

Designing Effective Surveys

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Session Outcomes

At the end of this session, you will be able to:

- Construct effective survey invitation letters to optimize response rates
- Recognize effective strategies for reducing participants' cognitive load
- Recognize effective strategies for mitigating various sources of error
- Construct high-quality survey items
- Identify common item construction flaws
- Differentiate various types of rating scales
- Evaluate the quality of existing surveys
- Appreciate both the art and science of survey research

Overview of Session

- We will cover best practices of survey research.
- We will focus specifically on:
 - Understanding critical elements of an invitation letter
 - Tips and tricks to reduce fatigue on survey respondents
 - Understanding common flaws among survey items
 - Understanding what rating scales are available, and most appropriate
- Throughout the session you will be calibrated to be sensitive to item construction flaws. Collectively, we will critique an instrument and identify as many flaws as we can.
- Leave some time at end for you to evaluate your instrument(s) with your calibrated eyes.

The Anatomy of a Survey

A good invitation letter is critical.

It's a good idea to...

- Introduce yourself
- Describe purpose of the survey
 - Ethically you must disclose enough information to give participants some sense of whether or not they will want to participate.
 - However, you shouldn't give too much away because doing so could influence both *who responds* and *how they respond*.

Invitation Letter

- Clarify if confidential or anonymous
 - Anonymous means no one (including you) knows who said what
 - Confidential means it is possible to know who said what, but you promise not to connect anyone to any responses or disclose who said what
- Any eligibility criteria?
- Any incentives?
- How long will it take to complete the survey?
- Give a due date for completion
- If paper-and-pencil, give instructions for returning the survey
- Don't say things like "Please be honest" or "Please be as honest as possible"
- Be professional and as personable as possible

Invitation Letter (cont.)

- If part of a research project, certain ethical components are also necessary. These include:
 - Voluntary nature
 - Free to withdraw at any time
 - No repercussions of any kind
 - Participation is an indication of consent (waiver of informed consent)
 - Present any known risks
 - Contact information for you
 - Contact information for IRB director at NCSU

Example of a Generic Cover Letter

Other Considerations

- Survey medium: Paper-and-pencil, electronic, telephone?
- Access issues might affect the quality of the sample frame
 - Some people may have less access to electronic surveys
 - Some people may not be able to read well
 - Depending on the subject, some demographic groups may be reluctant to respond
- Know your audience and design your survey to have a conversational tone with them

Common Questions

- “How many reminders should I send?”
- “How many days should I wait before sending a reminder?”
- “Is there a particular day of the week that is best for administering the survey?”
- “Is there a particular time of day that is best for sending out the survey?”

- “What is the minimum response rate that is acceptable?”
- “How many participants do I need?”

Table 1. Relationship between Sample Size and Margin of Error (with 95% confidence level).

Population Size	5% MOE	3.5% MOE	3% MOE	1% MOE
10	10	10	10	10
20	20	20	20	20
30	28	29	30	30
40	37	39	39	40
50	45	48	48	50
100	80	89	92	99
150	109	127	132	148
200	132	160	169	196
250	152	190	203	244
500	218	306	341	476
1,000	278	440	517	906
5,000	357	678	880	3,289
10,000	370	728	965	4,900
25,000	379	761	1,024	6,939
50,000	382	772	1,045	8,057
100,000	383	778	1,056	8,763
250,000	384	782	1,063	9,249
500,000	384	783	1,065	9,423
1,000,000	384	784	1,066	9,513
2,500,000	385	784	1,067	9,567
10,000,000	385	784	1,067	9,595
100,000,000	385	784	1,068	9,603
300,000,000	385	784	1,068	9,604

The Psychology of Survey Construction

Empathize with Participants

- Be considerate of the burden the survey might place on participants
 - This can include considerations about topics, number of items, amount of detail, etc.
 - Consider the “cognitive load” required of participants
- Distinguish between what is necessary vs. what is simply good to know
- Focus on asking the questions necessary to answer your question(s)

Navigation and Order

- Begin questionnaire with most important items (minimize losses due to participant attrition).
- Make use of sections and sign-posting (makes surveys less cumbersome for participants)
- Avoid jumping around from topic to topic (keeps participant focused and more likely to answer more questions)
- Present items one at a time in vertical manner; multiple items per line are likely to result in participants miss/overlook an item

How old are you? _____ What is your gender? Male 1 Female 2

- Contingency/Branching Questions (can help reduce size of survey, avoid frustrating participants with extraneous items, etc.)

4. Do you have children under 18 at home?

No → please skip to question 15

Yes → please go on to question 5

5. How old is your youngest child?

6. What child care arrangements do you use while at work? (Check all that apply).....

7.....

Open-Ended Items

- Use sparingly

What improvement would you like to see in our services ?

Other Considerations

- Random vs. Non-random Item Ordering

More Endorse Working Together When Asked Second

Asked first	<i>Should Rep. leaders...</i>	%	<i>Should Dem. leaders...</i>	%
	Work with Obama	66	Work with Rep. leaders	82
	Stand up to Obama	28	Stand up to Rep. leaders	13
	Don't know	<u>6</u>	Don't know	<u>5</u>
		100		100
Asked second	<i>Should Dem. leaders...</i>		<i>Should Rep. leaders...</i>	
	Work with Rep. leaders	71	Work with Obama	81
	Stand up to Rep. leaders	21	Stand up to Obama	15
	Don't know	<u>8</u>	Don't know	<u>4</u>
		100		100
N		744		756

Other Considerations

- Be consistent with item types and formats
 - Don't ask respondents to circle some answers, place check marks next to others, or an "X" within a circle for others
- Know when to use radio buttons, check boxes (for Check all that apply items), and drop-down menus to minimize appearance of "work"

I find it painful to change my routine

When faced with a task I don't like I tend to procrastinate

Changes in my life give me significant discomfort

I find it difficult to make decisions when the environment is in chaos

New situations make me feel anxious

Question type: "CHECK ALL THAT APPLY"

Please check those statements that are true for you:

- I need to conduct a survey
- I've never designed a survey before
- I have experience at designing surveys
- I am just researching survey software for now
- I want to survey my customers
- I will need email lists to survey
- I'd like help designing my survey
- I prefer to design a survey on my own

What is your country of citizenship?

United States

United States

US Minor Outlying Islands

Uruguay

Uzbekistan

Vanuatu

Vatican City State

Venezuela

Viet Nam

Virgin Islands (British)

Virgin Islands (U.S.)

Wallis/Futuna Islands

More Common Questions

- “What is the maximum number of items I should include?”
- “Should I group related items together?”
- “Should demographic items go at the beginning or the end of the survey?”
- “How many demographic items should I include?”
- “How many items should I put on each page?”
- “How many pages should I limit the survey to?”

Item Construction Guidelines

Item Construction Guidelines

- General vs Personal Wording
 - “Merit raises should be awarded to all CVM personnel”
 - “I feel that merit raises should be awarded to all CVM personnel”
- Collective groups
 - A common mistake is wording questions about collective groups as if they hold a unified opinion.
 - “My family supports my decision to become a veterinarian”

- Ambiguous Items
 - Questions should be specific, avoiding generalities.
 - "On a scale from 1 to 10, how popular is 'The Walking Dead' at this time?"



drgrayfang



Latest Walking Dead episode shocks the 4 people that still watch

Posted on March 18, 2019, 01:40 EDT



Liked by girlstthinkimfunny and 59,636 others

drgrayfang Follow @toptree for dank memes

[View all 1,283 comments](#)

drgrayfang Just end this shit already



Item Construction Guidelines (cont.)

- Avoid Negative Statements
 - It's difficult for people to know what they're agreeing with
 - “It is not good to stay up late studying before an exam”
 - Avoid double negatives too

How do you feel about the following statement?
We **should not reduce** investment in sexual health services.

<i>Strongly Agree</i>	<i>Agree</i>
<i>Disagree</i>	<i>Strongly Disagree</i>

Item Construction Guidelines (cont.)

- Direction of statements
 - It's a good idea to mix these so not all answers lead to “agree” or “disagree” (increases variation; improves reliability measures, etc.)
 - Word questions so that participants must agree with some and disagree with some others.
 - “Getting a good night’s rest before an exam is helpful”
 - “Staying up late studying the night before an exam helps a lot”
 - Both are worded without negatives but capture two different viewpoints. A respondent could not really agree with both of these items.

Item Construction Guidelines (cont.)

- Always and Never
 - “Always avoid the use of the word ‘always’, and never use the word ‘never’.”
 - Very few people always do something or never feel a certain way about a statement. A better way to word statements are “almost always” or “almost never”.

Item Construction Guidelines (cont.)

- Double-barreled items
 - This occurs when an item measures two things at the same time.
 - Usually, these items contain the word “and”.
 - “Do you like burgers and fries?”

Did you find the classes you took during your first semester of college to be more demanding and interesting than your high school classes?

Yes

No

Item Construction Guidelines (cont.)

- Leading Question – A question that leads respondents in a particular direction and suggests that they should agree with you.
 - “Do you agree that grades should be abolished in our college?”
- Loaded question – A question in which you push in a particular direction by weighing it down with specifically charged or biased words.
 - Invoking authorities or majorities is one common technique to gain agreement.
 - “Most doctors feel 7-9 hours of sleep per night is healthy. How strongly do you agree or disagree that we should be getting 7-9 hours sleep each night?”

Item Construction Guidelines (cont.)

- Language
 - The wording of items should reflect the education level and reading language abilities of those filling it out
 - Keep in mind that English may not be the first language for some respondents
 - Avoid jargon, acronyms, technical terms, and obscure phrases
 - “How effective is ESS at meeting your needs?”
 - “Do you own a ruminant animal?”
 - “Does the CVM website obfuscate information for students?”

Item Construction Guidelines (cont.)

- Ranking
 - Sometimes it is useful to ask people to rank order a set of items. However, be aware that asking people to rank more than 5 to 10 things can be a difficult task.
 - Further, ranking only tells you that someone prefers something more or less than something else... it doesn't describe intensity.

- Knowledge questions
 - If you want to know how much respondents know about something, it might be a good idea to use filter questions.

Do you love or hate Marmite?

Love

Hate

What is Marmite?

Item Construction Guidelines (cont.)

- Knowledge questions (cont.)
 - Don't expect accurate answers when you test people about what others do or feel (unless that's the goal of your survey).
 - “How many of your co-workers drink beer weekly?”

Item Construction Guidelines (cont.)

- Measuring behavior
 - Knowing how people feel about something is usually not enough.
 - We might also want to know if these opinions translate into action and whether people actually act upon what they feel.
 - In many cases, finding out what people do tells you as much about their values and beliefs as asking them to report their opinions.

Item Construction Guidelines (cont.)

- Mutually Exclusive
 - Mutually exclusive means it is not possible for a respondent to select more than one category or value as an answer to a question.
 - “How many times in the past week did you go to the library?”
 - 1 = daily
 - 2 = 1-2 times
 - 3 = 4-7 times
 - 4 = never
 - Both “daily” and “4-7 times” could be selected if someone went every day that week, so the options are not mutually exclusive.

Item Construction Guidelines (cont.)

- Exhaustive
 - Items are exhaustive when all possible values or categories are provided as responses to the item.
 - “How many times in the past week did you go to the library?”
 - 1 = daily
 - 2 = 1-2 times
 - 3 = 4-7 times
 - 4 = never
 - If students went to the library 3 times, which option would they choose? The options aren't exhaustive because it left that response option out.

Item Construction Guidelines (cont.)

- Forced-choice
 - “Do you like pop or rap music?” (From 23andMe)
 - There’s a lot you leave out by forcing a choice.
 - This item is not exhaustive of other genres of music (What if I like hard rock, heavy metal, country, and/or other genres?)
 - Item says nothing about how intensely someone might like pop or rap music
 - Item says nothing about how often the respondents listen to pop or rap music
 - Some respondents may not like either choice, but are forced to choose the lesser of two evils.

Item Construction Guidelines (cont.)

- Recalling behavior
 - Some behavior is not easy to remember, so it is important to ask questions that respondents can actually answer
 - “How many times in the past month have you used a credit card?”
 - “How many times in the past month have you eaten a salad?”
 - Unless you pay only with cash or check, never ate salads, or indulged everyday, it’s not likely that you can recall details about ordinary events
 - Ask yourself what is a reasonable time frame to ask someone if they have done something

Item Construction Guidelines (cont.)

- Requiring inaccessible information
 - An item may use familiar terms but require information most respondents would not know
 - “Is your family income above, about equal to, or below the official poverty rate for a family of four?”
 - This question is problematic because people are not likely to know what dollar amount constitutes the poverty line

Item Construction Guidelines (cont.)

- Multidimensionality
 - Multidimensional items capture multiple facets of something and make it difficult to parse out meaning
 - “Do you approve or disapprove of the President’s performance?”
 - A respondent may be torn between multiple dimensions of performance, such as domestic v. foreign policy, health care reform, the economy, immigration, etc.
 - Unless you are really truly interested in a holistic answer, avoid these types of questions.

Item Construction Guidelines (cont.)

- Honesty checks
 - As with attitudes, some respondents are prone to exaggerating the truth or giving socially desirable answers about what they do or how they act in particular situations.
 - If you want to build in a “trap” consider including unlikely choices among the close-ended items.

During the past year, which of these books have you read? (Circle all that apply.)

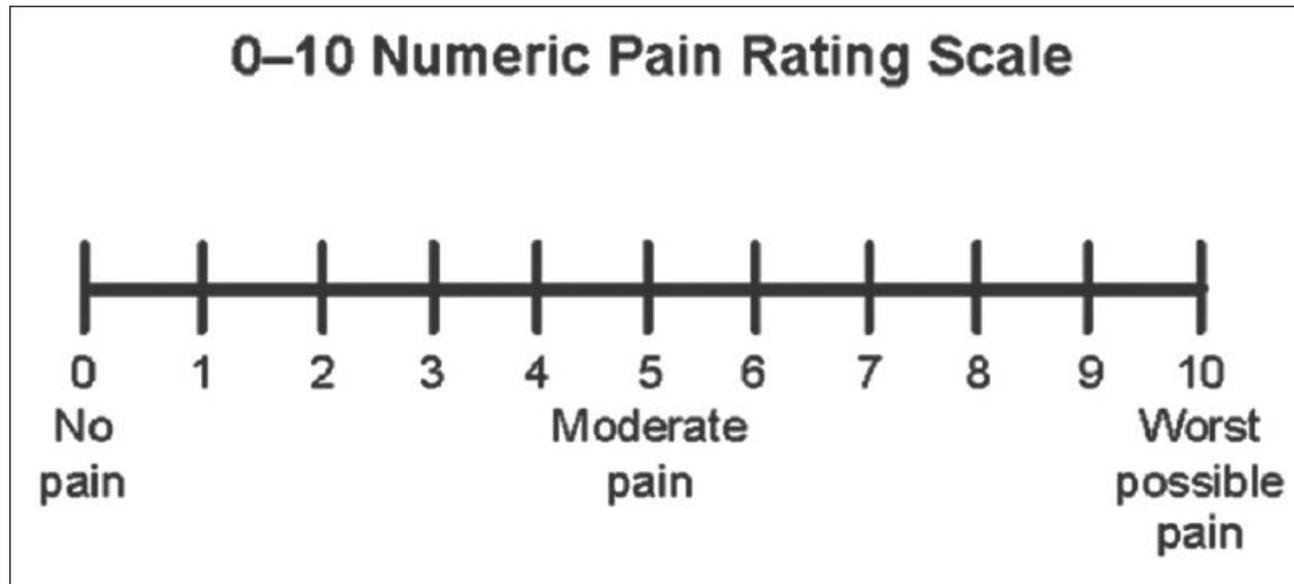
1. *A Clockwork Orange*
2. *Black Beauty*
3. *The Scarlet Sweater*
4. *The Color Purple*

Rating Scales

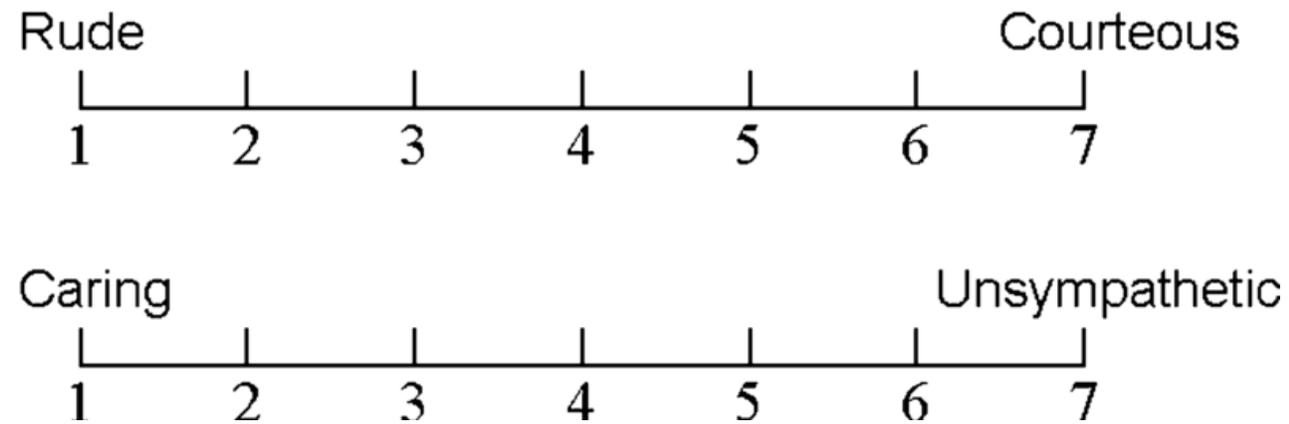
Rating Scales

- Common rating scales include:
 - Likert Scale
 - Strongly Disagree, Disagree, Neutral, Agree, Strongly Agree
 - Likert-type Scales
 - Very Satisfied, Satisfied, Neutral, Dissatisfied, Very Unsatisfied
 - Frequency Scales
 - Never, Sometimes, Usually, Almost Always
 - Qualitative Scales
 - Poor, Fair, Good, Excellent

– Visual Analog Scale



– Semantic Differential Scale



– Fixed Sum Scale

How many hours of your day are spent participating in the following activities?

Using Qualtrics' products

5

Walking the dog

1

Relaxing while Qualtrics gathers data for you

18

Worrying about your next project

0

Total

24

>>

– Ranking item

Please rank the following factors in order of importance to you in your work, where 1 is most important and 5 is least important:

	1	2	3	4	5
Pay	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Benefits	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Recognition	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Career opportunities	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Supportive colleagues	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

– Paired comparison

Please select the component which is most important to you

Speed of Service

Ease of Parking

Please select the component which is most important to you

Speed of Service

Cleanliness

Please select the component which is most important to you

Speed of Service

Friendliness of Staff

Please select the component which is most important to you

Cleanliness

Ease of Parking

Please select the component which is most important to you

Friendliness of Staff

Ease of Parking

Please select the component which is most important to you

Friendliness of Staff

Cleanliness

Other Considerations

- “How many rating scale categories should I include?”
- “Should scales be even or odd numbered?”
- “Should I include a ‘neutral’ category?”
- Be careful with rating scale options that might confuse participants
 - Almost never
 - Rarely
 - Sometimes
 - Often
 - Almost always

Other Considerations

- Make sure your items correspond with what you are asking
 - Pain scales are notoriously terrible at this

Choose an option to describe your pain:

 <input type="radio"/>	 <input type="radio"/>	 <input type="radio"/>	 <input type="radio"/>	 <input type="radio"/>
Unbearable Pain	Intense Pain	Nagging Pain	Mild, Annoying Pain	No Pain



0: Hi. I am not experiencing any pain at all. I don't know why I'm even here.

1: I am completely unsure whether I am experiencing pain or itching or maybe I just have a bad taste in my mouth.

2: I probably just need a Band Aid.

3: This is distressing. I don't want this to be happening to me at all.

4: My pain is not fucking around.

5: Why is this happening to me??

6: Ow. Okay, my pain is super legit now.

7: I see Jesus coming for me and I'm scared.

8: I am experiencing a disturbing amount of pain. I might actually be dying. Please help.

9: I am almost definitely dying.

10: I am actively being mauled by a bear.

11: Blood is going to explode out of my face at any moment.

Too Serious For Numbers: You probably have Ebola. It appears that you may also be suffering from Stigmata and/or pinkeye.

Exercise with Sample Survey

Questions?

Please contact me (kdroyal2@ncsu.edu) if you would like assistance with your survey (or other assessment, evaluation, education research project(s)).