

*turning knowledge into practice*

# Measuring Health Literacy Using a Skills Based Approach: Preliminary Results

Lauren McCormack, PhD, MSPH  
Health Literacy Annual Research Conference  
Washington, DC

October 19-20, 2009



*RTI International is a trade name of Research Triangle Institute*

3040 Cornwallis Road  
Phone 919-541-6277

■ P.O. Box 12194

Fax 919-990-8454

■ Research Triangle Park, North Carolina, USA 27709

e-mail Lmac@rti.org

[www.rti.org](http://www.rti.org)



# Objectives

- To create a publicly available health literacy instrument that can be used:
  - For population-based surveillance
  - To measure an individual's health literacy in intervention and research studies



# Project Overview

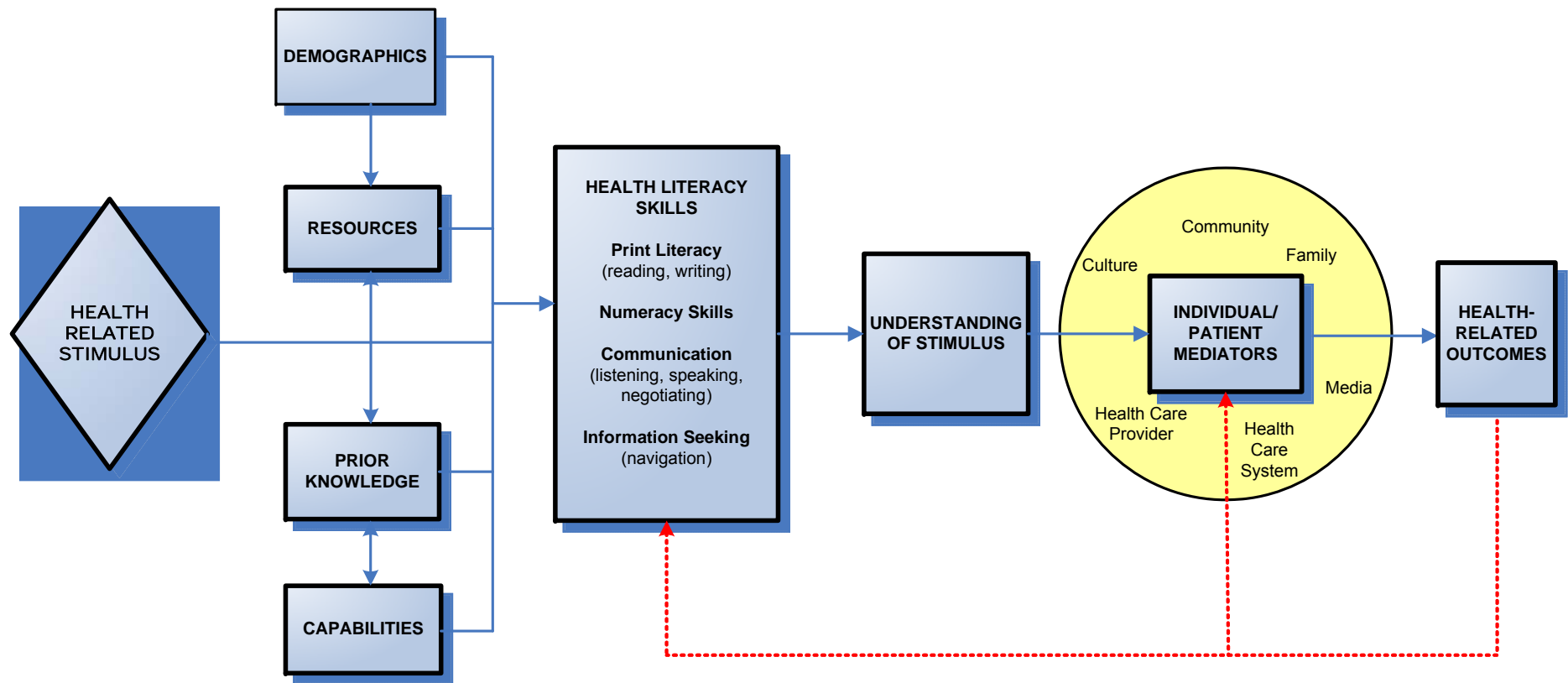
- 1) Develop conceptual framework for the instrument
- 2) Develop health literacy items
- 3) Cognitively test items
- 4) Pilot test items in a survey
- 5) Conduct psychometric and other analyses of pilot data

# What is Health Literacy?

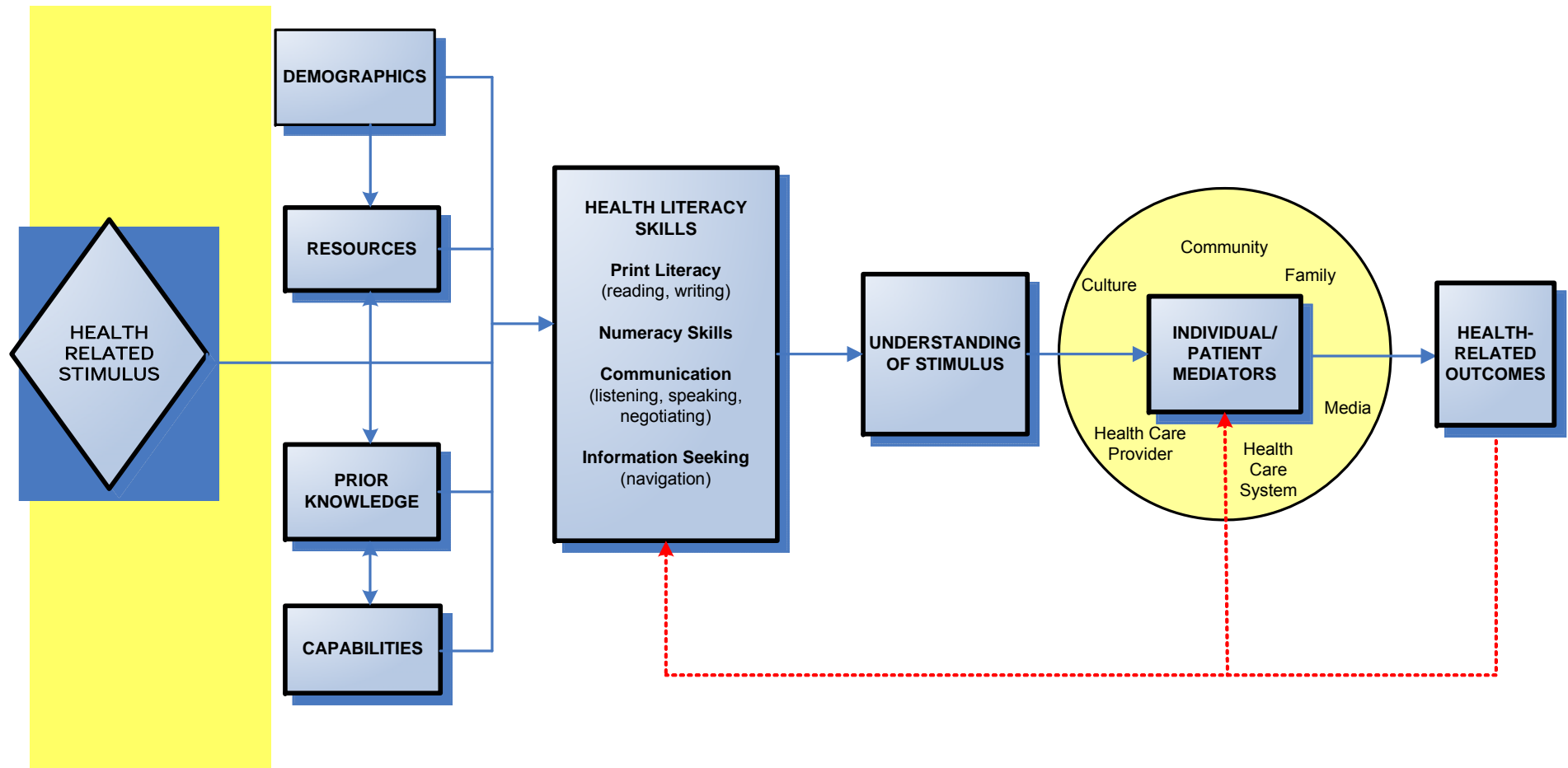
- Health literacy is not simply a function of basic literacy skills, but is “*dependent on individual and system factors, including communication skills of lay persons and professionals, lay and professional knowledge of health topics, culture, the demands of the healthcare and public health systems, and the demands of the situation/context.*” (Healthy People 2010)



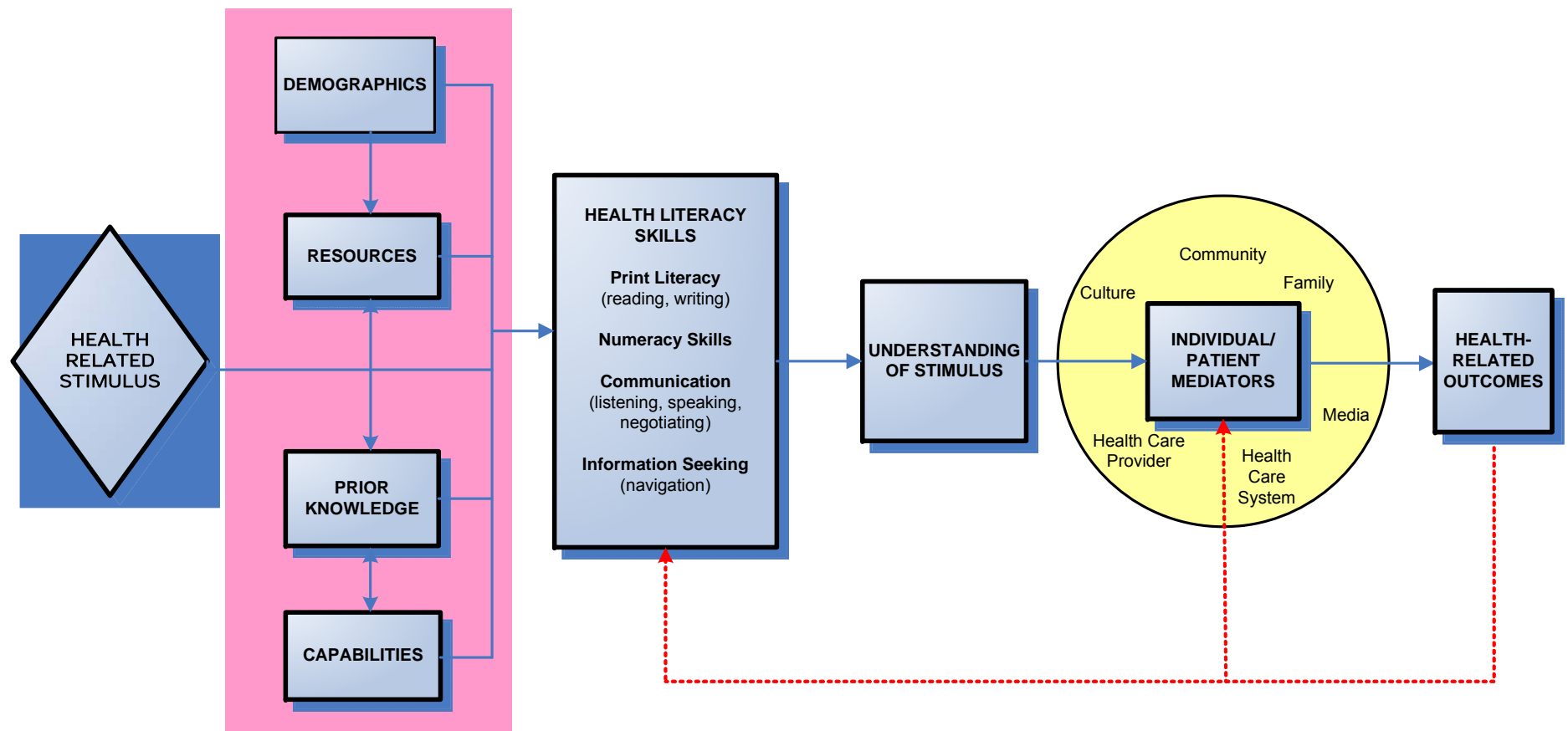
# Conceptual Framework for Individual Health Literacy



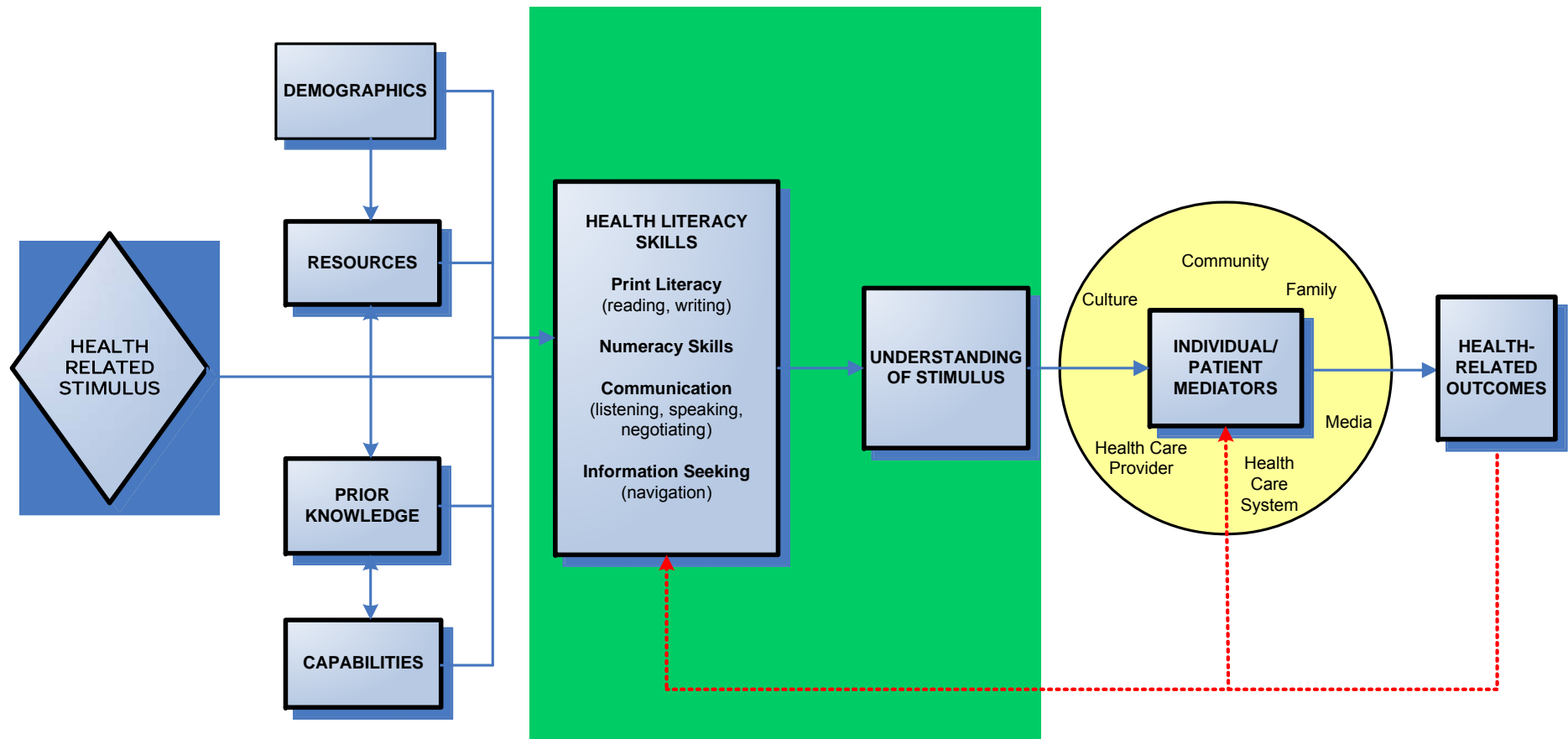
# Stimulus



# Influencers

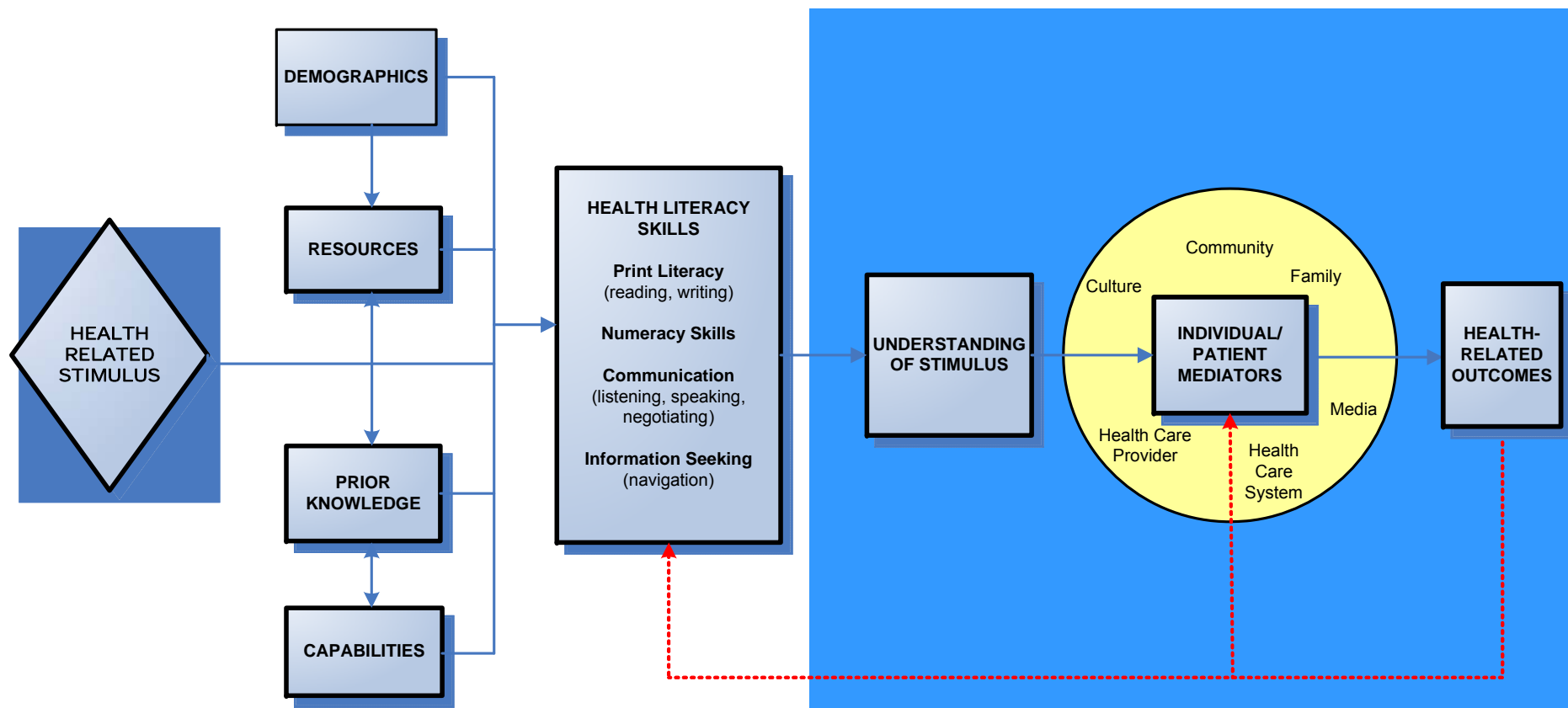


# Skills and Understanding





# Mediators and Outcomes



# Types of Stimuli

- Labels – food label, medicine label
- Newspaper article
- Map of a hospital, insurance statement
- Brochure, excerpts of text, bar graph
- Flow chart and tabular chart
- Automated telephone recording
- Videos and web sites

# Signs of a Stroke

## Signs of a Stroke

*My mother is alive today because a police officer knew the signs of a stroke. You can save a life, too, if you learn these signs.*

Mom was on her way to the dentist when a police officer noticed she was driving strangely and started to follow her. She pulled over on the highway. When the officer approached her, she told him she had a blinding headache. But she said that she had to get to her dentist appointment on time.

The officer also noticed that mom just wasn't acting right. Some of her speech was confused. And she was a little dizzy.

Mom said she felt fine, but that didn't stop the officer. He quickly called 911. That call saved my mother's life.

Knowing the signs of a stroke could help you save a life, too. Remember, some people have all of these signs, but my mom only had a few.

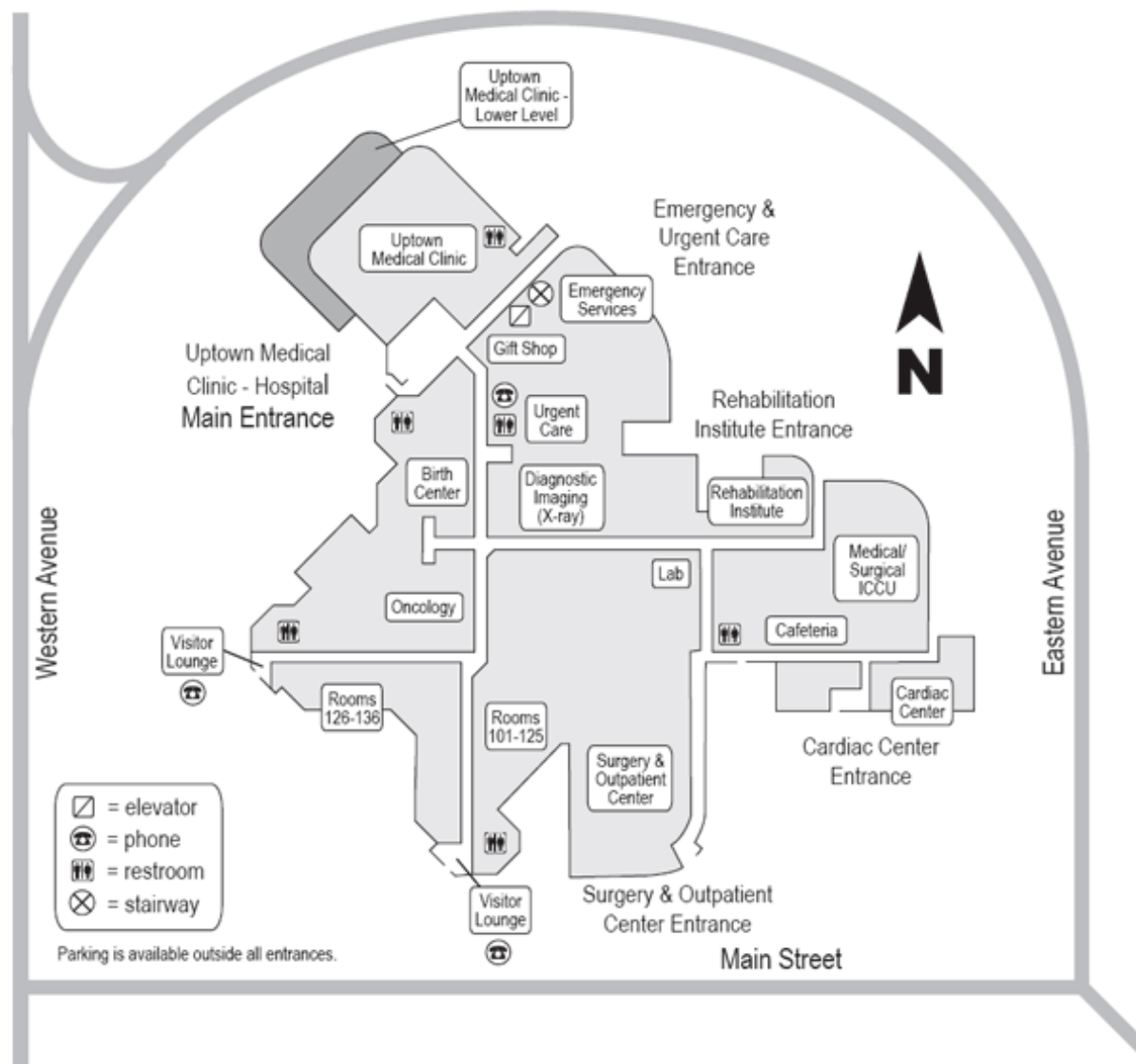
If you or someone else has even a few of these signs, get help fast!



### Five Signs of a Stroke

- Sudden numbness or weakness of the face, arm or leg, especially on one side of the body
- Sudden confusion, trouble speaking or understanding
- Sudden trouble seeing in one or both eyes
- Sudden trouble walking, dizziness, or loss of balance
- Sudden, severe headache

# Hospital Map





# Lunge Video

## 16. Lunge

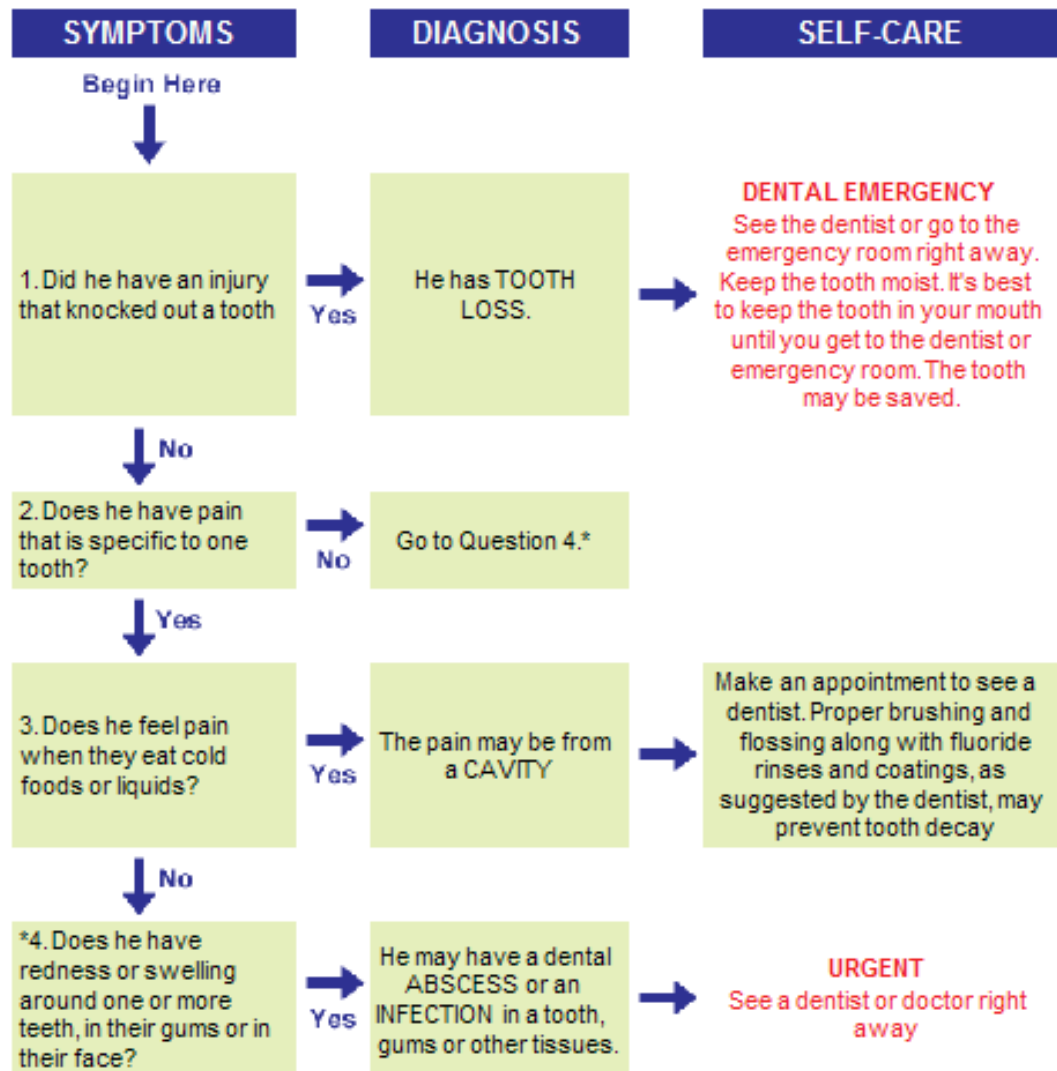
Please watch the video below before proceeding to the next screen.



# Decision Tree: Tooth Problems

## Tooth Problems

A tooth that causes ongoing pain may be a sign of a serious problem. Use this chart to determine if a person needs to see a dentist right away.



# Medicine Record

Be an Active Member of Your Health Care Team  
**My Medicine Record**



U.S. Department of Health & Human Services  
Food and Drug Administration



Name: \_\_\_\_\_

Birth date: \_\_\_\_\_

	What I'm Using Rx-brand & generic name; OTC-name & active ingredients	What It Looks Like color, shape, size, markings, etc.	How Much	How to Use / When to Use	Start / Stop Dates	Why I'm Using / Notes	Who Told Me to Use / How to Contact
<b>--- Enter ALL prescription (Rx) medicine (include samples), over-the-counter (OTC) medicine, and dietary supplements ---</b>							
Ex	XXXX/xxxxxxxxxx	20 mg pill; small, white, round	40 mg; use two 20 mg pills	Take orally, 2 times a day, at 8:00 am & 8:00 pm	1-15-06	Lowers blood pressure; check blood pressure once a week; blood test on 4-15-06	Dr. X (800) 555-1212
1							
2							
3							
4							
5							
6							
7							
8							

[www.fda.gov/usemedicinesafely/my\\_medicine\\_record.htm](http://www.fda.gov/usemedicinesafely/my_medicine_record.htm)

(888) INFO-FDA  
[www.fda.gov/usemedicinesafely](http://www.fda.gov/usemedicinesafely)

These are my medicines as of: \_\_\_\_\_

FORM FDA 3564 (8/07)

# Medicine Record: question

9b) In the example listed in the first row, what should the medicine pill look like?

Select one answer only



Don't Know





# Data Collection

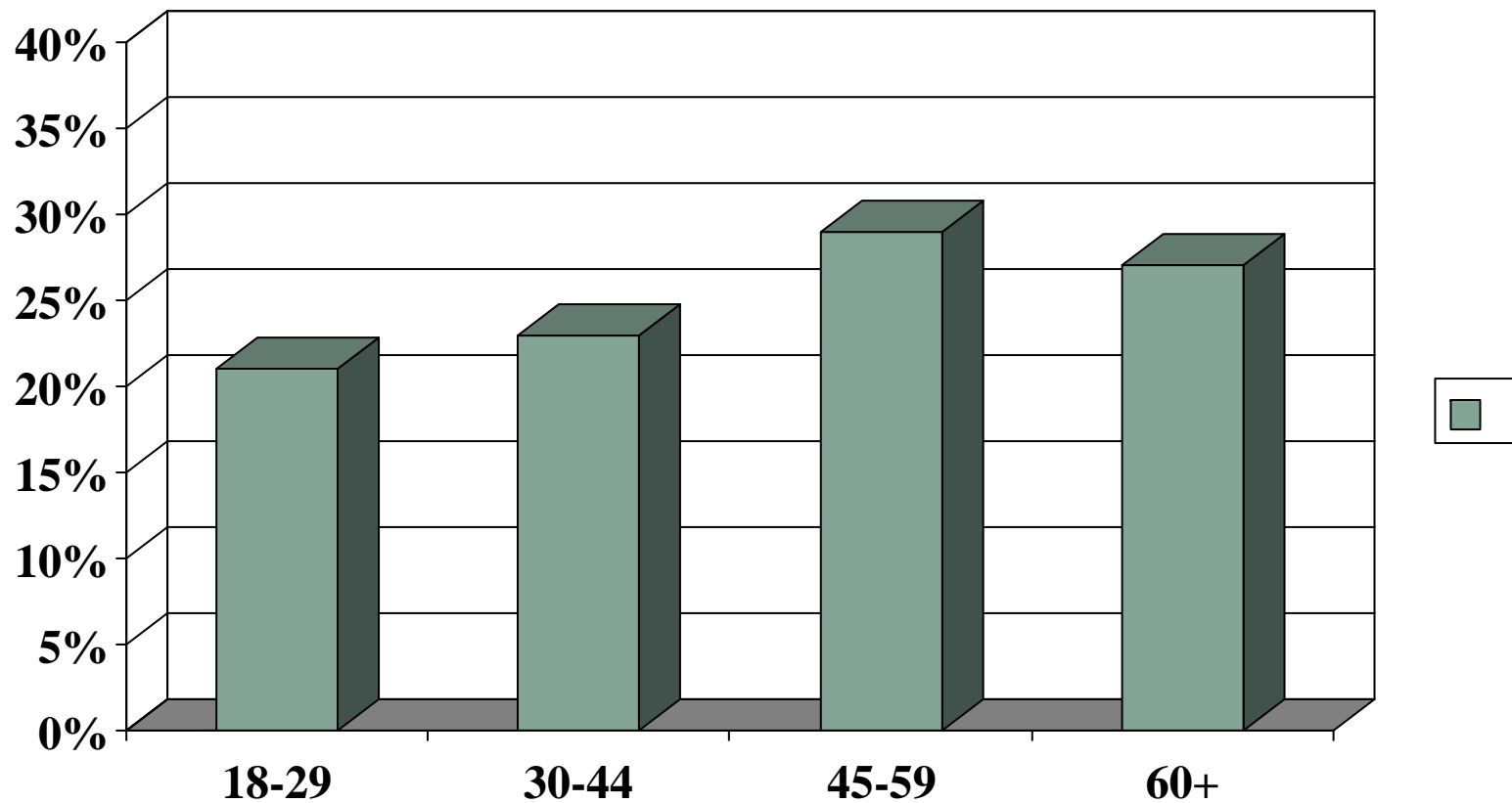
- Used web-based mode
- Nationwide on-line panel
- Combines probability-based random digit dialing and address-based sampling



# Quota Sampling

<b>Level of education</b>	<b>Proportion of total respondents (n = 810)</b>	<b>Preliminary data set (n = 682)</b>
8 <sup>th</sup> grade or less	10%	6% (n = 39)
9 <sup>th</sup> to 11 <sup>th</sup> grade	20%	25% (n = 170)
High school education	35%	36% (n = 247)
More than high school	35%	33% (n = 226)

# Age Distribution of Sample

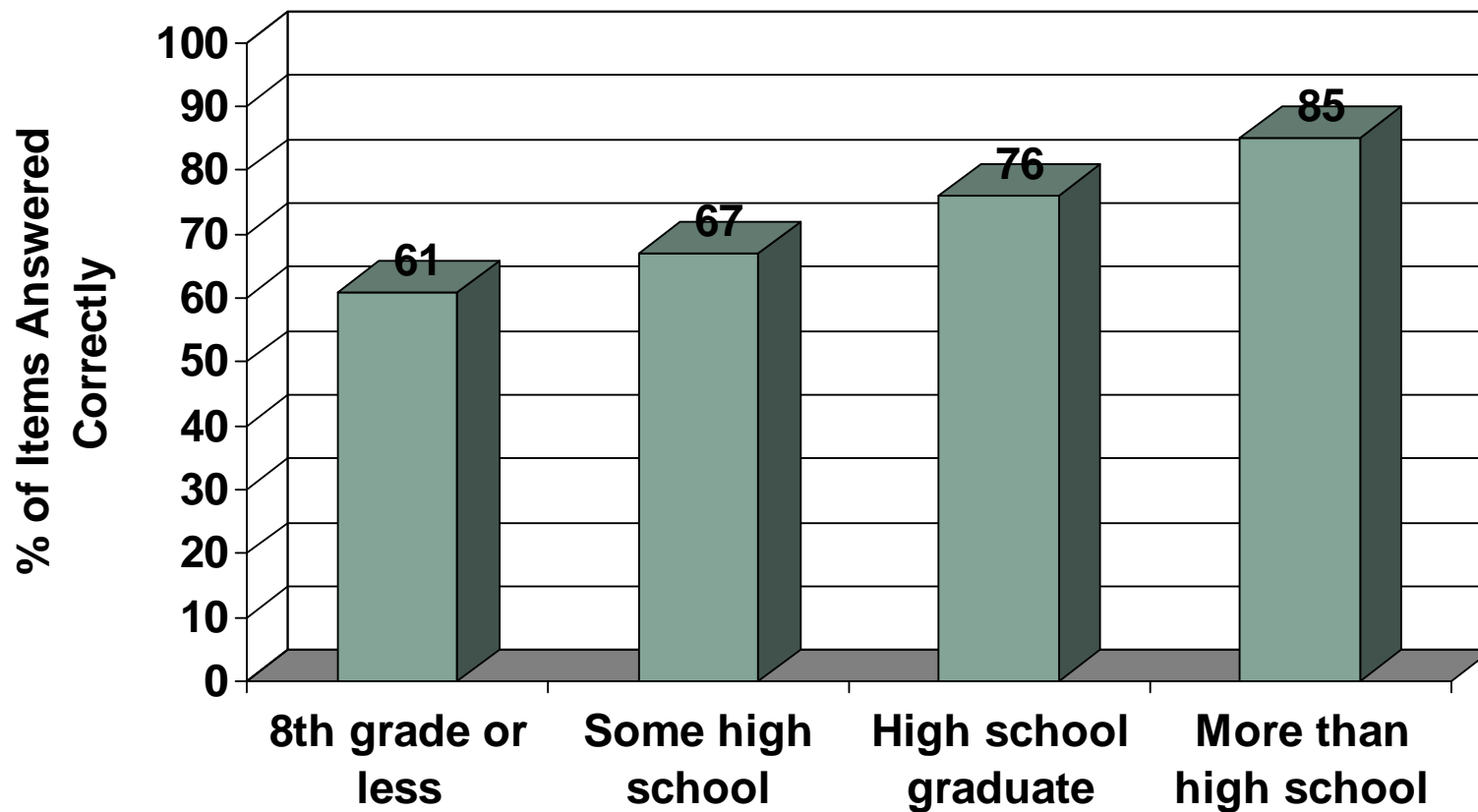


# Properties of the Health Literacy Scale

- Scale included 38 items
- Percentage of correct responses for items ranged from 22% to 96%
- On average, participants answered 76% of items correctly
- Cronbach's alpha = 0.89
- Correlation with S-TOFHLA:  $r = 0.50$



# Education Level



Note: Comparisons between all levels except 8<sup>th</sup> grade or less vs. some high school were significant at  $p < .001$

# Higher percentage correct

<b>Drug Facts</b>							
<b>Active ingredient (in each tablet)</b> Chlorpheniramine maleate 2 mg.....	<b>Purpose</b> Antihistamine						
<b>Uses</b> temporarily relieves these symptoms due to hay fever or other upper respiratory allergies: ■ sneezing ■ runny nose ■ itchy, watery eyes ■ itchy throat							
<b>Warnings</b> Ask a doctor before use if you have ■ glaucoma ■ a breathing problem such as emphysema or chronic bronchitis ■ trouble urinating due to an enlarged prostate gland Ask a doctor or pharmacist before use if you are taking tranquilizers or sedatives When using this product ■ drowsiness may occur ■ avoid alcoholic drinks ■ alcohol, sedatives, and tranquilizers may increase drowsiness ■ be careful when driving a motor vehicle or operating machinery ■ excitability may occur, especially in children 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.							
<b>Directions</b> <table border="1"><tbody><tr><td>adults and children 12 years and over</td><td>take 2 tablets every 4 to 6 hours; not more than 12 tablets in 24 hours</td></tr><tr><td>children 6 years to under 12 years</td><td>take 1 tablet every 4 to 6 hours; not more than 6 tablets in 24 hours</td></tr><tr><td>children under 6 years</td><td>ask a doctor</td></tr></tbody></table>		adults and children 12 years and over	take 2 tablets every 4 to 6 hours; not more than 12 tablets in 24 hours	children 6 years to under 12 years	take 1 tablet every 4 to 6 hours; not more than 6 tablets in 24 hours	children under 6 years	ask a doctor
adults and children 12 years and over	take 2 tablets every 4 to 6 hours; not more than 12 tablets in 24 hours						
children 6 years to under 12 years	take 1 tablet every 4 to 6 hours; not more than 6 tablets in 24 hours						
children under 6 years	ask a doctor						

<b>Drug Facts (continued)</b>
<b>Other information</b> ■ store at 20-25°C (68-77°F) ■ protect from excessive moisture
<b>Inactive ingredients</b> D&C yellow no. 10, lactose, magnesium stearate, microcrystalline cellulose, pregelatinized starch

What is the correct amount of medicine to give to a 7-year-old child? (92% correct)

- a. ½ tablet every 4 to 6 hours
- b. **1 tablet every 4 to 6 hours**
- c. 1 ½ tablets every 4 to 6 hours
- d. 2 tablets every 4 to 6 hours

Which of the following problems could be caused by this medicine? (82% correct)

- a. Trouble breathing
- b. **Drowsiness**
- c. Loss of appetite
- d. Trouble urinating

# Portion Control

## 14. Portion Control for Weight Loss

### Expanding portions

Are you eating a variety of healthy foods, exercising and still struggling with your weight? Some people may need to pay closer attention to portion control — managing the amount of food that they eat — as their total calorie intake determines their weight.

A serving isn't what they happen to put on their plate. It's a specific amount of food defined by common measurements, such as cups, ounces or pieces. The serving sizes represented here are part of the Mayo Clinic Healthy Weight Pyramid — a food pyramid designed to promote weight loss and long-term health. Use these serving sizes in conjunction with a diet based on a variety of healthy foods. Add the right amount of regular physical activity, and a person will be well on their way to enjoying good nutrition and controlling their weight.

### Vegetables

Until they're comfortable judging serving sizes, you may need to use measuring cups and spoons. A half a cup of cooked carrots, for example, equals one serving. Here are the recommended serving sizes for other vegetables:

Food	Serving size
Raw leafy vegetables	= 2 cups
Raw vegetables, chopped	= 1 cup
Chopped, cooked or canned vegetables	= 1/2 cup



### Meat and beans

Familiar objects can help a person picture proper portions for meat, poultry, fish and beans. For example, a 3-ounce serving of fish is about the size of a deck of cards. Here are the serving sizes for meat and meat substitutes:

Food	Serving size
Cooked skinless poultry or fish	= 3 ounces
Cooked lean meat	= 1 1/2 ounces
Cooked legumes or dried beans	= 1/2 cup or about the size of an ice cream scoop
Egg	= 1 medium





## Portion Control: 78% correct

14b) A person is cooking dinner for himself and he wants to include one serving from the meat and beans group. What should he choose?

Select one answer only

- ☐ 1 ½ ounces of cooked lean beef
- ☐ 1 ½ ounces of cooked fish
- ☐ 3 boiled eggs
- ☐ 1 cup of cooked kidney beans
- ☐ Don't Know



# Lower Percentage Correct

If a person is on a 2,500 calorie diet, what percentage of the daily value of saturated fat would he get from one serving? (22% correct)

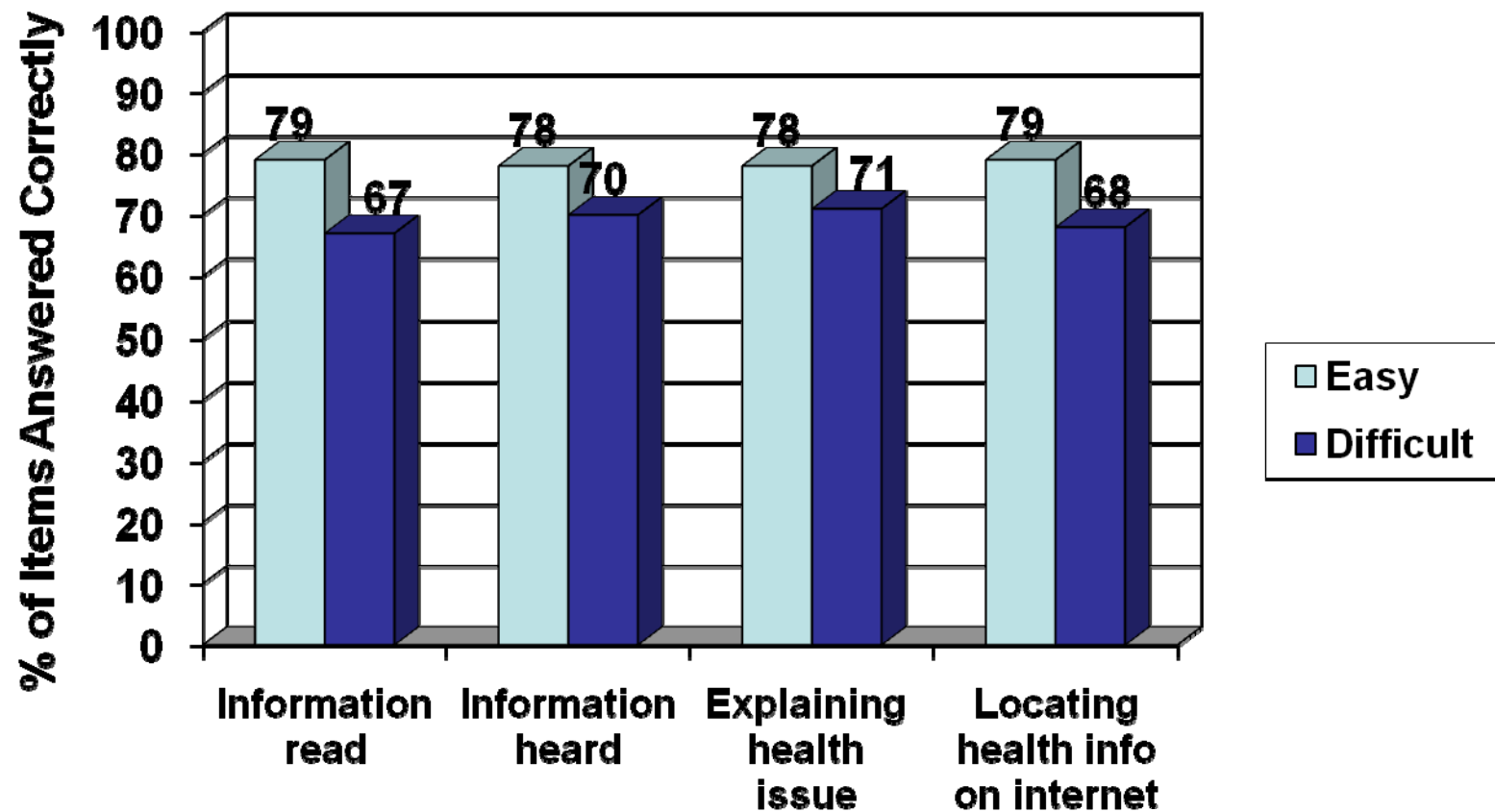
- a. 10 percent
- b. 11 percent
- c. 12 percent
- d. 13 percent

Nutrition Facts			
Serving Size 140 grams (140g)			
Servings Per Container 1			
Amount Per Serving			
Calories	140	Calories from Fat	70
%			
Total Fat 7g			
Saturated Fat 2.5g			
Trans Fat 0g			
Cholesterol 25mg			
Sodium 300mg			
Total Carbohydrate 9g			
Dietary Fiber 2g			
Sugars 3g			
Protein 8g			
Vitamin A 10% • Vitamin C 20%			
Calcium 4% • Iron 10%			

* Percent Daily Values are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs:			
	Calories:	2,000	2,500
Total Fat	Less than	65g	80g
Saturated Fat	Less than	20g	25g
Cholesterol	Less than	300mg	300mg
Sodium	Less than	2,400mg	2,400mg
Total Carbohydrate		300g	375g
Dietary Fiber		25g	30g

**Ingredients:** Tomatoes; Chicken; Mushrooms; White Wine; Celery; Onions; Green Bell Pepper; Flour; Butter; Olive Oil; Salt; Black Pepper.

# Self-Reported Measures



Note: Comparisons significant at  $p < .001$ .

# Challenges and Opportunities

- Conceptualizing health literacy
  - Moving forward with a common understanding of the construct?
  - Include both individual and societal level aspects?
- Choosing the right stimuli
  - Use real world materials? Update them over time?
- Measuring all aspects of health literacy at once and over time
  - Respondent burden, other data collection issues

# Acknowledgements

## National Cancer Institute

Grant # R01-CA115861-01A2

### RTI International team

- Lauren McCormack, PhD, MSPH, Principal Investigator
- Nancy Berkman, PhD
- Linda Squiers, PhD
- Carla Bann, PhD
- Claudia Squire, MS
- Rebecca Moultrie

### UCSF Center for Vulnerable Populations

- Dean Schillinger, MD

### Project Consultants

- Judith Hibbard, DrPH, and Janet Ohene-Frempong, MS