

Royal College Research Forum
Lies, damned lies, and surveys:
Designing better surveys for evaluation and research



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Territorial Acknowledgment



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This event is an Accredited Group Learning activity (Section 1) as defined by the
Maintenance of Certification Program of the Royal College



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Conflict of Interest Declaration

Anthony R. Artino, Jr., PhD

Is a survey consultant for the Accreditation Council for Graduate Medical Education (ACGME).

Elsevier: receives royalties from Elsevier for the textbook edited on survey design.

Tanya Horsley, PhD, MBA


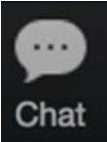



Is a salaried employee of the Royal College of Physicians and Surgeons of Canada.

Guyline Lefebvre MD, FRCSC

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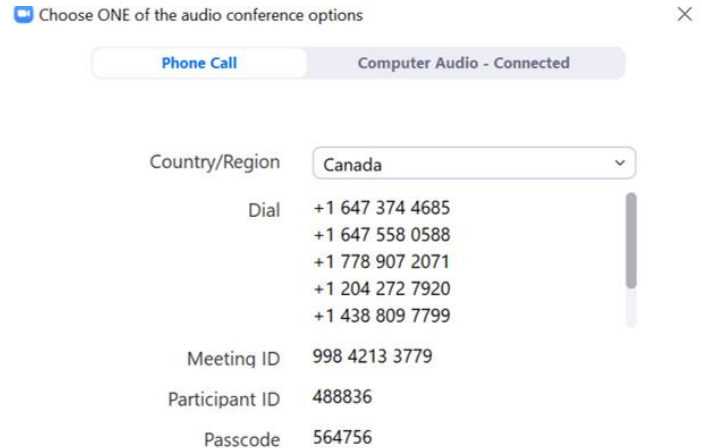
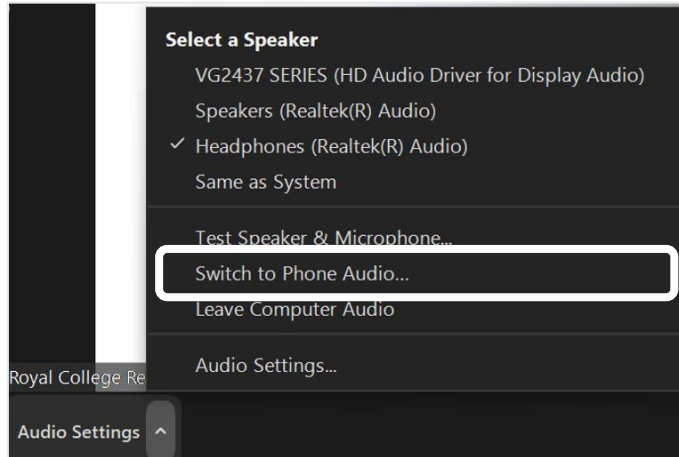
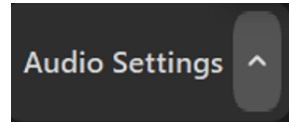
Royal College Research Forum

Before the Event	During the Event	After the Event
 <p>You have been automatically muted</p>	 <p>Use chat function to submit questions</p>	 <p>An event evaluation will circulated to all participants</p>
 <p>Your camera cannot be activated</p>	 <p>The session will be recorded</p>	
<p>For technical support, email: researchunit@royalcollege.ca</p>		

Switching to Phone Audio

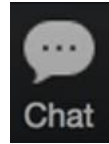
Experiencing issues with your computer audio? Here is how to connect via your phone:

- 1) Click the up-caret symbol near “Audio Settings”
- 2) Select “Switch to Phone Audio”
- 3) Call number provided



Submitting questions

To submit:



- 1) Open the **Chat** feature by clicking
- 2) Within the **Chat** panel, within the **To** drop-down list, please select “*Everyone*”



- 3) Press **Send**.



Guylaine Lefebvre MD, FRCSC

Executive Director

Membership Engagement and Programs

Royal College of Physicians and Surgeons of Canada



Somewhat
Satisfied



Very
Satisfied



Lies, Damned Lies, & Surveys

Designing Better Surveys for Evaluation & Research

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@MedEdDo

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THE GEORGE
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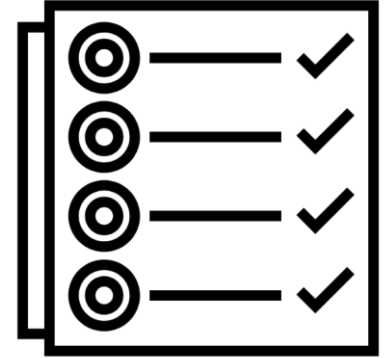
“There are three kinds of lies: lies, damned lies, and statistics.”

– Mark Twain (1906)



Learning Objectives

BY THE END OF THIS SESSION, YOU WILL BE ABLE TO...



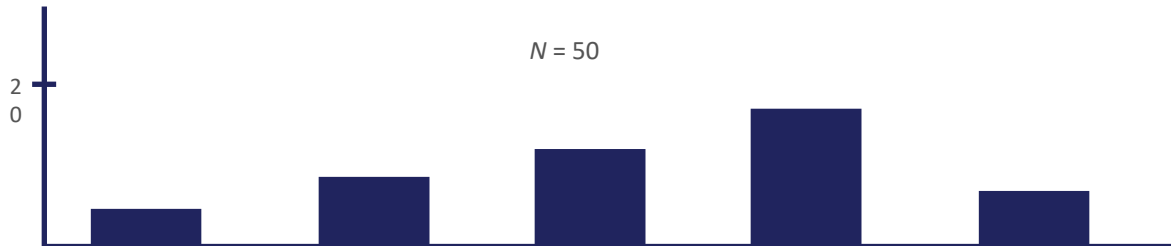
- **Recognize** the elements of a survey;
- **Describe** how cognitive processes and motivation guide the way people understand and respond to survey questions;
- **Identify** poorly written survey items and other design pitfalls;
- **State** several design principles; and
- **Identify** the importance of conducting expert reviews and cognitive interviews.

Consider this...

Your opinion is that the global economy is the second most important issue in the world today.

The global economy is the most important issue in the world today.

strongly disagree	disagree	neither agree nor disagree	agree	strongly agree
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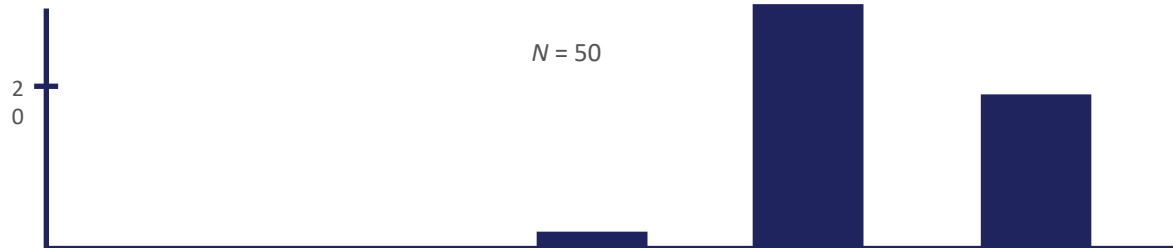
Consider this...

Your opinion is that the global economy is the second most important issue in the world today.

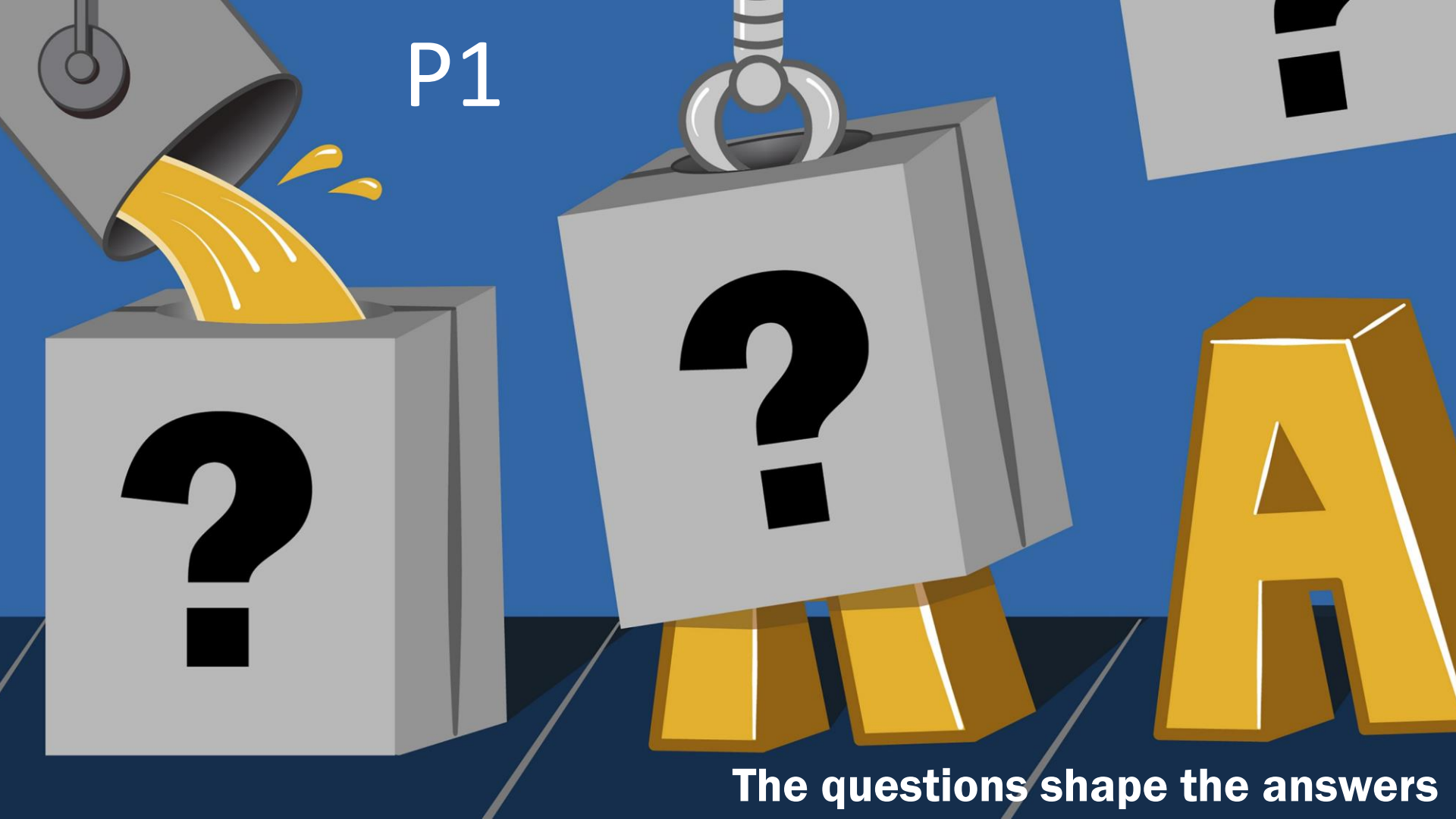
vs.

How important is the issue of the global economy in the world today?

not at all important	slightly important	moderately important	quite important	extremely important
----------------------	--------------------	----------------------	-----------------	---------------------



P1



The questions shape the answers

Agenda

Large-Group Activity:
Identifying
(potentially)
Problematic Items

A Systematic
Design Process

Terminology

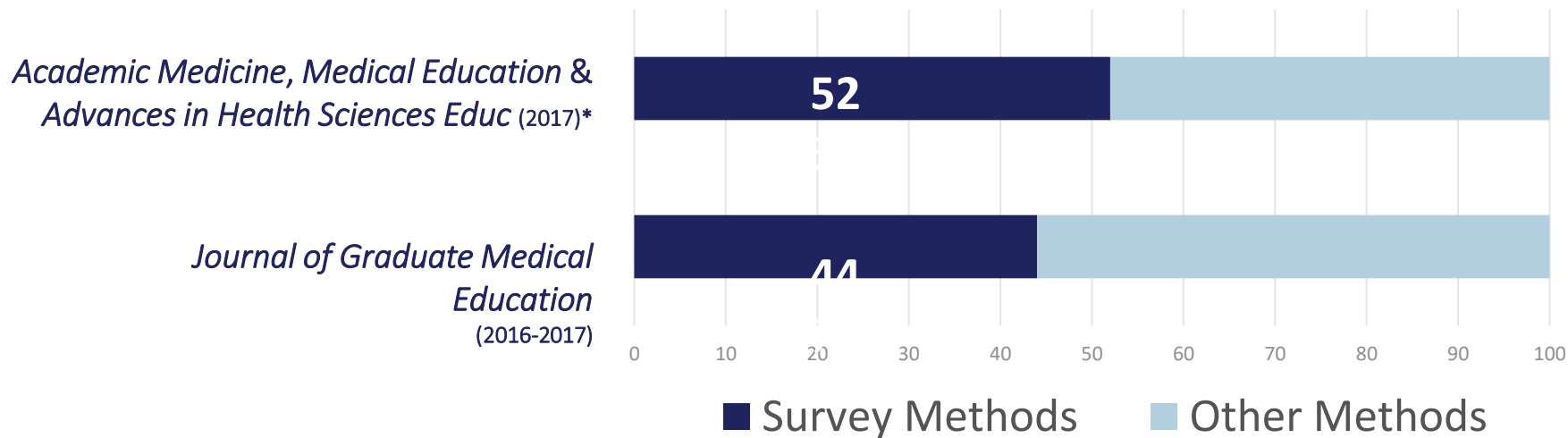


Cognitive & Motivational Processes

Principles & Design Guidelines
To Improve Survey Quality

Survey Prevalence

HOW OFTEN ARE THEY USED?



Survey Terminology



- **Construct**
 - A model, idea, or theory (something “constructed”)
 - e.g., competence, resilience, confidence, patient satisfaction, motivation, perceived barriers, interest, procrastination, well-being, instructional quality, burnout, etc.
- **Items (or “indicators”)**
 - Individual questions/statements on the survey
- **Scale**
 - 2 or more items intended to measure a construct

Survey Terminology



- **Response options (aka, “response anchors”)**
 - All the named points along the “response scale”

Unipolar	not at all important	slightly important	moderately important	quite important	extremely important
	almost never	once in a while	sometimes	often	almost all the time
Bipolar	strongly disagree	somewhat disagree	neutral	somewhat agree	strongly agree
	very dissatisfied	somewhat dissatisfied	neither satisfied nor dissatisfied	somewhat satisfied	very satisfied

Fauci Response Options



How are you feeling today?



ITEMS

CONSTRUCT

RESPONSE
OPTIONS



Customer Service Questionnaire
Please help us improve our services by answering the questions below. We are interested in your opinions about the recent service you received from the Reading Fire Department

Please circle your response

SCALE



Very Satisfied	Satisfied	Adequate	Unsatisfied	Very Unsatisfied
----------------	-----------	----------	-------------	------------------

1. Were our personnel polite and courteous?	5	4	3	2	1
2. Did our personnel take care of you in a professional manner?	5	4	3	2	1
3. Did we explain the services you needed in an understandable manner?	5	4	3	2	1
4. Did we answer all of your questions in an understandable way?	5	4	3	2	1
5. Overall, how satisfied were you with the service you received from us?	5	4	3	2	1

A. Did you have any other concerns, related to your emergency, that you felt was not addressed by our personnel?

B. Please tell us the single most important action we took that made you feel better.

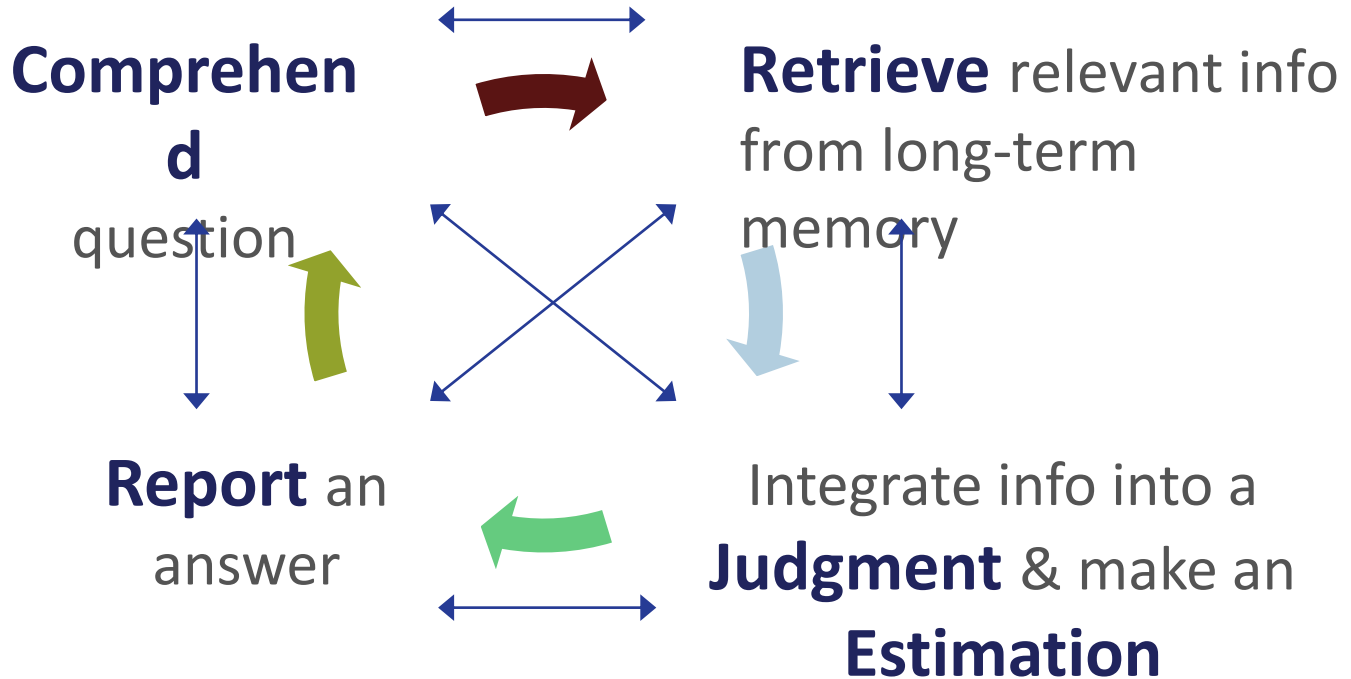
C. What could we have done differently that might have made your experience more positive?

A great deal of cognitive work is required to generate optimal answers to a survey



Cognitive Processing

COGNITIVE PROCESSES & SURVEY RESPONSE



Comprehension

RESPONSE PROCESS MODEL

Comprehend question

Common problems:

Lexical – What do the individual words mean?

Semantic – What does overall question mean, literally, when those words are assembled?

Pragmatic – What did the author of the question intend for me to understand/do?



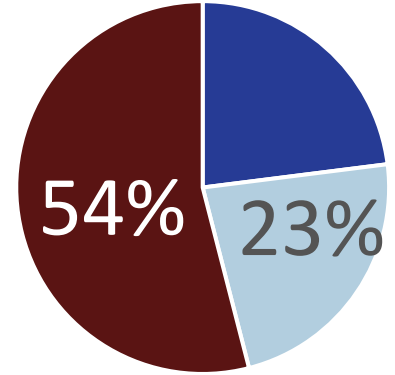
Comprehension

RESPONSE PROCESS MODEL

Comprehend question

Lexical – Words can have many interpretations and meanings, even for the same person

Suessbrick et al. (2000): Tobacco use study...



■ Only cigarettes you finished

“Have you smoked at least 100 cigarettes in your entire life?”

Reporting

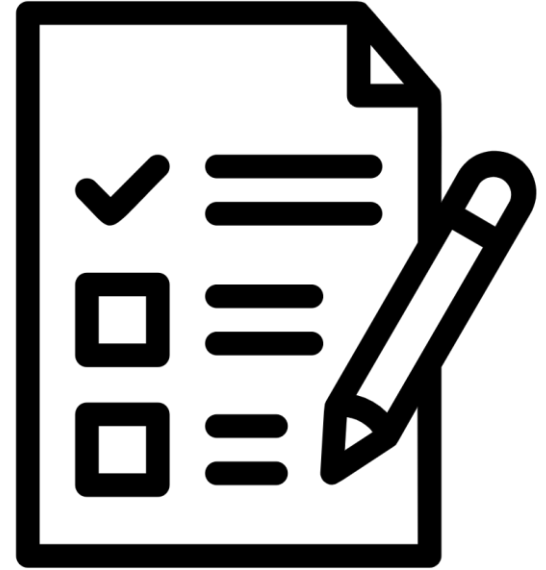
RESPONSE PROCESS MODEL

Report an answer

Edit response for...

Consistency with prior answers and/or with self-concept

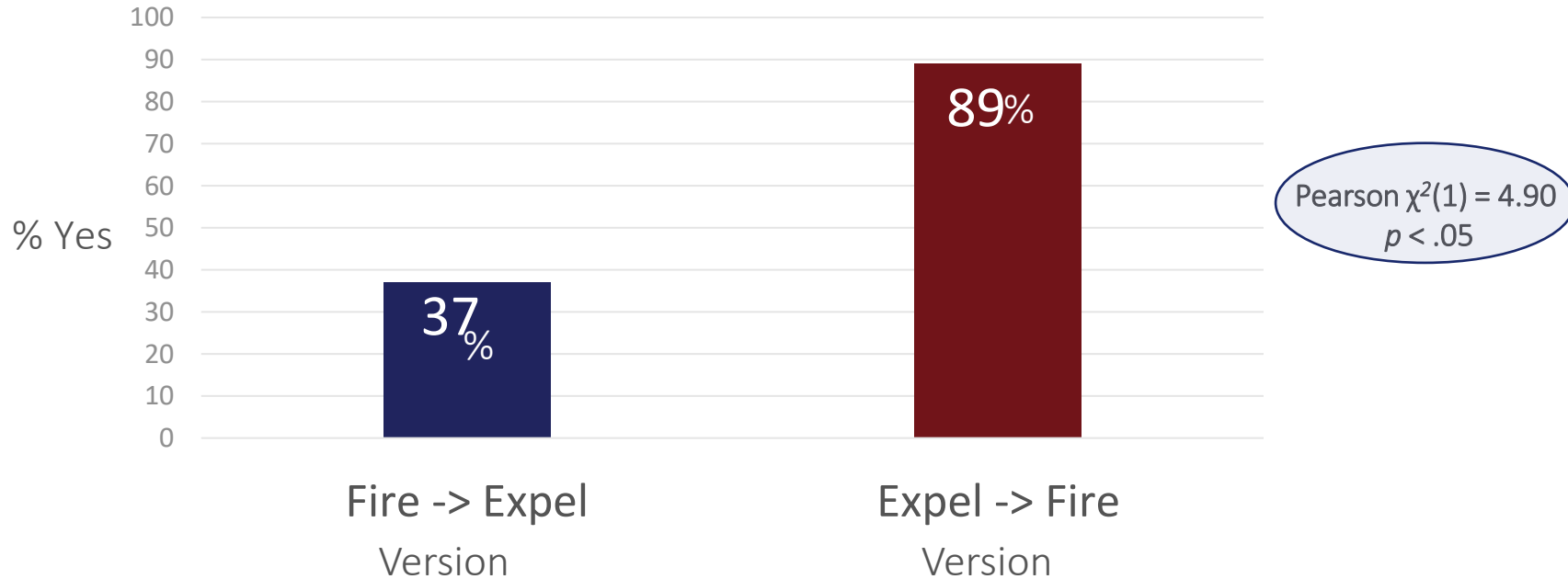
Acceptability with what's socially desirable (*social desirability bias*)



Reporting

N = 91
Faculty

% of Faculty Who Answered:
“Yes, Fire the Professor”



Design Guidelines

- Use terms that most people interpret the same way
- Provide definitions of terms/ideas that could be interpreted in different ways
- Be aware of order effects
- Always PRETEST your surveys!!!**



P3

Respondents are generally unmotivated to take your survey

Principle #3

RESPONDENTS ARE GENERALLY UNMOTIVATED TO TAKE YOUR SURVEY



You want your respondents to optimize

- The extent to which respondents perform the necessary cognitive tasks to answer a survey item in a thorough/unbiased manner

You don't want them to satisfice

- The extent to which respondents compromise their standards and expend less energy (i.e., don't put forth their full effort to answer truthfully or thoughtfully)

Please use the following rating scale (write "0" if unable to judge):

1	2	3	4	5
Unacceptable	Significantly below most PGY-3s	On par with most PGY-3s	Better than most PGY-3s	Consistently at least one level higher than almost all PGY-3s

Not applicable

Patient Care

- 3 Conducting patient histories
- Physical exam skills
- Conducting daily patient evaluations
- Performing basic technical skills (e.g., inserting IV, suturing, inserting a-line)
- Performing advanced procedural skills (e.g., inserting central line, performing endoscopy, operating room performance)
- Analysis of clinical data, differential diagnosis and selection/interpretation of tests
- Ability to manage and/or refer patients with life threatening illness
- Ability to manage patients with complex multi-system illness
- Knowledge and selection of treatment options/patient management
- Coordination and continuity of care
- Ability to appreciate a patient's illness in the context of their life

Communication and Interpersonal Skills

- 3 Oral communication skills
- Written communication skills
- Relationships with patients
- Relationships with families
- Relationships with peers, staff and other health-care personnel
- Effectiveness as a teacher

Factors That Predict Satisficing

$$\text{Satisficing} = \frac{\text{Task Difficulty}}{\text{Assume fixed Ability} \times \text{Motivation}}$$

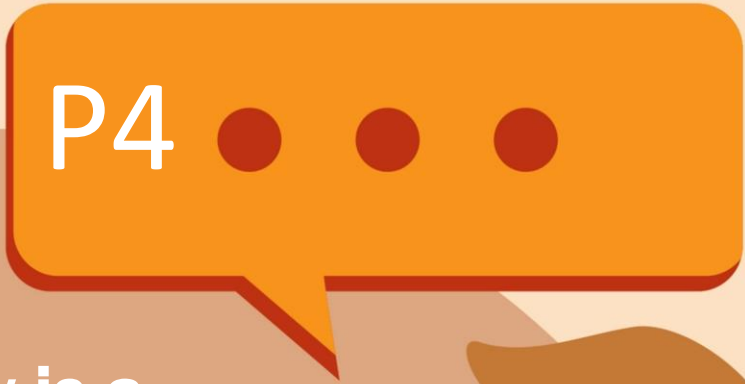
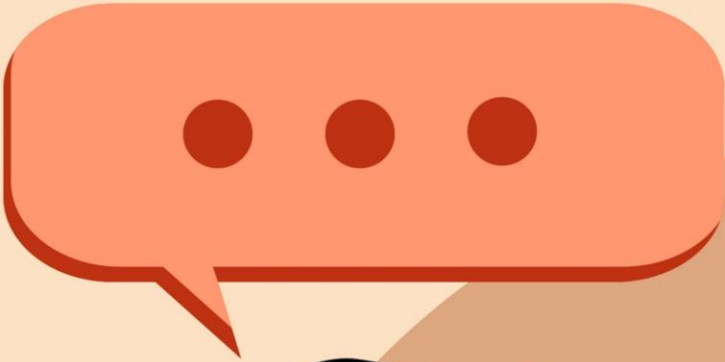
- How easy is it to get through the four cognitive processes?
 - o i.e., how well-designed is the survey?
- Distractions?
- Clear instructions?

- To what degree does the survey address **rewards**, **cost**, and **trust**?
- Respondent fatigue?

Design Guidelines

STRATEGIES FOR ADDRESSING RESPONDENT MOTIVATION

Increase Rewards/Benefits	Decrease Costs	Establish Trust
Provide info about survey	*Make it convenient	*Obtain sponsorship
Ask for help or advice from respondents	Avoid subordinating language	Provide token of appreciation in advance
*Show positive regard	*Make it short and sweet	*Make task appear important
*Say thank you	Minimize requests for personal info	Ensure confidentiality and security
Support group values	Emphasize similarity to other tasks	
Give tangible rewards		
Make survey interesting		
Provide social validation		



**A survey is a
conversation
between you and
your respondents**



GRICEAN MAXIMS FOR EFFECTIVE CONVERSATIONS

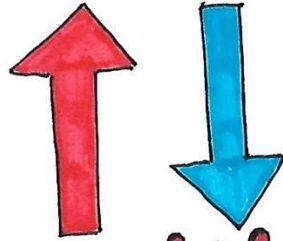
SKETCHNOTE BY HAYLEY LEWIS @Haypsych June 2020



Quality

"BE TRUTHFUL"

- don't say what you believe to be false
- don't say that for which you lack evidence



Quantity

- make your contribution as informative as needed
- don't make your contribution more informative than is needed



Relevance

- be relevant
- pay attention as relevance may change during an interaction

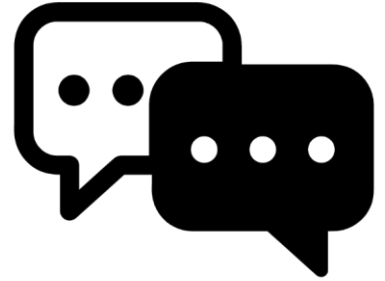


Manner

"BE CLEAR"

- avoid obscurity of expression
- avoid ambiguity
- be brief
- be orderly

Principle #4



A SURVEY IS A CONVERSATION BETWEEN YOU AND YOUR RESPONDENTS

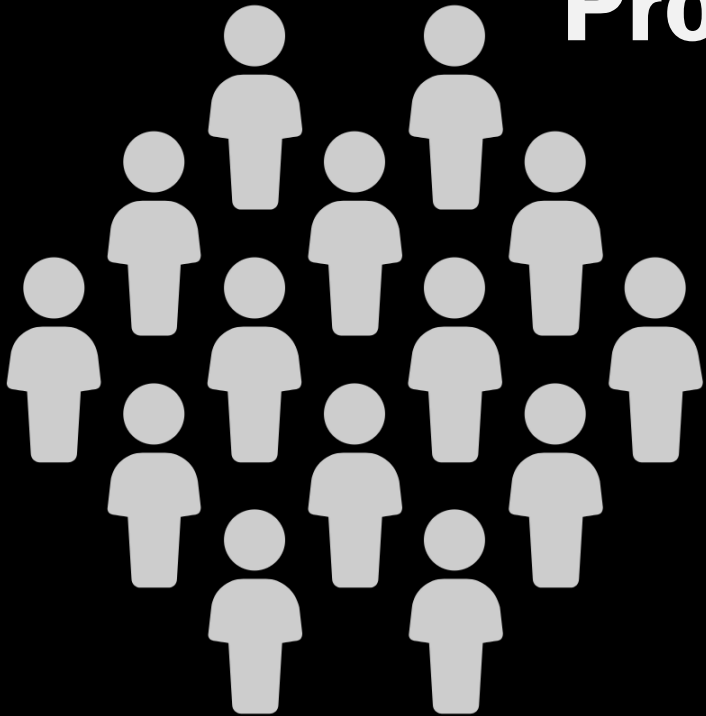
To what extent do you favor or oppose the university's 'Maximally Accessible Materials' (MAM) policy to make all printed materials at the school available upon request in enlarged font form for the visually impaired?

strongly oppose	moderately oppose	slightly oppose	neither favor nor oppose	slightly favor	moderately favor	strongly favor
-----------------	-------------------	-----------------	--------------------------	----------------	------------------	----------------

- Total $N = 17$
- Mean = 5.1
- 8 said “neither favor nor oppose”
- 6 said “slightly favor” or “moderately favor”
- 3 said “strongly favor”
- **NO MISSING DATA!!!!**



Identifying (potentially) Problematic Survey Items (large-group activity)



Item #1

MULTI-BARRELED ITEMS

Best Practice: Ask one question at a time (avoid multi-barreled items)



- **Example Item:** *How effective was the didactic and bedside instruction?*
 - What if one is good and the other is bad?
- **Solution: split into two items**
 - *How effective was the didactic instruction?*
 - *How effective was the bedside instruction?*
- **Recent Study (Artino et al., 2018):**
 - For surveys using Likert-type rating items...

65%

of surveys had at least one multi-barreled item

17%

of all the items (591 items) across all the surveys were multi-barreled

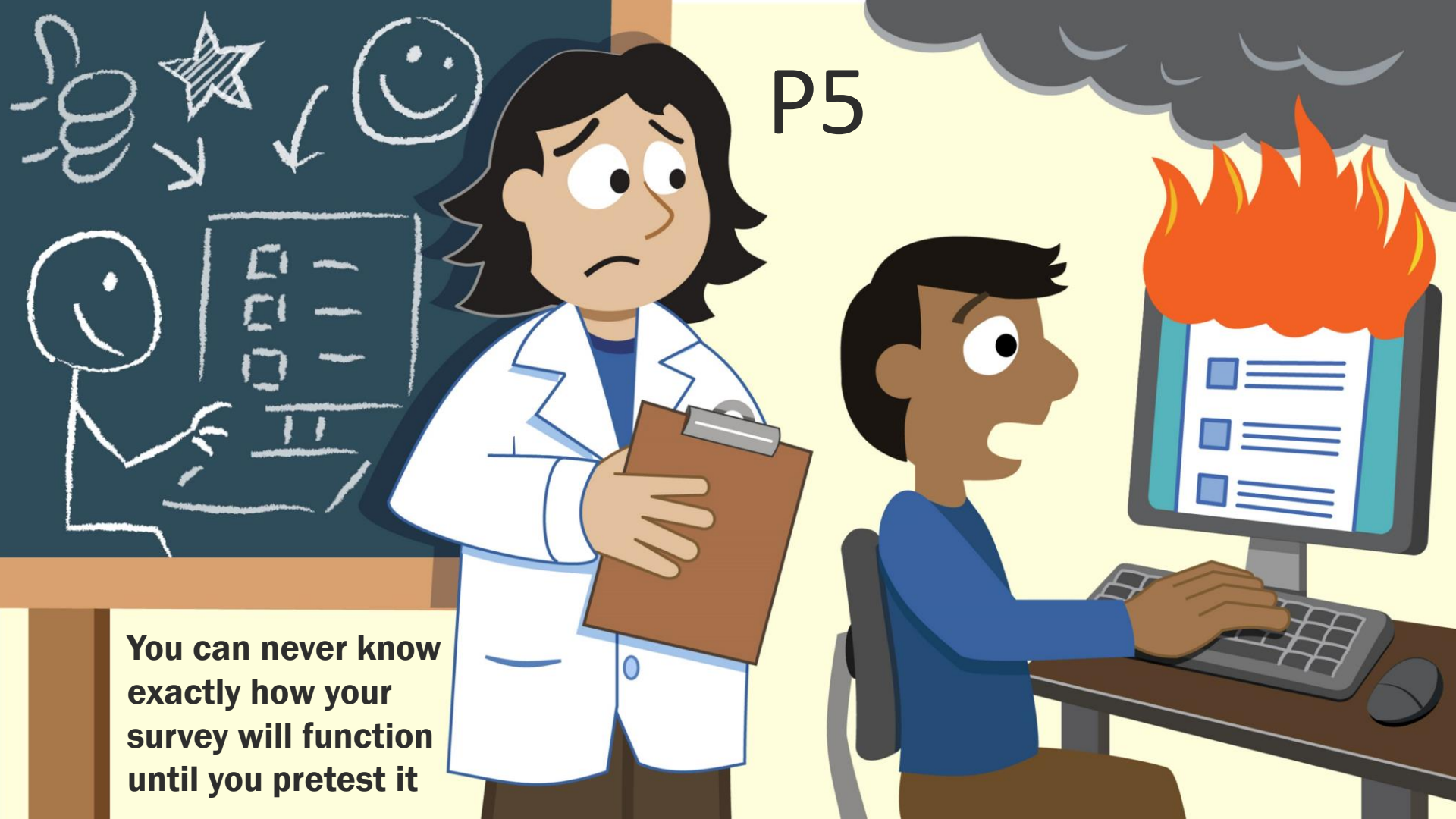
Item #2

NEGATIVELY WORDED ITEMS

Best Practice: Use positive language (i.e., avoid un-, in-, anti-, not, etc.) to ease cognitive processing

- **Example Item:** *In an average week, how often are you unable to start rounds on time? (rarely-often)*
- **Unnecessary cognitive burden; promotes satisficing**
- **Solution:** make sure “yes” means “yes” and “no” means “no”
 - *In an average week, how often do you start rounds on time?*

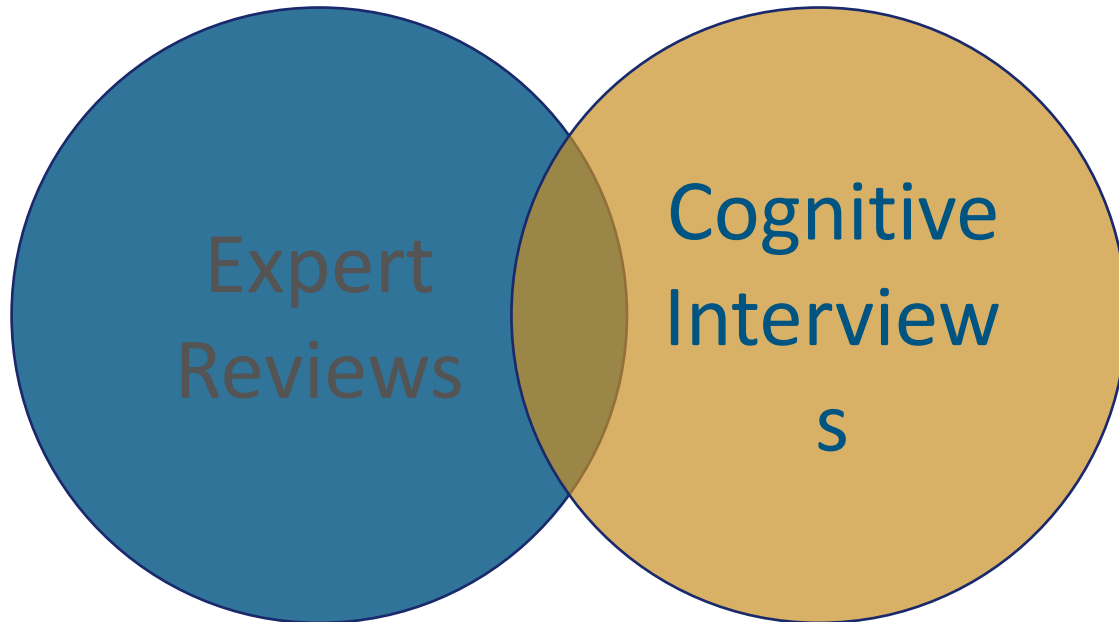
P5



You can never know exactly how your survey will function until you pretest it

Principle #5

YOU CAN NEVER KNOW EXACTLY HOW YOUR SURVEY WILL FUNCTION UNTIL YOU PRETEST IT



Expert Reviews

GOAL: MAKE SURE THE ITEMS “RING TRUE” TO EXPERTS

- **Depending on your needs, experts can consider the following for each of your survey items...**
 - Clarity
 - Construct relevance
 - Language level
 - Missing facets/aspects

Example feedback:

- “I’m not sure that the typical respondent will know what this means—perhaps give an example in parentheses?”

Importance of Expert Review...



Google

Translate

English Welsh Dutch Detect language ▾

Nid wyf yn y swyddfa ar hyn o bryd. Anfonwch unrhyw waith i'w gyfieithu. ✕

🔊 🗣️ ▾

Turn off instant translation

English Spanish Arabic ▾

Translate

I am not in the office at the moment. Send any work to be translated.

☆ 📄 🔊 ↶

✎ Suggest an edit

Cognitive Interviewing

GOAL: MAKE SURE RESPONDENTS UNDERSTAND THE ITEMS AS YOU (THE DESIGNER) INTENDED

- **Recruit members of the targeted population**
 - e.g., students, teachers, patients, locals, etc.
- **Conduct one-on-one interviews, in a “laboratory” or other location**

THEN: Make informed decisions, with cognitive interview as one source of input

Cognitive Interviewing

EXAMPLE 1

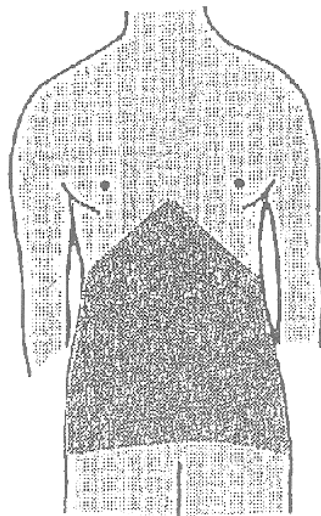
In the last year, have you been bothered by pain in the abdomen?

- **What problems do you anticipate with this survey item?**
 - What time period are you thinking about? (*semantic* comprehension)
 - What does “bothered by pain” mean to you? (*semantic* comprehension)
 - Where is your “abdomen” anyway? (*lexical* comprehension)

Cognitive Interviewing

EXAMPLE 1

Please look at this diagram. During the past 12 months, have you had pain in this area (the area shaded on the diagram)?



Cognitive Interviewing

EXAMPLE 2

Inside your home, are there any walls that have peeling paint?

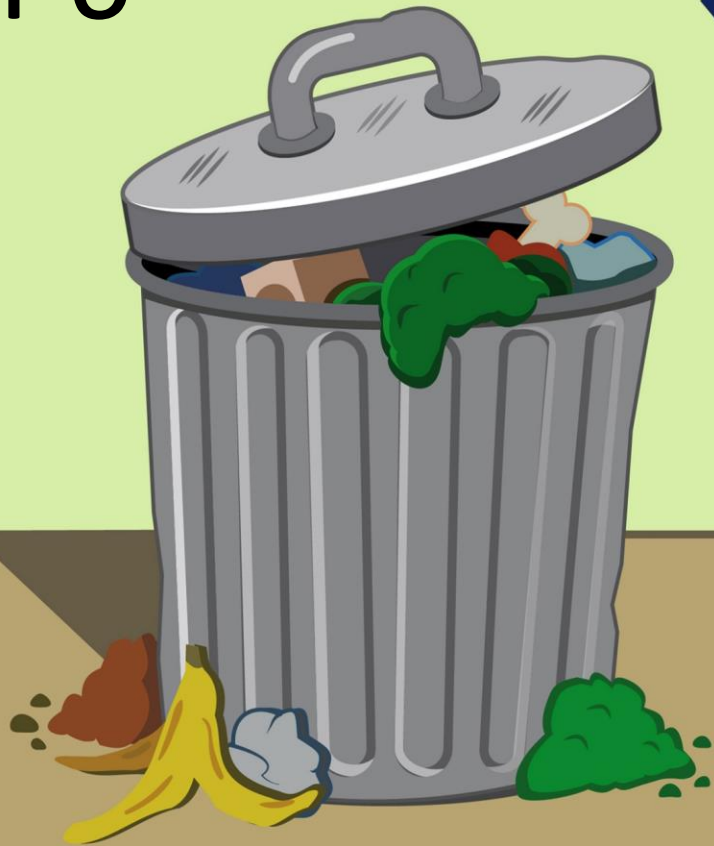
- Subj: *“No... not on the walls, anyway...”*
- Inter (Probe): *“Is there any paint that’s peeling?”*
- Subj: *“Yeah, the window frame...”*

- Problem wasn’t anticipated beforehand – so neither was the probe

Design Guideline

Always PRETEST your surveys!!!

P6



**Good
decisions
cannot be
made from
bad surveys**



Principle #6

GOOD DECISIONS CANNOT BE MADE FROM BAD SURVEYS

Should we go watch the Toronto
Maple Leafs in the Stanley
Cup playoffs?

- Yes
- Yes please
- I'm not sure, what do you want to do?



Want to Improve Your Surveys?

Follow a Systematic Design Process

Step 1: Review Literature

**Step 2: Conduct Interviews and/or
Focus Groups**

Step 3: Synthesize

Step 4: Develop Items

Step 5: Conduct Expert Reviews

**Step 6: Conduct Cognitive
Interviews**

Step 7: Pilot Test



Also for free here: <http://www.tandfonline.com/doi/full/10.3109/0142159X.2014.889814>

Developing questionnaires for educational research

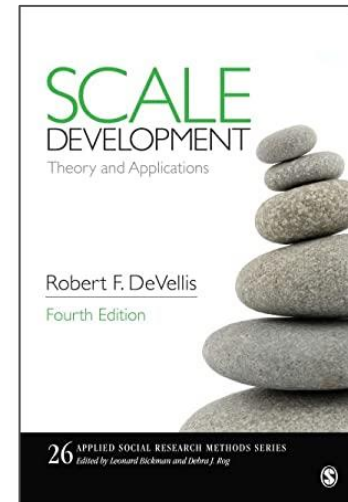
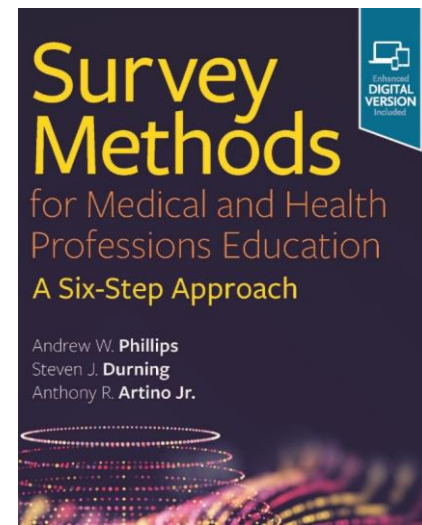
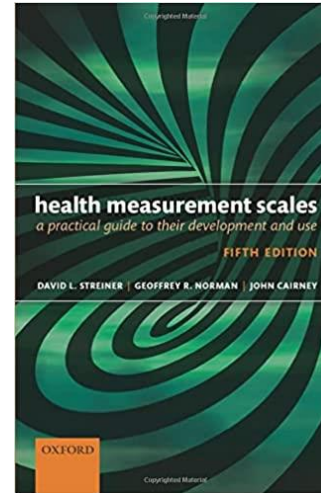
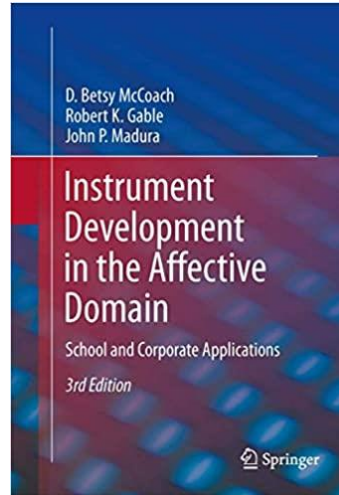
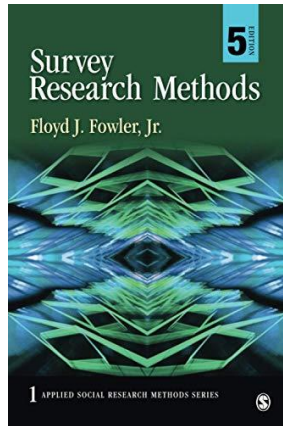
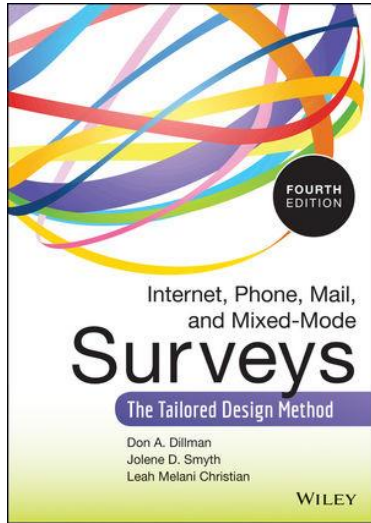
Anthony R. Artino, Jr.
Jeffrey S. La Rochelle
Kent J. DeZee
Hunter Gehlbach

AMEE GUIDE

Research in medical education

87

Want to Improve Your Surveys? *Follow a Systematic Design Process*



The worst survey item ever written...

- *Are there any parts of this experience you don't remember?*

- *If so, which parts?*

Or maybe THIS is the worst survey item ever written?



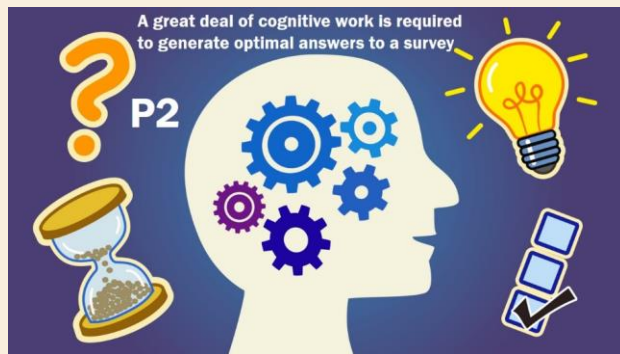
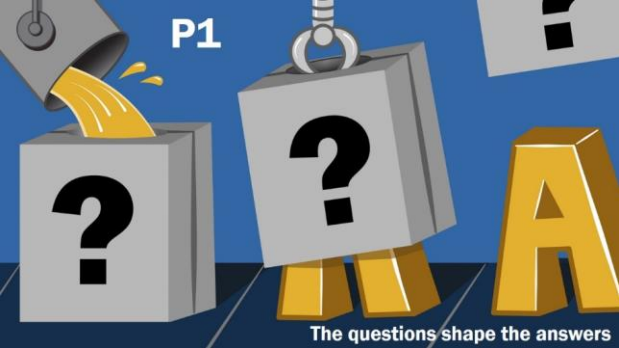
The image shows a screenshot of a web form titled "Online Death Certificate Request". At the top left is the seal of the State of South Carolina. At the top right is a small map of South Carolina with a red dot indicating a location, and the text "Fredrick Smith, Regist". Below the title is the instruction "Step 1: Who is on the Death Certificate?". The main question is "The person listed on the Death Certificate is:". There are two buttons: "Myself" and "Someone Else" with a downward arrow indicating a dropdown menu.

 Fredrick Smith, Regist

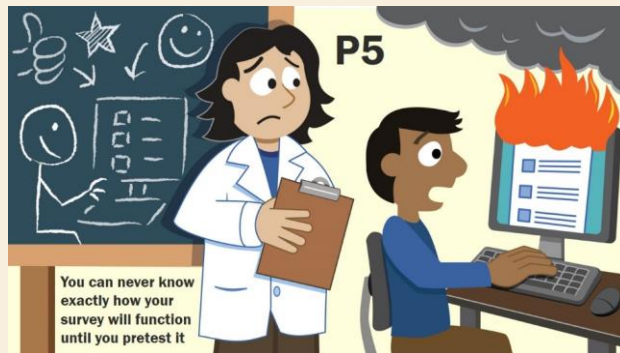
Online Death Certificate Request

Step 1: Who is on the Death Certificate?

The person listed on the Death Certificate is:



If you remember nothing else, remember...



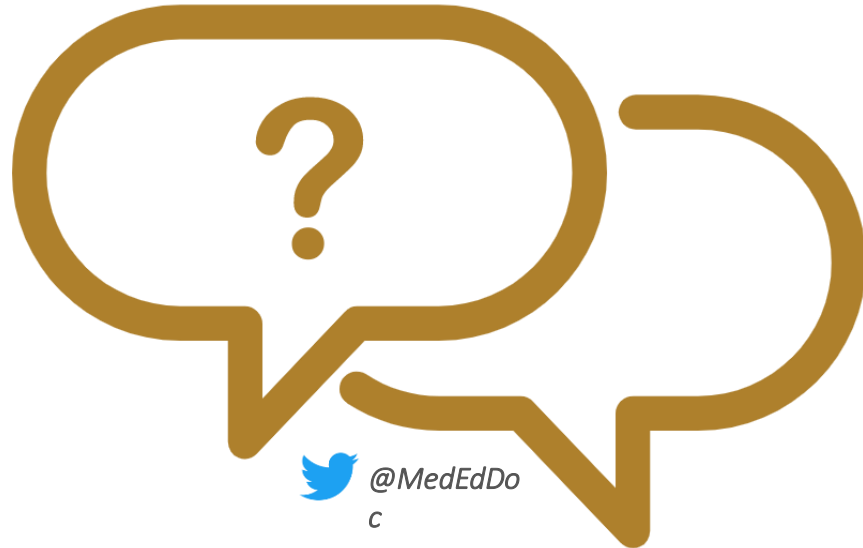
Somewhat
Satisfied



Very
Satisfied



aartino@email.gwu.edu



 [@MedEdDo](https://twitter.com/MedEdDo)
c