SURVEYS (CONTINUED)

Michael Coblenz

WHY SURVEYS?

- Generalize your findings
- Shallower than interviews
  - But scale much better
- Focus in on specific problems to work on

CLARIFY TYPE OF RESPONSE

- How old are you? 
- What is your date of birth?   

Month Day Year

ATTITUDES AND OPINIONS REQUIRE MORE TIME

- In your opinion, how common are null pointer exceptions in Java?
  - Uncommon
  - Somewhat common
  - Very common

MEMORIES OF COMMON EVENTS FADE

- How many null pointer exception bugs have you fixed in the last week? 
- How many null pointer exception bugs have you fixed in the last year? 
- How many times have you ever been fired? 

AVOID ASKING UNANSWERABLE QUESTIONS

- During how many days last week did you eat pasta? 

EARLIER QUESTIONS BIAS LATER RESPONSES

- How serious are null pointer exceptions in Java?
- How serious are null pointer exceptions in SML?
- Which is better, Java or SML?
- Primacy: more frequently choose earliest choices
- Recency: more frequently choose last choices
- Randomize answer order when possible

QUESTION FORMAT

- Self-administered: more likely to skip open-ended questions than closed-ended questions
- Interviewer-administered: open-ended may be easier for participants than closed-ended

GUIDELINES (DILLMAN, SMYTH, CHRISTIAN)

- Appropriate question format
- Make sure question applies
- Ask one question at a time
- Make sure question is accurate
  - "How many feet tall is your horse?"
- Use simple, familiar words
- Complete sentences: "Your city or town:_____" vs. "In what city or town do you live?"

GUIDELINES(2)

- Use as few words as possible
- Make sure yes means yes
  - "Should the city manager not be directly responsible to the mayor?"
- Mutually exclusive options
- Forced choice is better than check-all-that-apply

MOTIVATE PARTICIPANTS

- "In your own words, how would you describe your adviser(s)?"
- "This question is very important to understanding the Washington State University student experience. Please take your time in answering it."
- Increased response length 5-15 words
- Increased response time 20-34 seconds

USING PROBES

- "What businesses would you like to see in the Moscow area that are currently not available?" — average 1.8 answers
- "Are there any others?" — average 2.4 answers
- Not: "How about a Taco Bell?"

BOTTOM LINE

- Pilot!

GROUNDED THEORY

- Goal: find themes and develop theories from qualitative data.
- Do not identify a hypothesis in advance.
- Instead, *observe* and learn.

GROUNDED THEORY

- Observe some phenomenon.
- Record events.
- "code" events. ("open coding")
- Establish relationships ("axial coding")

Research question: What irritates or upsets Millennials when receiving feedback on their work?

Open code	Properties	Examples of participants' words
Getting called out	Detesting verbal vomit and being ridiculed Feeling discouraged	Getting ripped apart Chewed out Bashed Chastised Criticized Thrown under the bus Negative tactics don't motivate us
Not being heard	Having work changed, which results in their voice not being heard Working so hard makes this frustrating Believing they don't have power to say anything	You slave away and they've completely changed what you've done My art was changed, which I worked really hard on People are always going to change what you do. Always! Co-worker presented my ideas as her own; no way to address those issues
Mind reading and expectations for a miracle worker	Believing they have a combination of vague instructions and specific expectations, some of which are unrealistic	Vague instructions Having to mind read Inadequate explanation I'm not a miracle worker

Tiffany Gallicano. https://prpost.wordpress.com/2013/07/22/an-example-of-how-to-perform-open-coding-axial-coding-and-selective-coding/

AXIAL CODING

"Axial coding consists of identifying relationships among the open codes. What are the connections among the codes?"

Open codes	Axial codes	Selective code
Wanting experiential learning; constantly learning; working in a good environment;pioneering social media and easily adapting to change; feeling entitled due to unique qualifications, as compared to previous generations; possessing the personal skills and characteristics needed; being groomed	Believing they are ready to be set loose on accounts	Wanting to make a difference
Craving immediate feedback and being motivated by feeling appreciated; detesting getting called out; receiving verbal encouragement and making observations	Seeking external validation	
Mind reading and expectations for a miracle worker;getting called out; not being heard	Silently blaming employers for failures	
Advocating a work-life balance; being cared for as a whole person; accommodating interests and preferences	Wanting a meaningful experience at work and outside of work	

Credit: Tiffany Gallicano

CONCLUSIONS

- Pilot, pilot, pilot. Revise after each one.
- When in doubt, narrow your research/design question.
- Phrasing your usability question *specifically* is a critical step
- Design tasks that identify the kinds of usability problems you are interested in
- Iterate to design good materials.

QUANTITATIVE STUDIES

BASIC VOCABULARY

- Independent variables: things the experimenter chooses
  - Can assign participants to languages
  - Sometimes "explanatory variables"
- Dependent variables: things the experimenter measures
- Confounding variables: also affect dependent variables

EXAMPLES

- Want to know if red squiggly underlines in IDEs help people finish tasks faster.
  - Independent variable: whether underlines appear
  - Dependent variable: task completion time
  - Confounding variable: color-blindness

DEALING WITH CONFOUNDING VARIABLES

- Two options:
  - Control them
  - Record them

SIMPSON'S PARADOX

	Men		Women	
	Applicants	Admitted	Applicants	Admitted
Total	8442	44%	4321	35%

UC Berkeley, Fall 1973

Conclusion: discrimination against women?

Credit: Wikipedia contributors

ADMISSIONS BIAS?

Department	Men		Women	
	Applicants	Admitted	Applicants	Admitted
A	825	62%	108	82%
B	560	63%	25	68%
C	325	37%	593	34%
D	417	33%	375	35%
E	191	28%	393	24%
F	373	6%	341	7%

Bickel et al.: women tended to apply to competitive departments with low rates of admission even among qualified applicants (such as in the English Department), whereas men tended to apply to less-competitive departments with high rates of admission among the qualified applicants (such as in engineering and chemistry).

Credit: Wikipedia contributors

KIDNEY STONES

	Treatment A	Treatment B
Small stones	Group 1 **93% (81/87)**	Group 2 87% (234/270)
Large stones	Group 3 **73% (192/263)**	Group 4 69% (55/80)
Both	78% (273/350)	**83% (289/350)**

When the less effective treatment (B) is applied more frequently to less severe cases, it can appear to be a more effective treatment.

Credit: Wikipedia contributors

HYPOTHESIS TESTING

- Context: drawing from two populations.
- Question: what is the probability the two populations are the same?
- This is what *p-value* captures.
- See pictures.

EFFECT SIZE

- Small p-value does not imply a large effect!