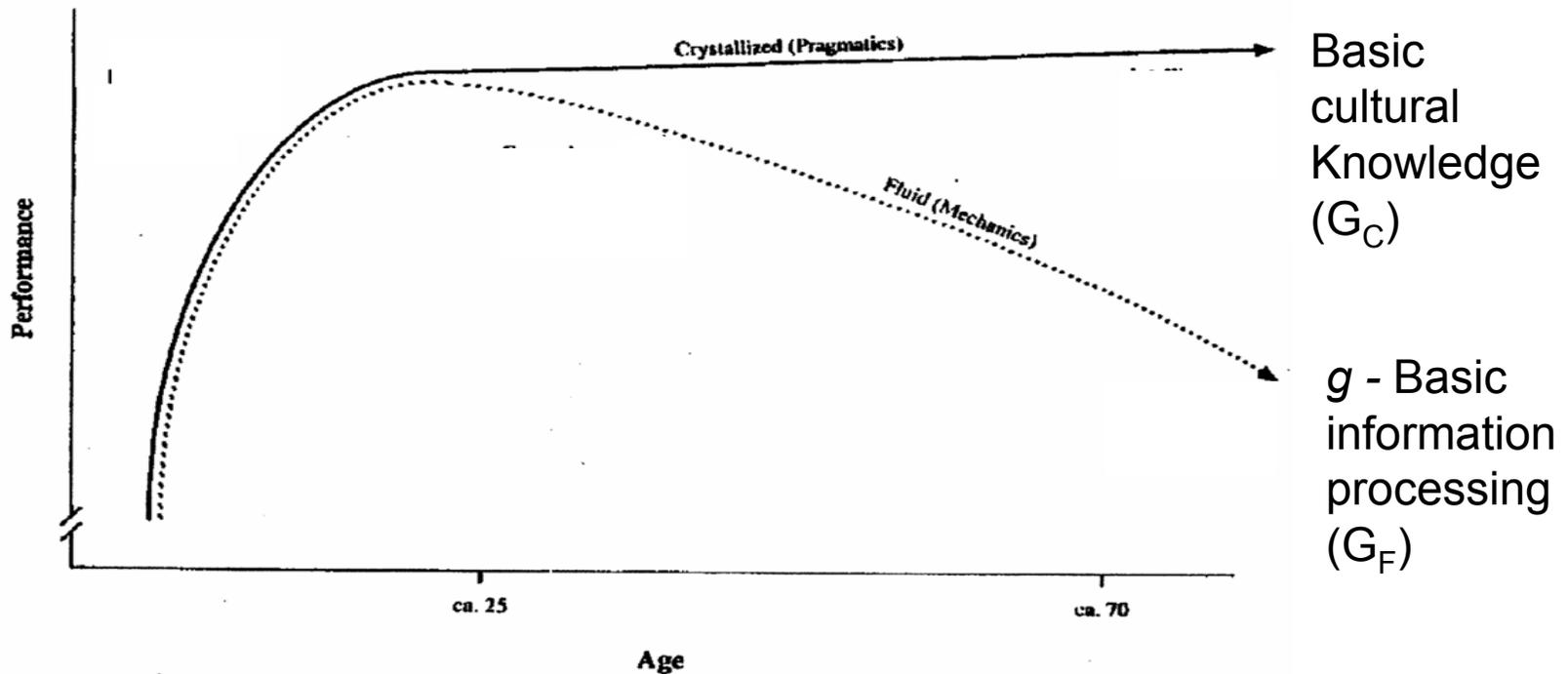
Adept learning and
reasoning

Typical Learning Needs at Different IQs



How Stable Is IQ/g?

1. Raw mental horsepower (ability to learn and reason) rises into early adulthood, then falls



How Stable Is IQ/g?

1. Raw mental horsepower (ability to learn and reason) rises into early adulthood, then falls
2. But score relative to age mates (“IQ”) is stable from adolescence on (it could not predict health otherwise)
3. There is no known way to change 1 or 2 above

Does IQ Predict Health?

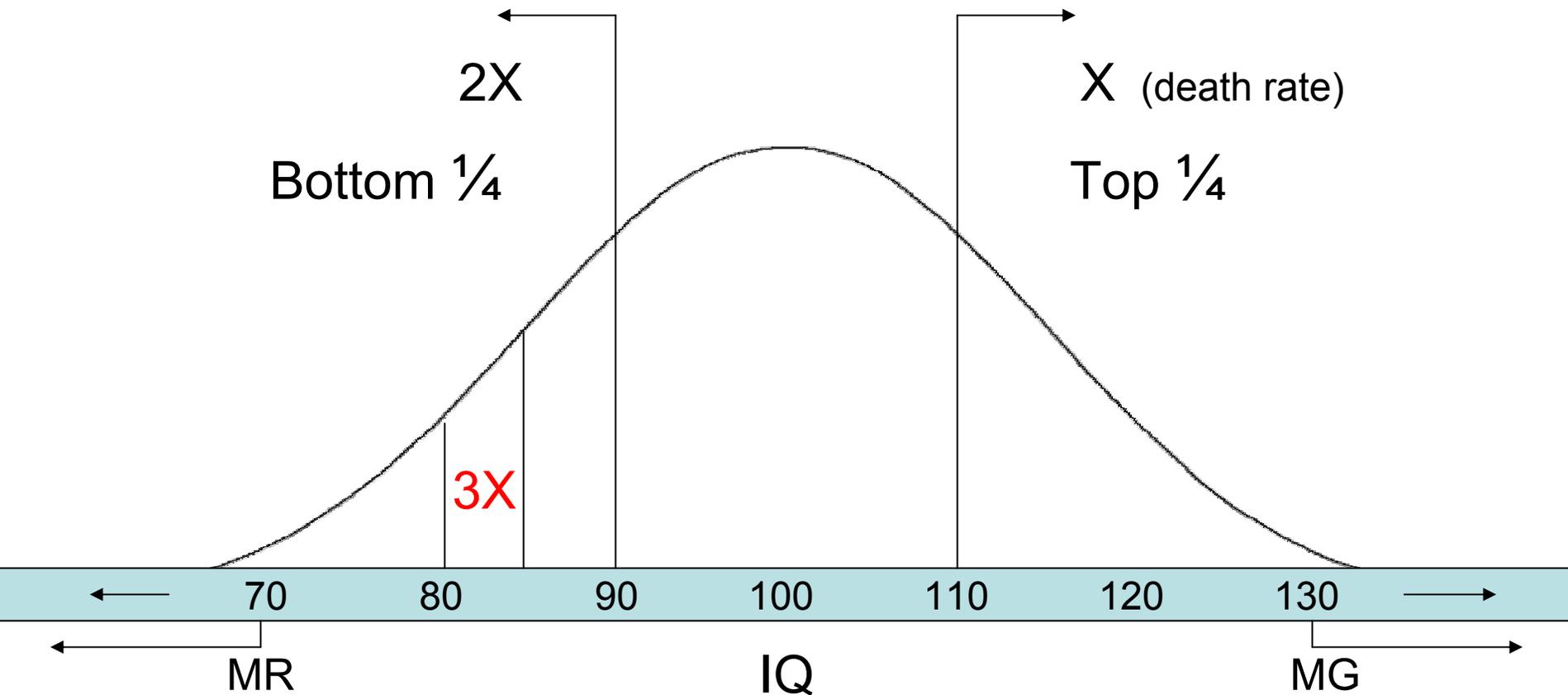
- Childhood IQ predicts adult mortality
- 8 big cohort studies

(Whites)	Birth yr	IQ age	Followed to	(N)
Australia	1947-53	18	29-35	1786
Britain	1947	8	54	2057
Denmark	1953	12	48	7319
Scotland	1946-52	11	50-56	11,859
Scotland	1936	11	65	908
Scotland	1921	11	80	922
Scotland	1921	11	76	2217
Sweden	1936	10	43	831

How Well Does IQ Predict Mortality?

8 big studies

Death rate is twice at high below IQ 90 as above IQ 110
1 more IQ point = 1% lower death rate



Example: Motor Vehicle Deaths

Australian veterans followed to age 40	Death rate per 10,000
IQ: above 115	51.3
100-115	51.5
85-100	92.2
80- 85	146.7

2x

3x

“People with lower IQ may have a poorer ability to assess risks and, consequently, may take more risks in their driving.”

Is IQ Causal?

IQ predicts better than socioeconomic status (SES)

- Australia (IQ at Army induction)

- All-cause mortality (before age 40) →
- Motor vehicle deaths
- Suicide

Below age 40,
most deaths are
from injury

- Scotland (IQ at age 11)

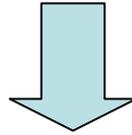
- Longevity (6 decades later) →
- Heart disease, lung cancer mortality
- Smoking cessation

Above age 40,
most deaths are
from chronic
illness

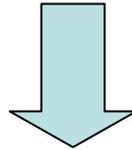
If we take SES seriously, we have to take IQ seriously.

One Causal Dynamic

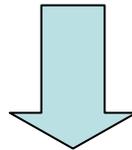
Lower IQ



Learning & reasoning problems



Health-damaging behaviors



More health problems

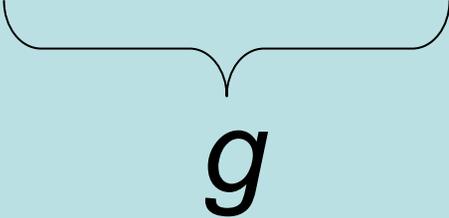
Non-IQ Evidence for Impact of Learning-Reasoning Ability

- Functional literacy
- Health literacy

Functional Literacy in Daily Life

NALS Level	% pop (white)	Reading grade level	Simulated Everyday Tasks (National Adult Literacy Survey, 1993)
1	14%	2.5	<ul style="list-style-type: none"> Total bank deposit entry Locate expiration date on driver's license
2	25%	7.2	<ul style="list-style-type: none"> Determine difference in price between 2 show tickets Locate intersection on street map
3	36%	12	<ul style="list-style-type: none"> Calculate miles per gallon from mileage record chart Write brief letter explaining error on credit card bill
4	21%	16	<ul style="list-style-type: none"> Use eligibility pamphlet to calculate SSI benefits Explain difference between 2 types of employee benefits
5	4%	16+	<ul style="list-style-type: none"> Use calculator to determine cost of carpet for a room Use table of information to compare 2 credit cards

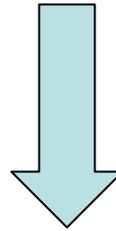
Functional Literacy in Daily Life

NALS Level	% pop (white)	Reading grade level	Just a sample of the many tasks adults expected to learn on own
1	14%	2.5	<p>NOT READING <i>PER SE</i>, BUT:</p> <ul style="list-style-type: none"> • “complex information processing skills” • “verbal comprehension & reasoning” • “ability to understand, analyze, evaluate” <p style="text-align: center;">  <i>g</i> </p>
2	25%	7.2	
3	36%	12	
4	21%	16	
5	4%	16+	
			Predicts life outcomes in same pattern as does IQ

- “Problem-solving abilities”
- “Ability to acquire new information and complete complex cognitive tasks”

g

Health literacy (TOFHLA)



- More health knowledge
- Better health
- Less hospitalization
- Lower health costs/year

Example: Non-Adherence

- Patients examine the actual vials or documents

% of urban hospital outpatients <i>not</i> knowing:	Health literacy level		
	V-low	Low	OK
<div style="border: 1px solid black; 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

Non-Adherence Is Huge Problem

Literacy researchers have concluded:

- It often results from patients failing to “learn, reason, & problem-solve”
(not willful non-compliance)
- It can be a matter of life & death
“Ability to learn and correctly follow the treatment regimen for a heart attack will determine a trajectory toward recovery or a downward path to recurrent myocardial infarction, disability, and death.”

Chronic Illnesses Require Foresight & Prevention

- Keep informed
- Live healthy lifestyle
- Get preventive checkups
- Detect signs and symptoms
- Seek timely, appropriate medical attention

All require independent learning & reasoning

Chronic Illnesses Require Self-Regulation

- Follow treatment regimen
 - Use medications as prescribed
 - Diet, exercise, no smoking, etc.
 - Including for diseases without outward signs (e.g., hypertension)
- Monitor daily signs and symptoms
- Adjust medication and behavior in response to signs
- Have regular check-ups

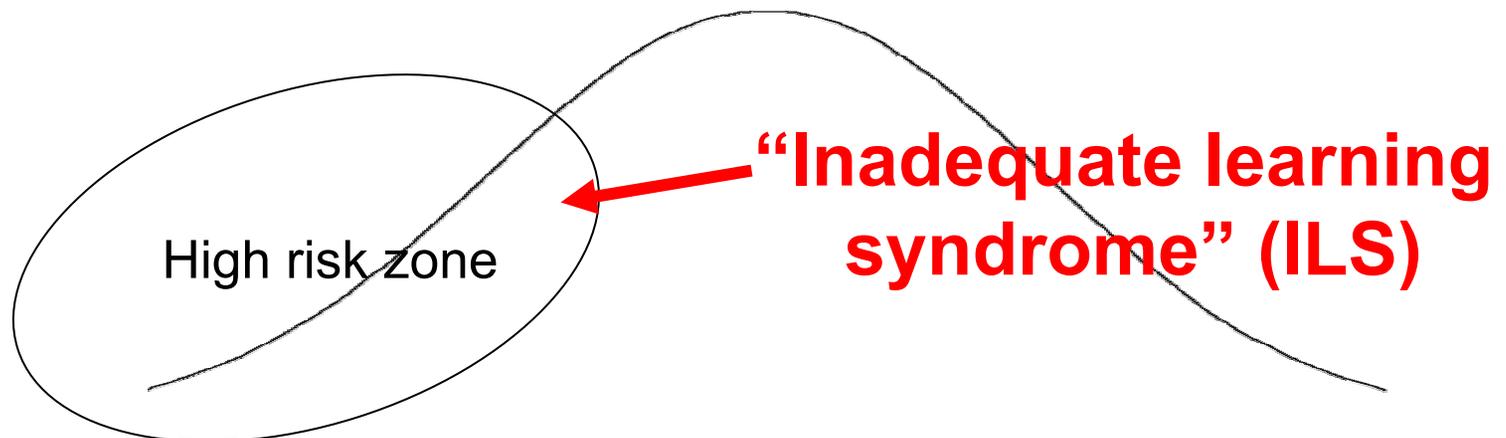
All require independent learning & reasoning

Example: Self-Regulation to Limit Damage

Urban hospital outpatients: % diabetics <u>not</u> knowing that:	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: Suddenly sweaty/shaky/hungry usually means <u>blood sugar too low</u> →	50	15	6
Action: Eat some form of sugar →	62	46	27

Recap: Individual Differences

- Individuals differ in learning ability
 - Differences span wide range
 - Resist change
 - Affect personal well-being
 - We must respect & accommodate adults as they are



Intro: Group Differences

- IQ tests not biased (predict equally well for American whites, blacks, Hispanics)—if native speaker
- Score gaps represent real gaps in ability
 - Gaps are the rule, not the exception
 - Vary in size
 - Resist change
 - Have practical consequences
 - Sources still not clear
- Implication for providers: Respect and accommodate adults as they are

Intro: Group Differences

- IQ tests not biased (predict equally well for American white speaker)

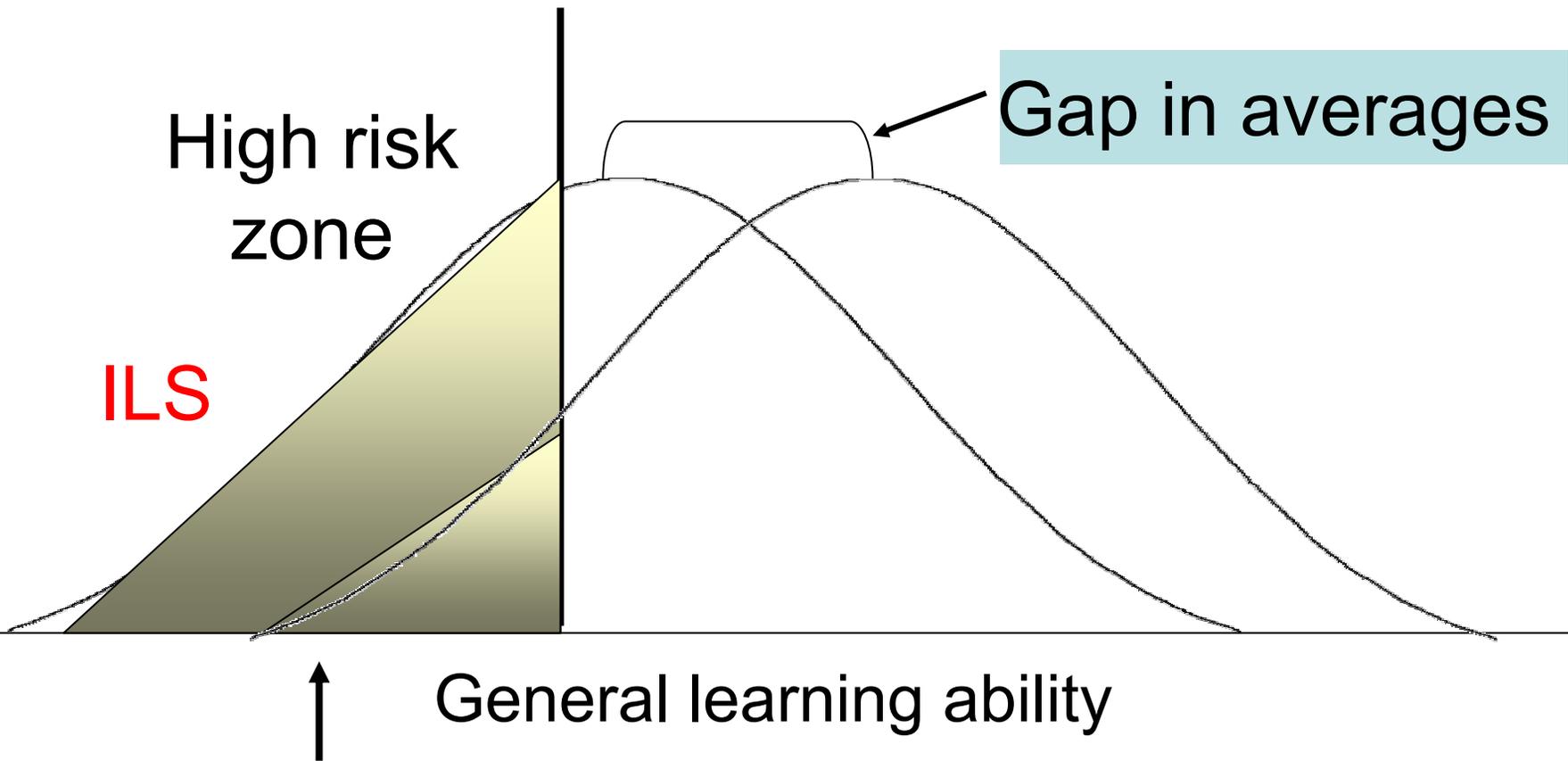
- Score gaps reported
 - Gaps are the rule
 - Vary in size
 - Resist change
 - Have practical consequences
 - Sources still not clear

These conclusions are:

- Scientifically mainstream
- Often from researchers who intended to prove the opposite
- Distorted by the media

- Implication for providers: Respect and accommodate adults as they are

Gaps in Ability to Learn: Two Aspects



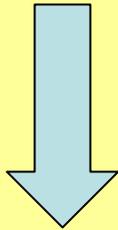
Gap in proportions at risk (“disparate impact”)

Individuals

Groups

If:

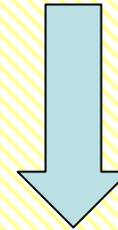
Learning problems



Health problems

Then:

Learning gaps



Health disparities

We should assume that learning gaps help create health disparities

Example 1: Gaps in Functional Literacy

NALS Level	% pop (white)	% pop (black)	Simulated Everyday Tasks Adults aged 16+
1	14%	38%	<p>At high risk (National Goals Panel)</p>
2	25%	37%	
3	36%	21%	<ul style="list-style-type: none"> Calculate miles per gallon from mileage record chart Write brief letter explaining error on credit card bill
4	21%	4%	<ul style="list-style-type: none"> Use eligibility pamphlet to calculate SSI benefits Explain difference between 2 types of employee benefits
5	4%	<1%	<ul style="list-style-type: none"> Use calculator to determine cost of carpet for a room Use table of information to compare 2 credit cards

Example 2: Gaps in Functional Literacy

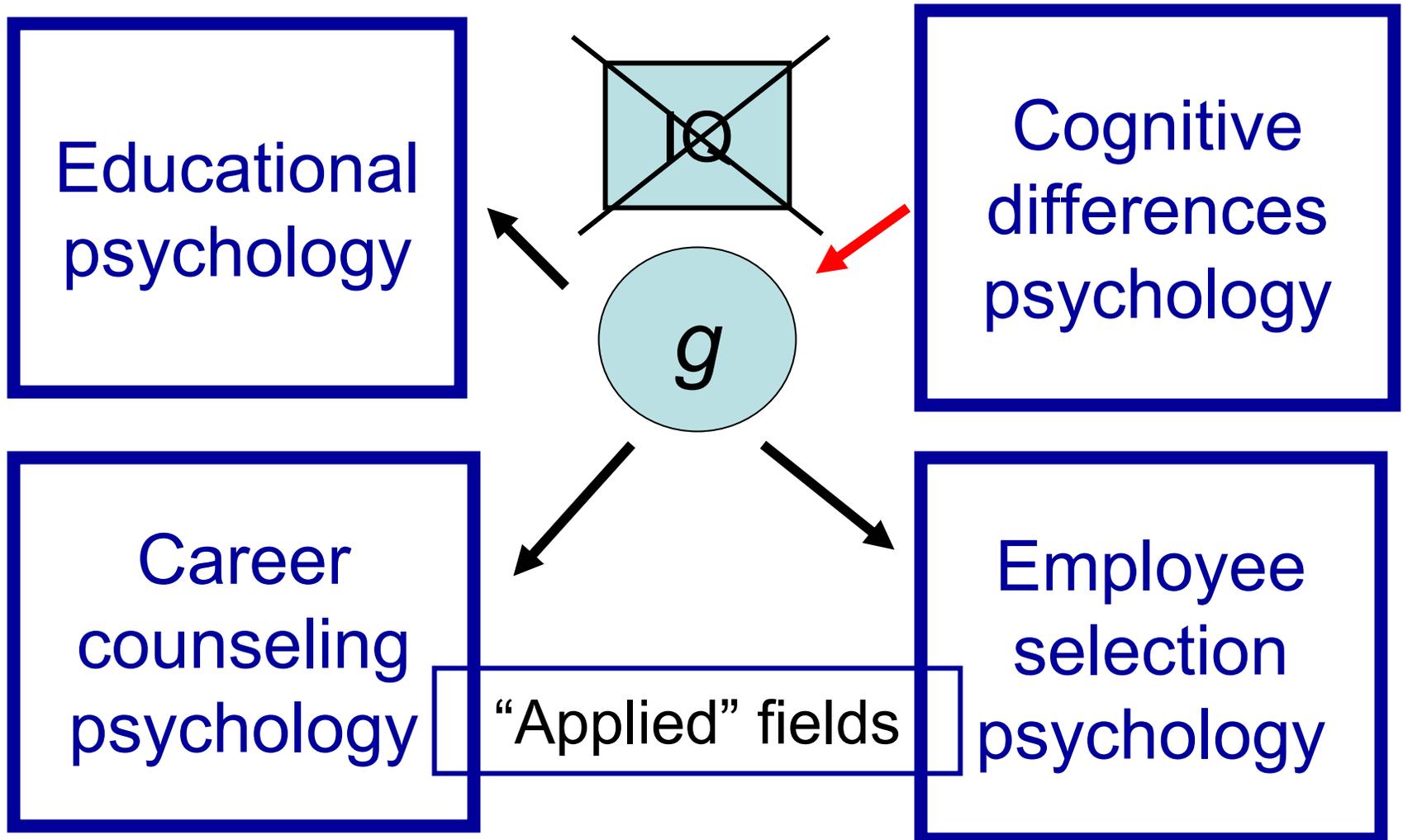
NALS Level	% pop (white)	% pop (Hisp/Mex)	Simulated Everyday Tasks Adults aged 16+
1	14%	54%	<p>At high risk (National Goals Panel)</p>
2	25%	25%	
3	36%	16%	<ul style="list-style-type: none"> ▪ Calculate mileage record chart ▪ Write for on credit card bill
4	21%	5%	<ul style="list-style-type: none"> ▪ Use calculate SSI benefits ▪ Explain difference between 2 types of employee benefits
5	4%	<1%	<ul style="list-style-type: none"> ▪ Use calculator to determine cost of carpet for a room ▪ Use table of information to compare 2 credit cards

48% foreign born

Recap: Group Disparities

- Health disparities result partly from learning gaps
- There appears to be nothing inherently racial about gaps in learning ability
 - Basic learning and reasoning processes are the same
 - All groups span the full range of ability
 - Inadequate learning creates big problems, regardless of a person's race
 - Groups differ only in their proportions of more and less effective learners

New Windows of Opportunity



Who Guards Your Health?

Consider chronic illnesses

- “Slow-acting, long-term killers that can be treated but not cured”
- Self-care is as important as medical care
 - Diet, exercise, no drug or alcohol abuse
 - Preventive checkups, adherence to treatment
 - Safety precautions (condoms)
- Require continued need “to learn,” “reason,”
and “solve problems”

Mostly you!

Health Self-Care Is Like a Job

- Set of duties
 - Duties change with time & technology
 - Effects of bad performance add up

Chronic illnesses, injuries

- Performance is affected by:
 - Access to the necessary resources
 - Abilities, motivation, knowledge
 - Keeping up-to-date
 - Access to extra help when needed

A life-long career with no vacations or retirement.

Jobs and g

- Major findings--on worker traits that best predict job performance
 - g is useful in all jobs (so is conscientiousness)
 - g 's usefulness does not fade with experience
 - g is the best single predictor of job performance (except in simple jobs)
 - g is more useful in more complex jobs

All seem true of g in health, too.

What Makes Jobs More Complex?

- Complexity of information processing required
 - Complexity rises when jobs involve more:
 - Reasoning, analysis, planning, advising
 - Self-direction, independent learning and decision making
 - Gathering information, spotting problems, setting priorities
 - Changing, ambiguous, or unpredictable situations

All are true of health self-care, too.

Complexity: The Active Ingredient in Functional Literacy Items, Too

NALS Level	% pop (white)	Reading grade level	Simulated Everyday Tasks Adults ages 16-65
1	14%	2.5	<ul style="list-style-type: none"> Total bank deposit entry Locate health ed date
2	25%	7.2	<ul style="list-style-type: none"> Describe difference in Locate intersection on s
3	36%	12	<ul style="list-style-type: none"> Calculate miles per gal
4	21%	16	<ul style="list-style-type: none"> et w
5	4%	16+	<ul style="list-style-type: none"> rr on to compare 2 credit cards

Health ed says use Grade 5

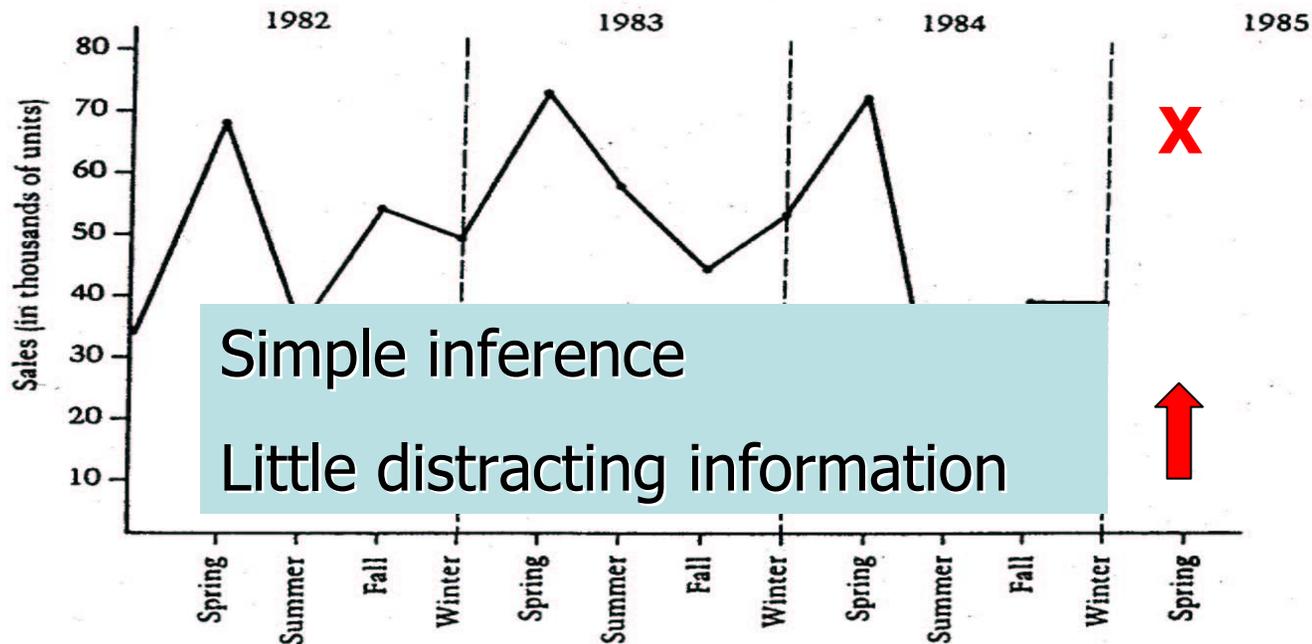
Items just a sample of the many tasks that adults expected to learn on own

Item difficulty is from “process complexity”

- Level of inference
- Abstractness of info
- Distracting info

Example: NALS Level 2

You are a marketing manager for a small manufacturing firm. This graph shows your company's sales over the last three years. Given the seasonal pattern shown on the graph, predict the sales for Spring 1985 (in thousands) by putting an "x" on the graph.



Example: NALS Level 4

On Saturday afternoon, if you miss the 2:35 bus leaving Hancock and Buena Ventura going to Flintridge and Academy, how long will you have to wait for the next bus?

ROUTE 5 VISTA GRANDE
 This bus line operates Monday through Saturday providing local service to most neighborhoods in the northeast section. Buses run thirty minutes apart during the morning and afternoon rush hours Monday through Friday. Buses run one hour apart at all other times of day and Saturday. No Sunday, holiday or night service.

OUTBOUND from Terminal						INBOUND toward Terminal						You can transfer from this bus to another headed anywhere else in the city bus system
Leave Downtown Terminal	Leave Hancock and Buena Ventura	Leave Citadel	Leave Rustic Hills	Leave North Carefree and Oro Blanco	Arrive Flintridge and Academy	Leave North Carefree and Oro Blanco	Leave Rustic Hills	Leave Citadel	Leave Hancock and Buena Ventura	Arrive Downtown Terminal		
	6:20	6:35	6:45	6:50	7:03	6:15	6:27	6:42	6:47	6:57	7:15	
	6:50	7:05	7:15	7:20	7:33	6:45	6:57	7:12	7:17	7:27	7:45 Monday through Friday only	
	7:20	7:35	7:45	7:50	8:03	7:15	7:27	7:42	7:47	7:57	8:15	
AM	7:50	8:05	8:15	8:20	8:33	7:45	7:57	8:12	8:17	8:27	8:45 Monday through Friday only	
	8:20	8:35	8:45	8:50	9:03	8:15	8:27	8:42	8:47	8:57	9:15	
	8:50	9:05	9:15	9:20	9:33						9:45 Monday through Friday only	
	9:20	9:35	9:45	9:50	10:03						10:15	
	10:20	10:35	10:45	10:50	11:03						10:45 Monday through Friday only	
	11:20	11:35	11:45	11:50	12:03						11:15	
											12:15	
											1:15 p.m.	
	12:20	12:35	12:45	12:50	1:03						2:15	
	1:20	1:35	1:45	1:50	2:03						3:15	
	2:20	2:35	2:45	2:50	3:03						4:15	
	2:50	3:05	3:15	3:20	3:33						4:45 Monday through Friday only	
PM	3:20	3:35	3:45	3:50	4:03						5:15	
	3:50	4:05	4:15	4:20	4:33						5:45 Monday through Friday only	
	4:20	4:35	4:45	4:50	5:03						6:15	
	4:50	5:05	5:15	5:20	5:33						6:45 Monday through Friday only	
	5:20	5:35	5:45	5:50	6:03						Monday through Friday only	
	5:50	6:05	6:15	6:20	6:33	6:45						
	6:20	6:35	6:45	6:50	7:03	7:15						

More elements to match
 More inferences
 More distracting information

To be sure of a smooth transfer, ask the driver at this bus the name of the second bus you need.

Ability Demands of Complex Work

Complex jobs require you to:

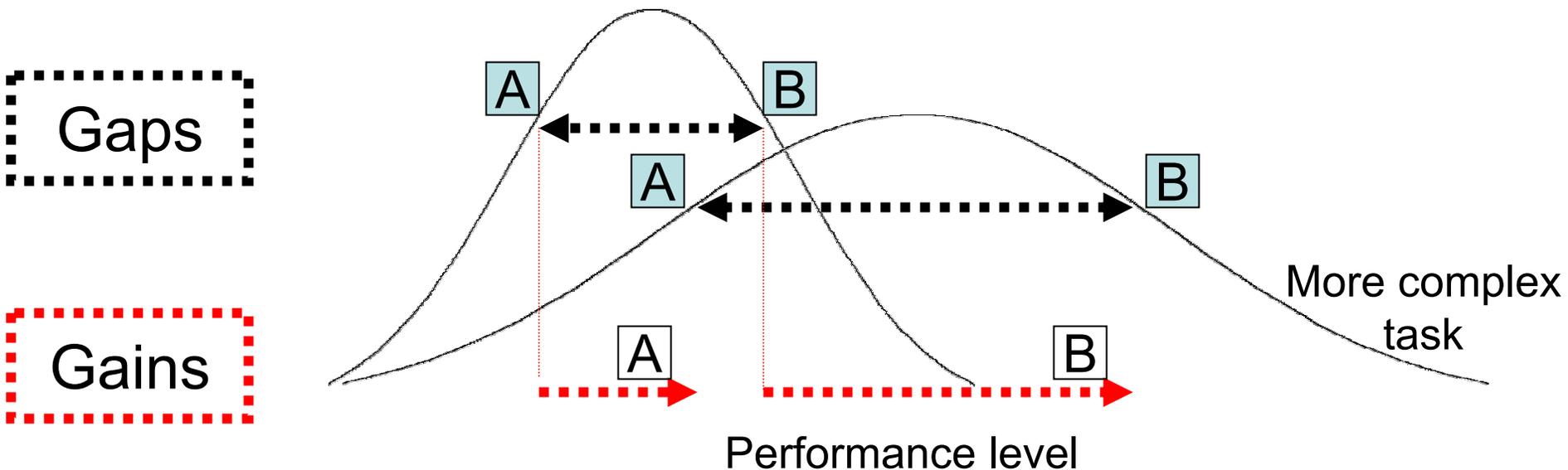
(Applied to health)

correlation with
overall job
complexity

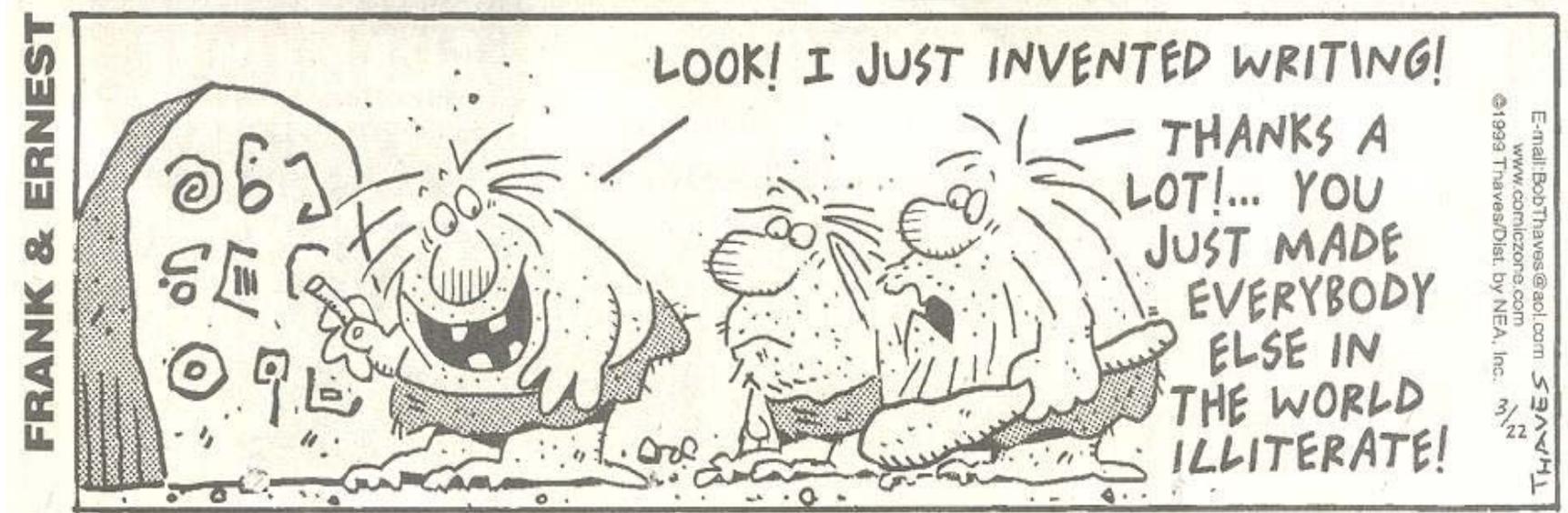
- | | |
|--|------------|
| ▪ Learn and recall relevant information (symptoms) | .75 |
| ▪ Reason and make judgments (timely preventive care) | .71 |
| ▪ Deal with unexpected situations | .69 |
| ▪ Identify problem situations quickly (hazards) | .69 |
| ▪ React swiftly when unexpected problems occur (injuries, asthma attack) | .67 |
| ▪ Apply common sense to solve problems | .66 |
| ▪ Learn new procedures quickly (treatment regimens) | .66 |
| ▪ Be alert & quick to understand things (feverish child) | .55 |

The Complexity Dynamic

- Tasks that are more complex
 - put a bigger premium on learning-reasoning ability
 - lead to bigger differences in task performance

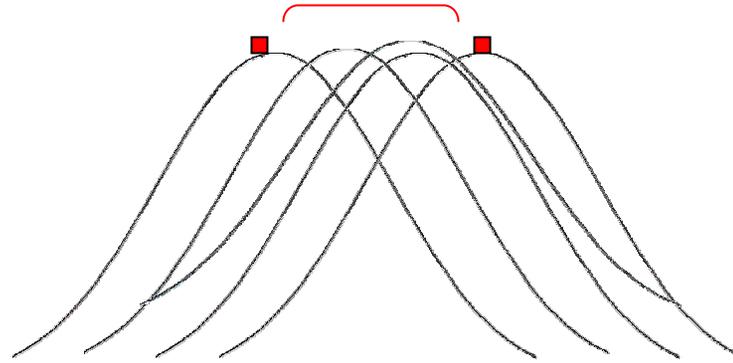


Complexity Dynamic: Example

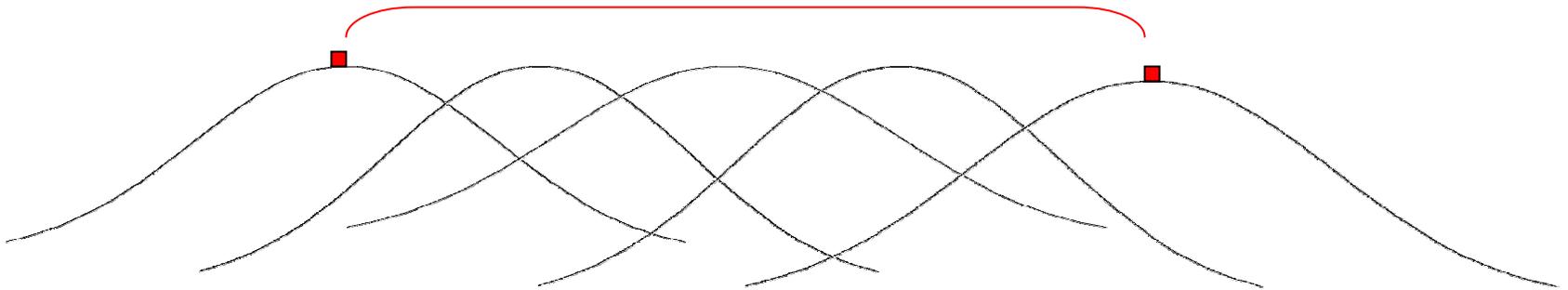


Creates Accordion Effect

- Gaps small when learning demands are light



- Gaps large when learning demands are heavy



Common in schools and jobs

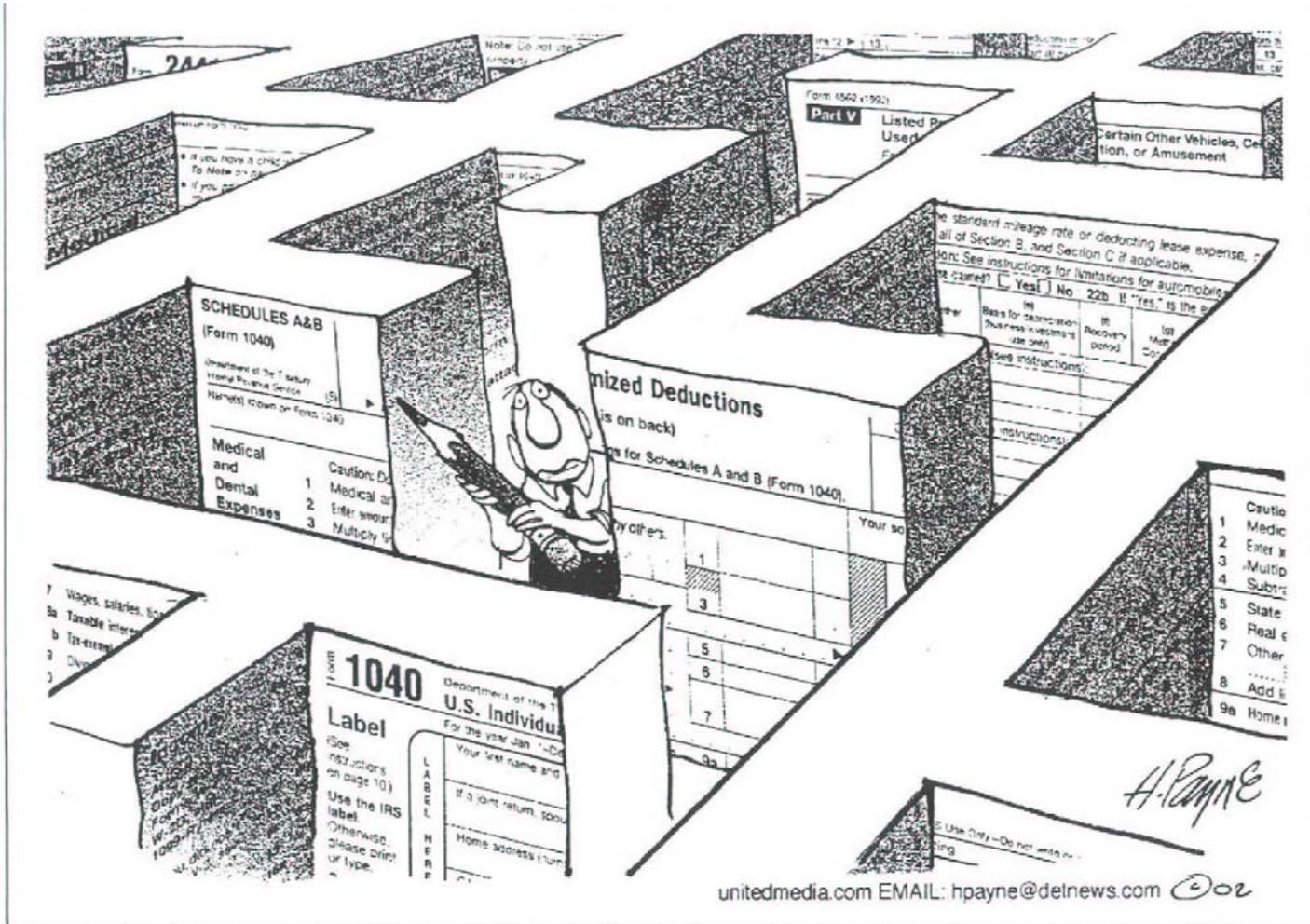
Rising Complexity: An Engine for Bigger Disparities

Treatment regimens becoming more complex

- Heart attacks
 - 1960's—just “good luck”
 - Now often includes:
 - regimen of aspirin, β -blocker, angiotensin-converting enzyme inhibitor
 - low-salt and low-cholesterol diet
 - Medicine to control hypertension, diabetes, & hypercholesterolemia

Same learning gaps will pose a growing challenge

But Much Complexity is Unnecessary



Unnecessary Complexity!

Level 3

Back of a box of cold medicine

INDICATIONS: These Maximum Strength Tablets contain four effective ingredients for the temporary relief of these major cold and flu symptoms: A Nasal Decongestant – to relieve stuffy nose and sinus congestion. An Antihistamine – to dry up runny nose and relieve sneezing. A Cough Suppressant – to quiet cough. A Non-aspirin Analgesic – to relieve headache, fever, minor sore throat pain and body aches and pain.

DIRECTIONS: Adults: 2 tablets every 6 hours while symptoms persist, not to exceed 8 tablets in 24 hours, or as directed by a doctor. Children under 12: Consult a doctor.

WARNINGS: KEEP THIS AND ALL OTHER MEDICATIONS OUT OF THE REACH OF CHILDREN. IN CASE OF ACCIDENTAL OVERDOSE, SEEK PROFESSIONAL ASSISTANCE OR CONTACT A POISON CONTROL CENTER IMMEDIATELY. PROMPT MEDICAL ATTENTION IS CRITICAL FOR ADULTS AS WELL AS FOR CHILDREN. Do not take this product if you are pregnant or nursing a baby. Consult your health professional before using this product. Do not give this product to children under 12 years of age. If symptoms do not improve after for more than 3 days, if new symptoms occur, or if redness or swelling of the throat is present, consult a doctor. Do not exceed recommended dosage. If nervousness, dizziness, or sleeplessness occur, discontinue use. A persistent cough may persist for more than 7 days, or if accompanied by rash, persistent headache, fever that lasts for more than 3 days, or if new symptoms occur, consult a doctor. Do not take this product for smoking cessation. If you are taking sedatives or tranquilizers without first consulting your doctor. Use caution when driving a motor vehicle or operating machinery. May cause excitability, especially in children.

Cluttered

Poor chunking

Hard words

Key points buried

emphysema or chronic bronchitis, or if you have heart disease, high blood pressure, thyroid disease, diabetes, glaucoma or difficulty in urination due to prostate enlargement. May cause marked drowsiness. Do not take with alcohol or other sedatives. May increase drowsiness if you are taking sedatives or tranquilizers without first consulting your doctor. Use caution when driving a motor vehicle or operating machinery. May cause excitability, especially in children.

Only 61% of adults

ALCOHOL WARNING: If you generally consume 3 or more alcohol-containing drinks per day, you should consult your physician for advice on when and how you should take this product and other pain relievers.

DRUG INTERACTION PRECAUTION: Do not use this product if you are now taking a prescription monoamine oxidase inhibitor (MAOI) (certain drugs for depression, psychiatric or emotional conditions, or Parkinson's disease), or for two weeks after stopping the MAOI drug. If you are uncertain whether your prescription drug contains an MAOI, consult a health professional before taking this product.

ACTIVE INGREDIENTS (PER TABLET): Acetaminophen 500mg; Dextromethorphan HBr 15mg; Chlorpheniramine Maleate 2mg; Pseudoephedrine HCl 30mg.

OTHER INGREDIENTS: Carnauba Wax, Croscarmellose Sodium, D&C Yellow No. 10 Aluminum Lake, FD&C Red No. 40 Aluminum Lake, Hydroxypropyl Methylcellulose, Magnesium Stearate, Microcrystalline Cellulose, Polydextrose, Polyethylene Glycol, Povidone, Sodium Starch Glycolate, Starch, Stearic Acid, Titanium Dioxide, Triacetin.

STORE AT ROOM TEMPERATURE.

*This product is not manufactured or distributed by Bristol-Myers Products, distributor of Comtrex®.

DISTRIBUTED BY
AMERICAN PROCUREMENT AND LOGISTICS COMPANY
P.O. BOX 27447, SALT LAKE CITY, UT 84127-0447 • 800-405-7787

New Labeling Regulations

Lever 3

Drug Facts

Active ingredients (in each softgel) Purpose

Guaifenesin, USP 200 mg.....Expectorant
Pseudoephedrine HCl, USP 30 mg.....Nasal decongestant

Uses

- temporarily relieves nasal congestion associated with
 - the common cold
 - hay fever
 - upper respiratory allergies
 - sinusitis
- helps loosen phlegm (mucus) and thin bronchial secretions to make coughs more productive

Warnings

Do not use if you are now taking a prescription monoamine oxidase inhibitor (MAOI) (certain drugs for depression, psychiatric, or emotional conditions, or Parkinson's disease), or for 2 weeks after stopping the MAOI drug. If you do not know if your prescription drug contains an MAOI, ask a doctor or pharmacist before taking this product.

Ask a doctor before use if you have

- heart disease
- high blood pressure
- thyroid disease
- diabetes
- trouble urinating due to an enlarged prostate gland
- cough that occurs with too much phlegm (mucus)
- cough that lasts or is chronic such as occurs with smoking, asthma, chronic bronchitis, or emphysema

When using this product do not use more than directed

Drug Facts (continued)

Stop use and ask a doctor if

- you get nervous, dizzy, or sleepless
- symptoms do not get better within 7 days or are accompanied by fever
- cough lasts more than 7 days, comes back, or is accompanied by fever, rash, or persistent headache. These could be signs of a serious condition.

If pregnant or breast-feeding, ask a health professional before use.

Keep out of reach of children. In case of overdose, get medical help or contact a Poison Control Center right away.

Directions

- do not use more than 4 doses in any 24-hour period

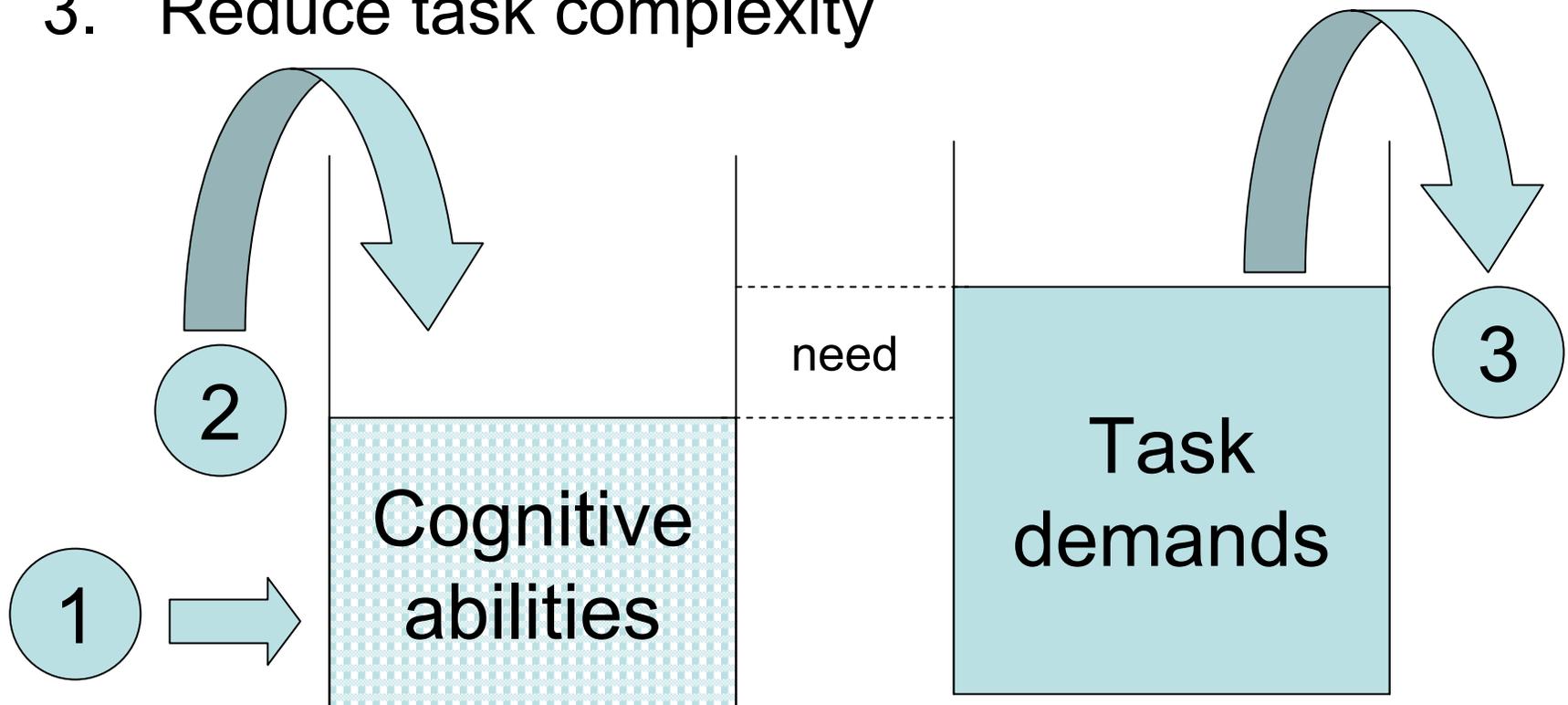
Age	Dose
adults and children 12 years and over	2 softgels every 4 hours
children 6 to under 12 years	1 softgel every 4 hours
children under 6 years	ask a doctor

Other information ■ store at 20-25°C (68-77°F)

Inactive ingredients FD&C green no. 3, gelatin, glycerin, mannitol, pharmaceutical glaze, polyethylene glycol, povidone, propylene glycol, sorbitan, sorbitol, titanium dioxide, water

3 Points of Leverage

1. Mobilize person's abilities
2. Provide cognitive assistance
3. Reduce task complexity



Cognitive Support

Level 2

- Excellent material available
 - Multicultural school psychology (new handbook out soon)
 - Health education
 - Best practices that adapt good instructional strategies to health
 - Guides for creating more readable materials
- Audit available cognitive resources
 - Need level: Profile of patient population
 - External supports & information diffusers: Staff (times, locales, cost), media, community leaders

Pick one thing to audit

Mobilize Potential

Lever 1

- Helpful discipline—career counseling
- Goals
 - Concept of life career
 - Serve individuals, not groups
 - Finding beneficial person-environment “fit”
 - Mobilize potential to develop skills
- Means
 - Assess personal strengths, weaknesses, values, constraints
 - Identify & reduce barriers
 - Promote habit of self-agency in matters they *can* control
- Common ethical concern
 - How to accommodate ability differences without labeling or restricting opportunity

• Counseling’s experience can help clarify goals

• Find short learning-reasoning test

Learning-Reasoning Test

Level 1

- Helpful discipline—Ability testing
- What content?
 - Any kind of cognitively demanding material will work, if carefully chosen
 - **Caution:** May understate client learning & reasoning ability if speaks different language or recent immigrant
 - Better to have “face validity” (not look like IQ test)
 - “Literacy,” “background knowledge,” “skills,” “information needs”
 - Seem (and be) a tool for better knowing, serving, & showing interest in clients as individuals
 - Not something where they fear “looking stupid.”

• Best practices in ability testing

Learning-Reasoning Test

Level 1

- How long a test?

- Good tests to work from

- Only broad distinctions required: 3-5 levels

- TOFHLA has 3 (very-low, low, adequate)
- REALM has 4 reading levels (Grade 3 or lower, 4-6, 7-8, 9-12)

- Short is best (10 minutes or less)

- TOFHLA, short version takes 10
- REALM takes 2-3
- Many IQ tests have short versions (use for special purposes only)

TOFHLA = Test of Functional Health Literacy of Adults
REALM = Rapid Estimate of Adult Literacy in Medicine

New

Complexity Audit

Lever 3

- Helpful disciplines—job analysis, accident analysis
 - Priorities for audit
 - Outline of the “forest:” health self-care as life career
 - One or two “trees:” diabetes, hypertension?
- Best practices in job analysis
 - Best practices in human error probability analysis
- Develop a complexity rating procedure
 - Complexity of individual tasks
 - Complexity of task configuration & sequencing
 - Identify points of vulnerability/overload
 - Identify complexity that is inherent vs. unnecessary

Building Blocks of Complexity: Examples

Lever 3

- Individual tasks

- Abstract, unstructured
- Degree of difficulty
- Ambiguous
- Distracting

Diabetes

- Multiple & interacting factors to control (food, exercise)
- No recipe to follow—circumstances vary & bodies differ
- Must monitor self constantly to avoid problems
- High sugar has no obvious bad effects when it occurs, so must conceptualize internal compounding damage
- Helps to understand abstract category of “carbohydrate” (not just refined sugar)

- Task constraints

- Multi-tasking
- Sequencing
- Unpredictable, changing conditions
- Changing mix of tasks
- Degree of supervision, need for independent judgment

- All these are cognitive hurdles for patients

More Examples of Cognitive Hurdles

Lever 3

- Hypertension
 - No outward symptoms
 - Requires change in life style
 - So nuisance is obvious but benefit is not
- Asthma
 - Symptoms are obvious, but benefits of the superior drug are not
 - Brochodilators give immediate but temporary relief
 - Inhaled steroids don't give fast relief but provide better long-term control
 - Some providers in low-education neighborhoods less often prescribe the more effective medication, perhaps because many patients don't adhere to treatments with no obvious benefits

Bottom Line

- Material barriers are important, but so too are mental ones
- We can
 - **Know** patients' mental resources
 - **Assist** by providing cognitive support
 - **Reduce** cognitive barriers where possible 
 - **Expect** to make a difference
- Impact
 - Help those who need it most
 - Narrow disparities

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