Survey Methodology and Design Overview

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Training and Education During Lab Shutdown Series
Learner Outcomes

By the end of this presentation, learners will be able to:

- Understand the survey development process
- Think critically about question stem design, response design, and visual design
- Implement some design tenets in REDCap
Why do we need good surveys?

- To obtain truthful, accurate and useful data
- Survey fatigue is real!
- Combatting nonresponse - making surveys easy-to-answer
- Question wording can dramatically impact responses
- Surveys and self-reports are inherently imperfect – so we need to do the best we can on our end

Survey Development - A Model to Follow

1. Planning and predrafting
   a. Determining and articulating survey purpose
   b. Understanding what surveys can measure
   c. Understanding survey respondents

2. Developing questions
   a. Sourcing questions
   b. Crafting question stems and response options

3. Finalizing
   a. Pretesting
   b. Preparing for administration, analysis and use

Survey Development - A Model to Follow

Keep in mind

• There’s no one “right” way to develop an instrument
• The process is iterative
• It won’t be “perfect” - do your best!
Survey Development - Planning And Predrafting

- Survey development starts at project planning stage
- We tend to think at the question-development and question-editing stage
  - This is often where we can be most helpful as REDCap Admins
  - But often this is too late!
Survey Development - Planning And Predrafting

- Analysis plan should be in place BEFORE completing instrument development.
  - NIH moving toward requiring analysis plans
- The goal is **not** to collect everything possible and decide later what you want to use!
- Goal is to collect what you need
  - This will also limit response burden on participants and get you better quality data
Survey Development - Planning And Predrafting

Have you asked yourself:
  • Is a survey the right tool for my type of data collection?
  • Have I considered key informant interviews? Focus groups?
  • If a survey is the right tool – is there an existing tool I can use?
Survey Development - Planning And Predrafting

Places to find instruments and questions:

- REDCap shared library

- Literature review for instruments previously used (will need to ask permission to use)

- Fellow researchers at CHOP
Survey Development - Planning And Predrafting

Constructs and indicators

- **constructs** are things to be measured that cannot be directly observed
- **indicators** tell us the state or level of something, and they are how we measure constructs

  - construct satisfaction
  - indicator they liked the training, they found the materials helpful or useful, they would recommend, etc.

Response Process

- Processes are sequential although R can backtrack
- Models ideal performance, but Rs:
  - may misunderstand question
  - may not record (“encode”) relevant events in memory
  - may forget relevant events
  - may take shortcuts: satisficing, acquiescence
  - may intentionally misreport: social desirability

Next slide shows a real-life example of response process
OK a drink containing alcohol – a beer, wine, or a cocktail  **COMPREHENSION**

I used to drink a few times a week, but in the past few months it's been more like once a week. Usually I'll have more than one drink at that one sitting.  **RETRIEVAL**

Does that still count as “having a drink containing alcohol” if it's more than one?  **BACK TO COMPREHENSION**

OK, I'll count having two drinks as “having a drink containing alcohol”. So let’s say I do that once a week. Once a week has got to be on this list of choices…..  **RESPONSE**

OK it’s not. Well my answer definitely isn’t “monthly or less” or “4 or more times a week”….how about 2-4 times a month? That’s not really accurate either, though.  **JUDGMENT**

But 2-3 times a week is the second highest one! That seems bad, it makes it seem like I drink a lot. I don’t, so there’s no way I’m in the SECOND HIGHEST CATEGORY! That’s obviously not what they mean by that choice. Why isn’t there a once a week option?  **JUDGMENT**

OK I’ll pick 2 to 4 times a month - that seems closest to right  **RESPONSE**
OK, so you thought about all that stuff - and now you do need to create some questions!
1. **Planning and predrafting**
   a. Determining and articulating survey purpose
   b. Understanding what surveys can measure
   c. Understanding survey respondents

2. **Developing questions**
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*We are here!*
Measurement Error

• Bias
  • Respondents misreport in the same direction

• Variance
  • Respondents are all over the map when answering questions
  • Issue with clarity of question
The question stem refers to the question itself – what we would refer to as the Field Label in REDCap.
Question Stem Design

• A survey question should be worded so that every respondent is answering the same question.

• Words should be chosen so that all respondents understand their meaning.

• If words must be used that have meanings that are unlikely to be shared by all respondents, **definitions should be provided**
  • This may not mean just for “difficult” words, but for common words to ensure everyone is thinking of the same thing.
Question Stem Design

Options for providing definitions
1. Define in the question

3) Infant-only seats are rear-facing, portable seats that come with a handle. They are often installed into vehicles with a base and can be compatible with strollers.

Does your child use an infant-only seat?
Question Stem Design

Options for providing definitions

2. Inline Descriptive Pop-Ups External Module
Question Stem Design - Things to Avoid

Ambiguous wording

• Instead of: How many years have you been employed in your current job?
• Define what you’re interested in: We want to know only about your current position or job title. How many years have you been employed in your current position?
Question Stem Design - Things to Avoid

Numerous logical operators (connecting words like and, but, or, and if)

- These are taxing for respondents
- Instead of: How many times in the last 6 months have you or any of your family members [including parents, children, and any others living in your home or staying with you] visited a health care or other medical facility?
- Define the terms first: Family members include parents, children, and any others living in your home or staying with you. Medical facility includes any place you visit to receive health care. How many times in the last 6 months have you or any family members visited a medical facility?
- This also helps take care of the ambiguous wording!
Question Stem Design - Things to Avoid

Leading/loaded questions

• Can introduce bias (especially in case of social desirability)
• Often these are easy-to-spot/common sense, but more subtle ones can be difficult
• Instead of:
  Did you vote in the 2016 presidential election?
    • Implies that the correct choice is yes
• There are lots of things you could do to improve!
Question Stem Design - Things to Avoid

• Leading/loaded questions
  • Use forgiving wording and give people several options:
    In talking to people about elections, we often find that a lot of people were not able to vote because they weren’t registered, they were sick, or they just didn’t have time. Which of the following statements best describes you?
    • I did not vote (in the election this November)
    • I thought about voting this time, but didn’t
    • I usually vote, but didn’t this time
    • I am sure I voted

Question Stem Design - Things to Avoid

Double (or triple) barreled questions

- This is asking two different questions in one
- Also could greatly improve answer choices - (more on that later)

How knowledgeable and helpful was the nurse on your recent telehealth visit?
- Excellent
- Good
- Fair
- Poor

Improvements on next slide
**Question Stem Design - Things to Avoid**

Fixing double barreled questions - separate them out:

<table>
<thead>
<tr>
<th>How knowledgeable was the nurse on your recent telehealth visit?</th>
<th>Not at all knowledgeable</th>
<th>Slightly knowledgeable</th>
<th>Moderately knowledgeable</th>
<th>Quite knowledgeable</th>
<th>Extremely knowledgeable</th>
</tr>
</thead>
<tbody>
<tr>
<td>How helpful was the nurse on your most recent telehealth visit?</td>
<td>Not at all helpful</td>
<td>Slightly helpful</td>
<td>Moderately helpful</td>
<td>Quite helpful</td>
<td>Extremely helpful</td>
</tr>
</tbody>
</table>
Response Design

Designing the answer choices is as important as designing the questions.
Response Design

Most important thing:
• Make sure the responses match the question stem!
• We see mismatches frequently in REDCap
Response Design

- It seems easy and organized to pull everything into a simple matrix - but you won’t be getting the best data you can get this way
- It’s best to separate out the questions so they are each answered individually

<table>
<thead>
<tr>
<th>Question</th>
<th>Excellent</th>
<th>Very Good</th>
<th>Fair</th>
<th>Poor</th>
</tr>
</thead>
<tbody>
<tr>
<td>How knowledgable was the nurse on your recent telehealth visit?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>How helpful was the nurse on your recent telehealth visit?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>What was your level of satisfaction with your recent telehealth visit?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Response Design

<table>
<thead>
<tr>
<th>Question</th>
<th>Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>How knowledgeable was the nurse on your recent telehealth visit?</td>
<td>☐ Not at all knowledgeable</td>
</tr>
<tr>
<td></td>
<td>☐ Slightly knowledgeable</td>
</tr>
<tr>
<td></td>
<td>☐ Moderately knowledgeable</td>
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<tr>
<td></td>
<td>☐ Extremely helpful</td>
</tr>
<tr>
<td>What was your level of satisfaction with the telehealth visit?</td>
<td>☐ Very dissatisfied</td>
</tr>
<tr>
<td></td>
<td>☐ Somewhat dissatisfied</td>
</tr>
<tr>
<td></td>
<td>☐ Neither satisfied nor dissatisfied</td>
</tr>
<tr>
<td></td>
<td>☐ Somewhat satisfied</td>
</tr>
<tr>
<td></td>
<td>☐ Very satisfied</td>
</tr>
</tbody>
</table>

Questions separated out with matching answer choices
Response Design - Don’ts and Fixes

DON’T: Use agreement-based responses  
(strongly disagree - strongly agree scale)

Agreement-based responses are SUPER popular, so this may come as a surprise!  
Some of the issues with agreement scales:

- They don’t emphasize the construct being measured  
- Prone to acquiescence  
- May encourage respondents to think through responses less thoroughly

Response Design - Don’ts and Fixes

What to do instead of agreement-based scales:
● Use construct-specific response anchors

I am worried that I or someone in my family will get sick from coronavirus.
○ Strongly agree
○ Agree
○ Neither agree nor disagree
○ Disagree
○ Strongly disagree

How worried, if at all, are you that you or someone in your family will get sick from coronavirus?
○ Very worried
○ Somewhat worried
○ Not too worried
○ Not worried at all

Agreement-based, unspecific
Response Design - Don’ts and Fixes

Including Don’t Know as an option: current research says not to include

Krosnick’s Verdict
(Krosnick and Presser, 2010; Kronick, 2012)

1. DKs are mostly not due to complete lack of information.
2. DKs are mostly due to ambivalence, unclear questions, intimidation, self-image protection, and satisficing.
3. The best questionnaire design strategy appears to be omitting DK filters and telling respondents: “I’ll note that, but if you had to choose, would you say…”
4. The result will be collecting informative data from a larger proportion of your sample.
Make sure your responses are **exhaustive** and **mutually exclusive**

- **Exhaustive** – Cover the full range of expected answers
- **Mutually exclusive** – Do not overlap

**Not exhaustive**

**Exhaustive - covers all options**
Response Design

Think about your frequency scales

• Research has shown that respondents presented with “medium frequency” response options reported “significantly fewer target events than those presented with high frequency options”

• What does this mean in reality?

Response Design

Think about your frequency scales

- **Low-frequency response options:** respondents are more likely to interpret sadness as a major event (loss of a loved one, etc.)

- **Medium-frequency response options:** respondents are more likely to interpret sadness as a minor event (watching a sad movie)
Visual Design

How your questions and responses are presented visually can affect the answers you get
Visual Design

DON’T: Label only endpoints of response options

Leaves the unlabeled responses open for interpretation ✗

Increases likelihood of similar interpretation 😊
Visual Design

DON’T: Unequally space response options

Confusing and unequal spacing

Much easier to read, and all options get equal space 😊
Visual Design

Strange order and spacing with horizontal alignment

Vertical alignment is generally better 😊
Visual Design

You can change alignment using the Custom Alignment dropdown in the Online Designer.
Visual Design

Matrix choices can space unevenly

Sometimes rotating matrix response choices can help
Visual Design

Code to rotate matrix response choice text:

```html
<div style="transform: rotate(-90deg); -webkit-transform: rotate(-90deg); -moz-transform:rotate(-90deg); -ms-transform:rotate(-90deg); white-space: nowrap; position: relative; top: -40px; left: -7px; margin-top: 50px;">Response Here</div>
```

Play with the degrees and the margins to get what you want
Visual Design

Can also insert line breaks in matrix responses

<table>
<thead>
<tr>
<th>Matrix Column Choices</th>
</tr>
</thead>
<tbody>
<tr>
<td>Choices (one choice per line)</td>
</tr>
<tr>
<td>1, Less than 30 minutes</td>
</tr>
<tr>
<td>2, More than 30 minutes but less than 1 hour</td>
</tr>
<tr>
<td>3, More than 1 hour but less than 2 hours</td>
</tr>
<tr>
<td>4, More than 2 hours</td>
</tr>
</tbody>
</table>

How do I manually code the choices?
Visual Design

DON’T: Place nonsubstantive response options together with substantive response options

How many weekdays (Monday through Friday) during a typical week do you ride your bicycle to work?

- 1 day
- 2 or 3 days
- 4 or 5 days
- not applicable

Improvement on next slide
Visual Design

Add a double line break in your choices using HTML

28) How many weekdays (Monday through Friday) during a typical week do you ride your bicycle to work?

- 1 day
- 2 or 3 days
- all 5 days
- not applicable

Choices (one choice per line)

1, 1 day
2, 2 or 3 days
3, all 5 days <br> <br>
6, not applicable

Copy existing choices

How do I manually code the choices?
Visual Design

However - line break method doesn’t work with enhanced boxes

You may have to use your best judgement if administering surveys on phones
Next Steps

• Let me know any specific questions you have! I may not know now but I can research for you!

• If you’re working on a survey currently, we can do a design consult

• Contact me at
  • berriganl@email.chop.edu
  • redcap@email.chop.edu → reaches entire REDCap team