

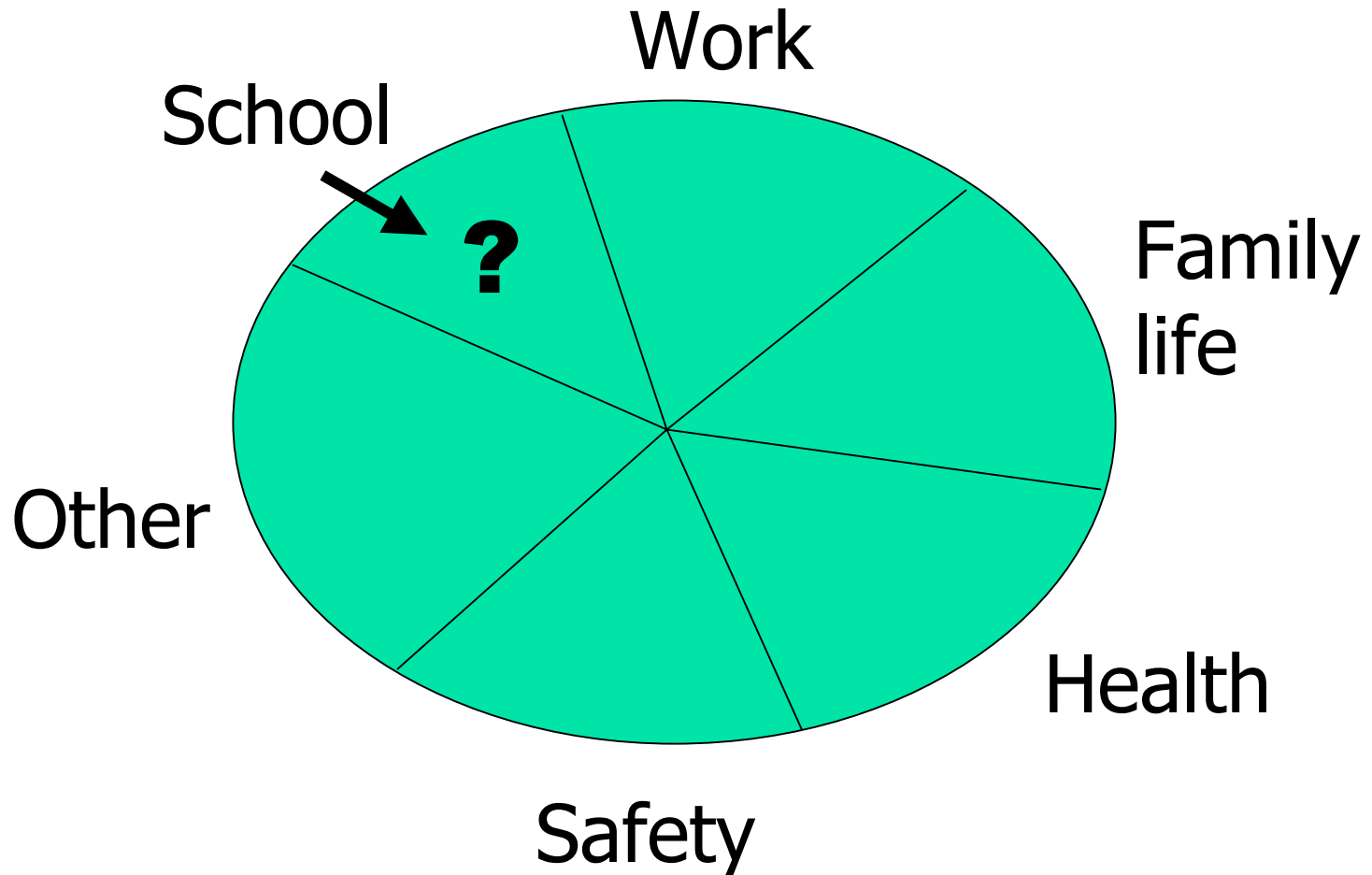


Life, Death, and Intelligence

Linda S. Gottfredson
University of Delaware
December 4, 2002

"Futures of Intellectual Assessment and Psychometrics"
Vanderbilt University

Is IQ Just an “Academic Ability”?





No

- IQ represents the single most useful tool in the toolkit of human mental abilities.



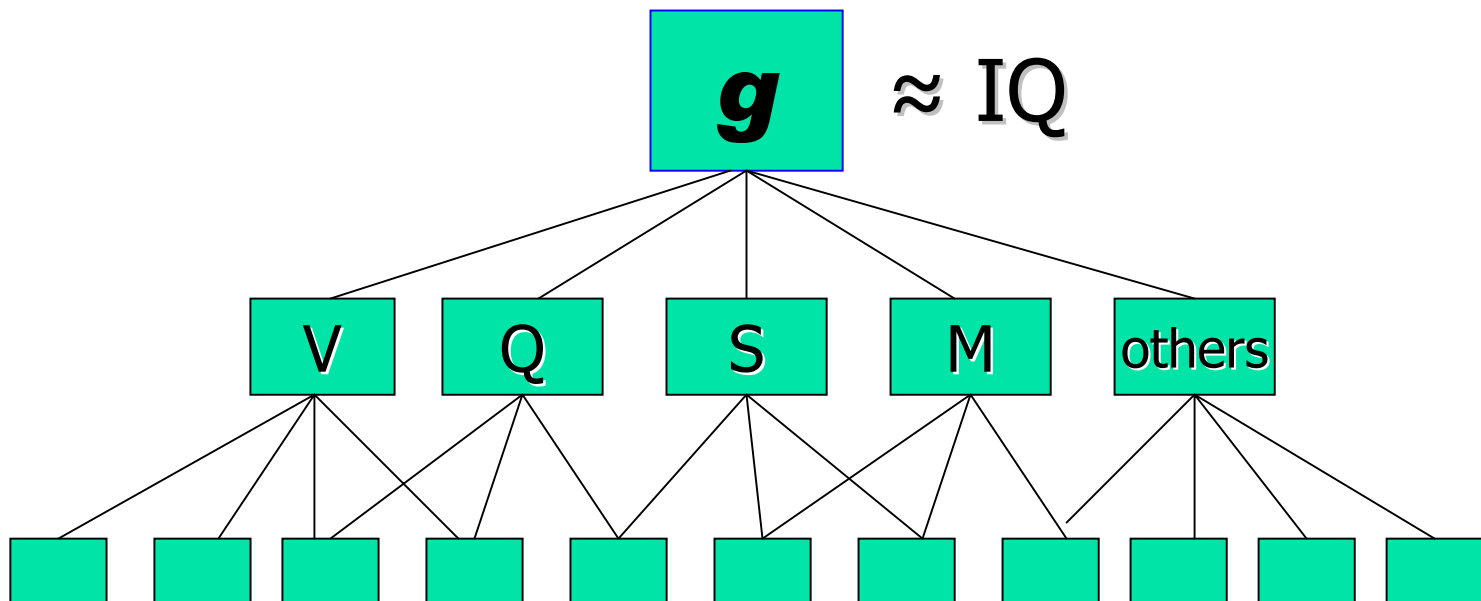
Five Key Facts

1. All mental tests measure mostly the same ability: *g*



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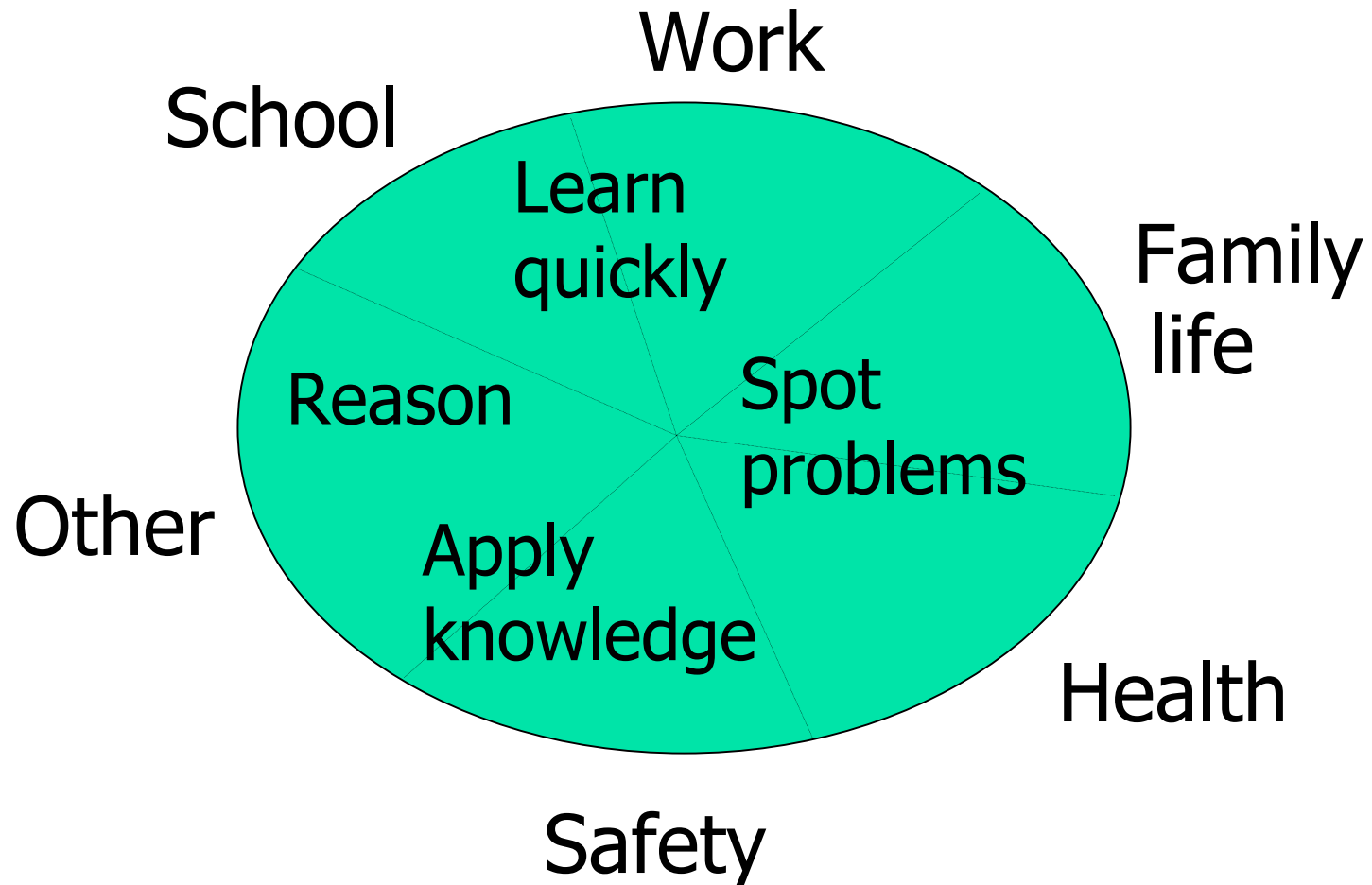




5 Key Facts

1. All mental tests measure mostly the same ability: g
2. g represents general thinking skills: learn quickly, think abstractly, spot & solve problems, etc.
3. Everyday life often requires these general skills
4. g predicts many life performances
5. BUT g predicts best where demands for general thinking skills are highest (most “ g loaded”)

In Sum, *g*-Loaded Tasks & Skills Cut Across Life Domains

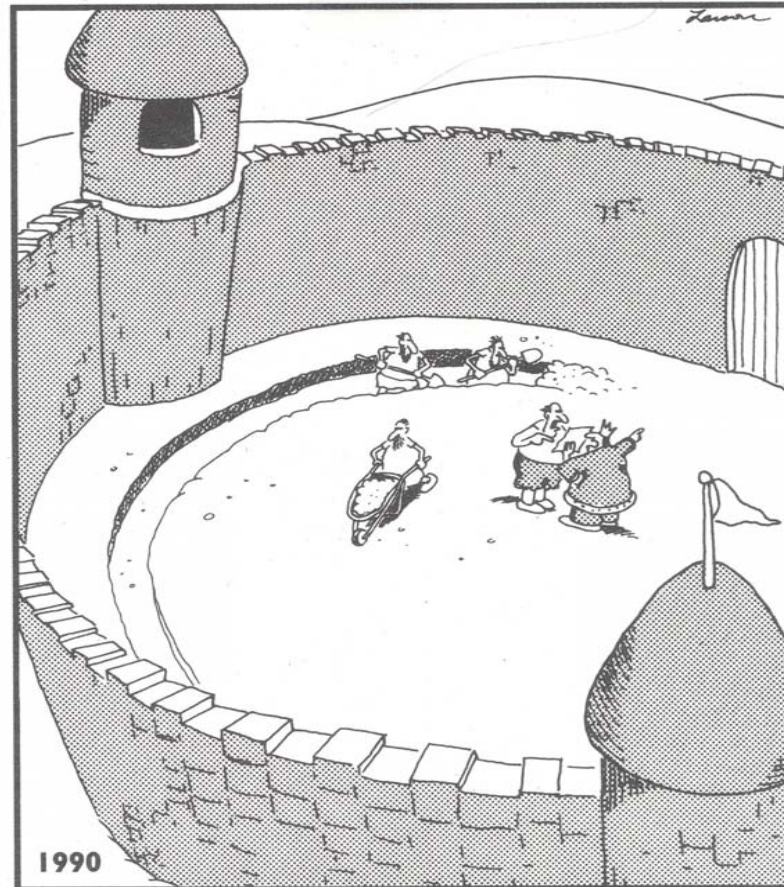




Everyday Life

- Work ←
- Daily commerce
- Illness
- Accidents

Planning, Spotting Problems



Suddenly, a heated exchange took place between the king and the moat contractor.



g Predicts Performance in All Jobs

Meta-analyses show that:


- *g* is best single predictor overall
- It has average (corrected) validity of .4-.5
- Its validity does not fade with experience

But also that...

Jobs Differ in Demands for g

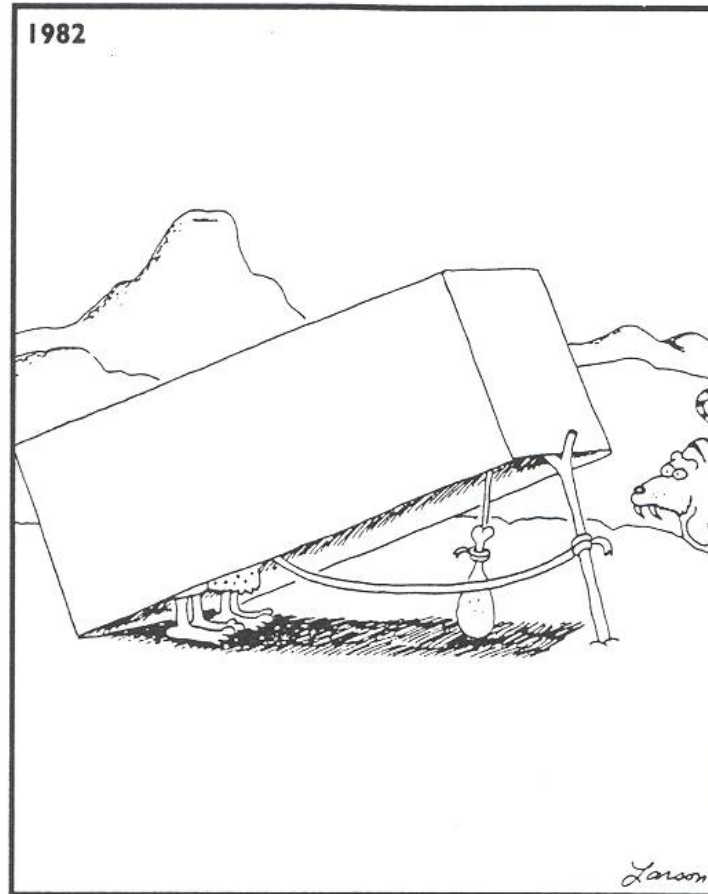
<u>Occupation</u>	<u>IQs: Middle 50%</u> (Applicants)	<u>Criterion validity</u> (Corrected)
Attorney, Engineer	108-128	<u>.80</u>
Teacher, Programmer	100-120	
Secretary, Lab tech	96-116	
Meter reader, Teller	91-110	
Welder, Security guard	85-105	
Packer, Custodian	80-100	<u>.20</u>

Attributes of Complex Jobs



Complex	r		
	.88	Self-direction	Combine information
Attorney	.86	Reason	Advise
	.85	Update knowledge	Write
	.83	Analyze	Plan
	.79	Lack of structure	Negotiate, Persuade
	.71	Criticality of position	Coordinate
			Instruct Parent?
	.51	Transcribe	
Teller	.36	Recognize	
	-.49	Repetitive	
	-.56	Physical exertion	
Custodian	-.73	Supervision	
Simple			

Plan, Anticipate Problems



"Shhhh, Zog! ... Here come one now!"

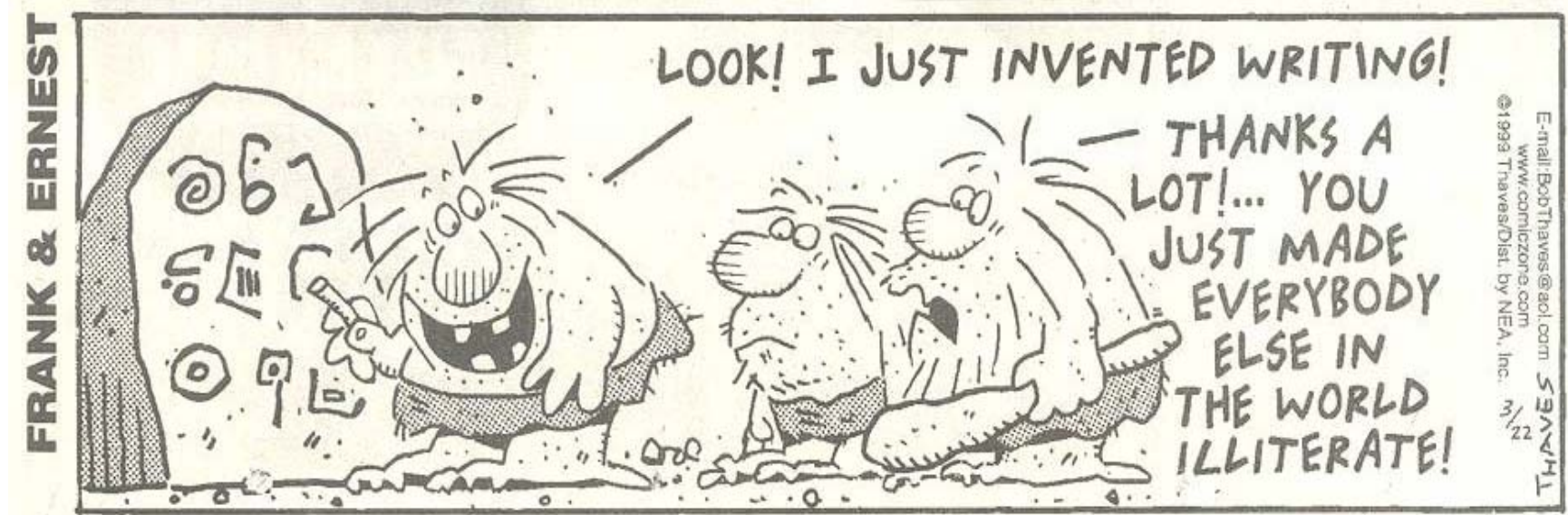


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Functional Literacy



Computer Literacy



"Okay your father
managed to get a mouse.
Now how do we use it?"



Everyday Literacy (NALS)

NALS Level	% pop. (white)	Simulated Everyday Tasks
5	4%	<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
4	21%	<ul style="list-style-type: none">▪ Use eligibility pamphlet to calculate SSI benefits▪ Explain difference between 2 types of employee benefits
3	36%	<ul style="list-style-type: none">▪ Calculate miles per gallon from mileage record chart▪ Write brief letter explaining error on credit card bill
2	25%	<ul style="list-style-type: none">▪ Determine difference in price between 2 show tickets▪ Locate intersection on street map
1	14%	<ul style="list-style-type: none">▪ Total bank deposit entry▪ Locate expiration date on driver's license

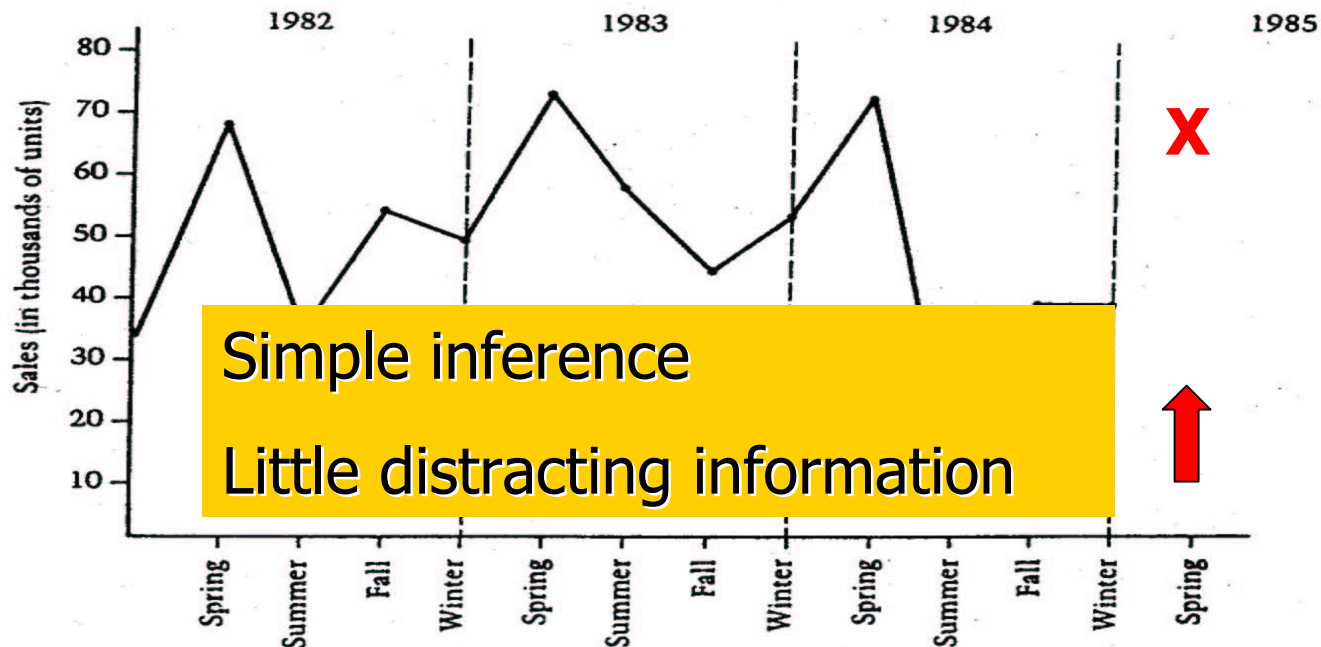


Everyday Literacy (NALS)

NALS Level	% pop. (white)	Simulat	<p>Difficulty based on “process complexity”</p> <ul style="list-style-type: none"> level of inference abstractness of info distracting information
5	4%	<ul style="list-style-type: none"> Use calculator to Use table of infor 	
4	25%	<ul style="list-style-type: none"> Use eligibility pan Explain difference 	
3	36%	<ul style="list-style-type: none"> Calculate miles pe Write brief letter 	
2	25%	<ul style="list-style-type: none"> Determine differe Locate intersection 	
1	14%	<ul style="list-style-type: none"> Total bank deposit Locate expiration 	

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.



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?

- More elements to match
- More inferences
- More distracting information



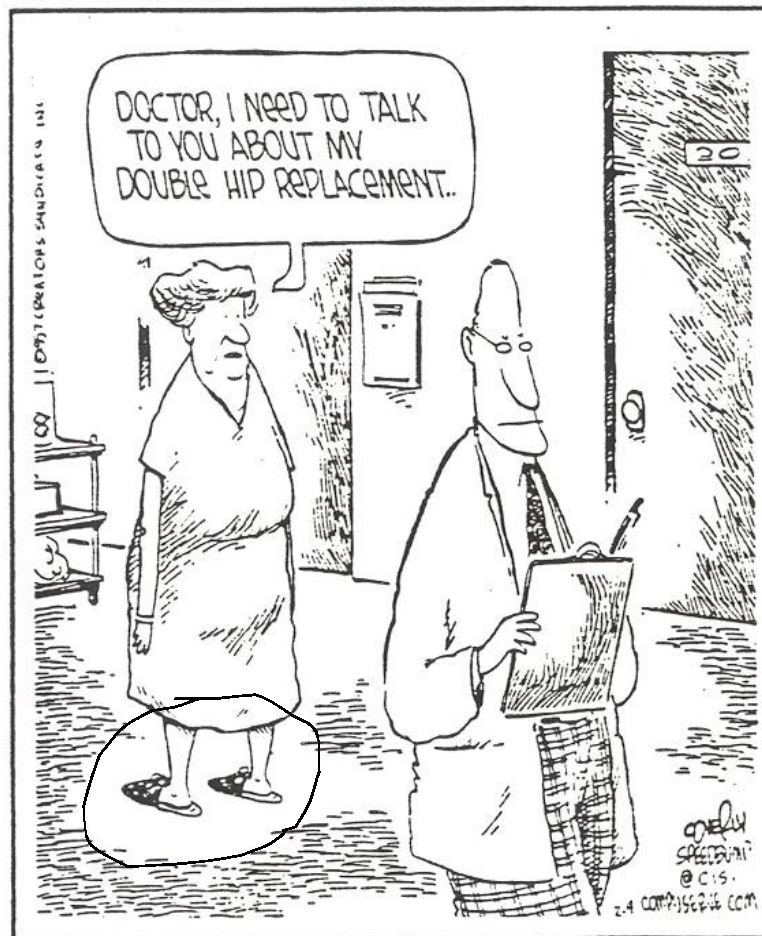
Everyday Life

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We All Want Smart Doctors

SPEED BUMP

DAVE COVERLY





But...

YOU Are Your Own
Primary Health Care
Provider



Example: Chronic Illnesses

- “Slow-acting, long-term killers that can be treated but not cured”
- Self-care is as important as medical care
- Require continued need “to learn,” “reason,” and “solve problems”

Chronic illnesses are demanding, long-term “careers.”



Chronic Illnesses Require Foresight & Prevention

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

State launches plan to stop rising rate of killer disease

About 15,000 in Del. don't know they're diabetic

By SEAN O'SULLIVAN
Staff reporter

Delaware health officials released a plan Tuesday they hope will help stop the rising rate of diabetes in the state by 2010, primarily through better education of adults and children, increased screening and by helping uninsured people treat the disease.

State officials estimate that 45,000 Delaware residents have diabetes, and that 15,000 of them do not know it because they have not been screened or diagnosed. Delaware has the fourth highest

diabetes death rate in the nation.

Diabetes is a disease that occurs when the body is not able to use sugar properly. Diabetes can cause adult blindness, kidney failure, heart disease and stroke, and require lower limb amputation.

The ailment occurs more often in women than men, more often in blacks than whites and more often among people older than 65. Those with a family history of diabetes also are at a greater risk, according to health officials.

The state's plan outlines a variety of strategies to avoid preventable cases of diabetes and help those who have the disease better treat it. Central to the plan is increased awareness through education and outreach in communities, schools and businesses, and expanded screening programs.

The plan's authors also hope by 2010 to provide coverage for diagnosis and treatment for 75 percent of people who have insurance or not enough to cover adequate care. The 54-page document is a follow-up to the "Burden of Diabetes," a report issued by the state in March documenting the extent of the diabetes problem in Delaware.

Lt. Gov. John Carney said Tuesday that the action plan should help Delaware qualify for \$800,000 in federal grants to implement

See DIABETES — B2



Registered nurse Bonnie Cunningham of Beebe Medical Center demonstrates the effect of high blood sugar on a person's veins.

Diabetes facts

Definition

Diabetes is a chronic disease that has no cure. Type 1 diabetes, in which the body does not produce any insulin, is most common in children and young adults. In Type 2, the body does not make enough insulin or properly use it to convert food to energy. Type 2 accounts for 90 percent to 95 percent of all cases.

Diabetes is the leading cause of blindness, end-stage kidney disease and non-traumatic lower limb amputations — amputations not caused by accidents. Diabetics are as much as four times more likely to have heart disease and suffer strokes.

Symptoms

- Frequent urination
- Excessive thirst
- Extreme hunger
- Unusual weight loss
- Increased fatigue
- Irritability
- Blurry vision
- Frequent infections

If you have one or more symptoms, see your doctor.

Who is most at risk?

- People with high blood pressure — at or above 130/85.
- People in a family with a history of diabetes.
- Mothers who had diabetes during pregnancy or had a baby weighing more than 9 pounds at birth.
- People who are overweight or obese.
- People who do not exercise much.

What to do

- Everyone older than 45 should be tested every three years.
- Those who are younger, but at higher risk, should consult with their doctors about starting screenings sooner and more frequently.

For information/help

- Call (800) 342-2383
- Visit the American Diabetes Association Web site at www.diabetes.org.

Sources: American Diabetes Association and the Centers for Disease Control and Prevention



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

Chronic Illnesses Require Self-Regulation to Limit Damage

Urban hospital outpatients: % diabetics <i>not</i> 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



Treatment Regimens Becoming More Complex

Heart attacks:

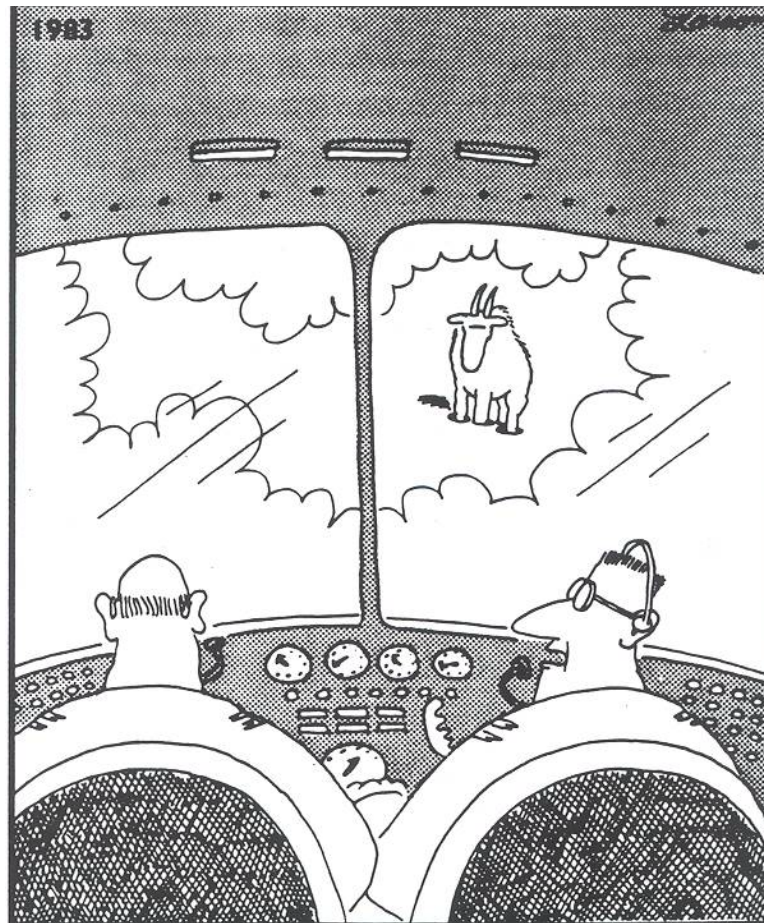
- 1960's—just “good luck”
- Now often includes:
 - regimen of aspirin, β -blocker, angiotensin-converting enzyme inhibitor
 - low-salt and low-cholesterol diet
 - Medicine to control hypertension, diabetes, & hypercholesterolemia
- “A patient’s ability to learn this regimen and follow it correctly will determine a trajectory toward recovery or a downward path to recurrent myocardial infarction, disability, and death.”



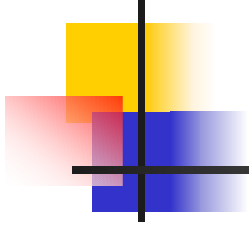
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We All Want Smart Pilots

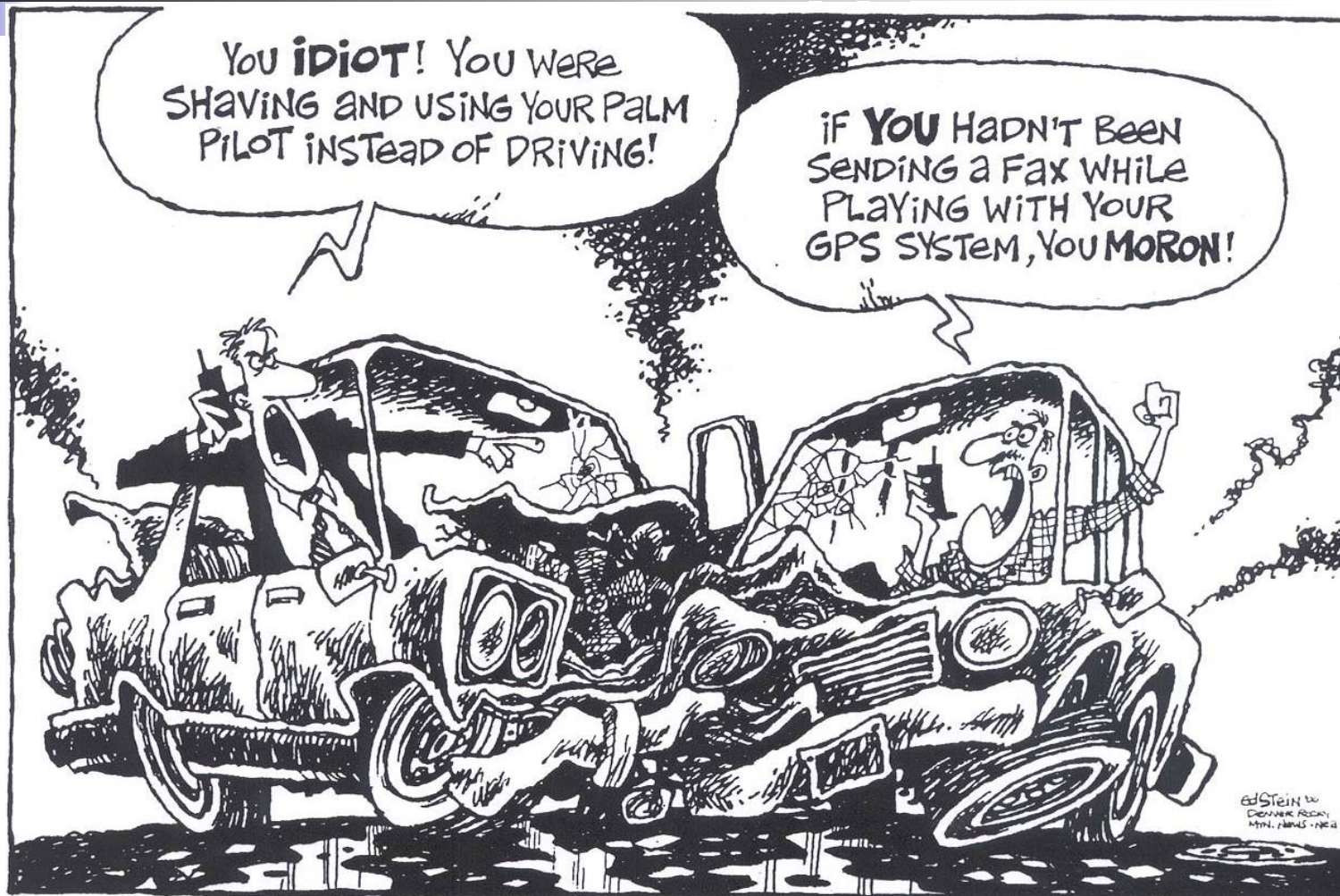


"Say ... what's a mountain goat doing way up here in a cloud bank?"



But...

Daily Life is Full of Hazards





Example: Motor Vehicle Fatalities

- IQ is best predictor

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.”



Life Requires “Defensive Driving” to Prevent Accidents

- Recognize hazards
- Prevent incidents starting
- Halt progress of incidents
- Limit damage during incidents
- Recover and redesign

Same process as with chronic illness.



Accident Prevention Also Resembles Complex Jobs

Complex jobs require you to:

r with complexity

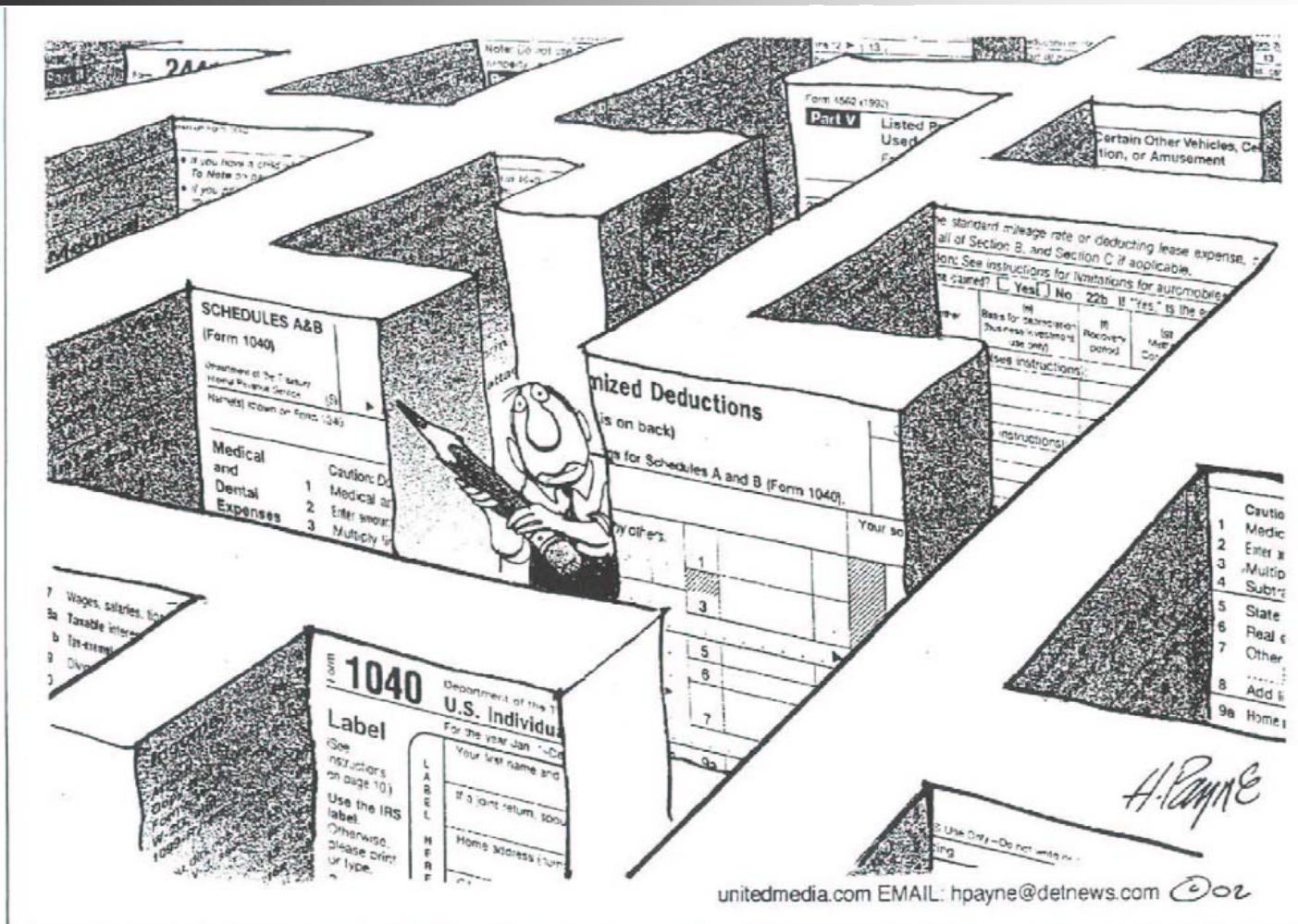
- | | |
|--|------------|
| ■ Learn and recall relevant information | .75 |
| ■ Reason and make judgments | .71 |
| ■ Deal with unexpected situations | .69 |
| ■ Identify problem situations quickly | .69 |
| ■ React swiftly when unexpected problems occur | .67 |
| ■ Apply common sense to solve problems | .66 |
| ■ Learn new procedures quickly | .66 |
| ■ Be alert & quick to understand things | .55 |



Future of Assessment

- Assess people's capabilities for self-care
 - More "authentic" tests
 - High *g*-risk populations (clinics, elderly)
- Assess life's demands for *g*
 - Task analyses of key life domains
 - More *g*-sensitive info/help
 - Reduce unnecessary complexity

Unnecessary Complexity?





Unnecessary Complexity!

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 NOTICE ANY SIGNS OR SYMPTOMS, 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 or worsen after 3 days, if new symptoms occur, or if redness or swelling 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 3 days, or if new symptoms are accompanied by a fever, headache, rash, nausea or vomiting, consult a doctor promptly. Do not take this product, unless directed by a doctor, if you have a breathing problem such as

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 enlargement of the prostate gland. May cause marked drowsiness; alcohol, sedatives and tranquilizers may increase the drowsiness effect. Avoid alcoholic beverages while taking this product. Do not take this product 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.

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.

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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.

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