HCI: QUESTIONAIRES

Dr Kami Vaniea

Questionnaires

Questionnaires

- Ask participants to answer a set of pre-defined questions. Similar to a structured interview but on paper or on a computer
- Pros:
  - gather data from a large number of people quickly
  - can determine how prevalent an issue or concern is
  - close-ended questions are easy to analyze
- Cons:
  - can only gather data you know about
  - careful planning is required before running a questionnaire
  - open-ended questions can take a lot of time to analyze and require careful setup

Questionnaires can be used at various points in the design process

- Requirements gathering
  - Understand the target population
- Testing a theory
  - Are my assumptions correct?
- Testing a prototype design
  - How do people interpret my interface?
- Testing the final design
  - How are people actually using it?
  - What do people think after they use it?

What do you want to know about?

- Attitudes
  - Do you like X?
- Behaviors
  - How often do you use X?
  - Do you regularly do X?
- Conceptualizations
  - Which of the following best describes X?
- Expectations
  - If the webpage did X what would you expect to happen?
- Capabilities
  - What is the result of adding 20 and 30?

Common survey elements

- Single and multiple choice checkboxes
- Matching
  - Rank the following from 1 to 5
- Rating scales
  - Likert Scales
    - 3, 5, 7 points scales
  - Semantic scales
- Open ended responses

Open ended

- Where does this URL go? What does it do?

Easier to write, harder to analyze

Harder to write, easier to analyze

Close-ended

If you clicked on the link above, what web page would open?

○ WWW3's main page
○ National Geographic's main page
○ World News's main page
○ I will be taken to one of the sites above, but not their main page
○ I will be taken to a website not listed above
○ Other _____

Response Anchors

Psychologists have been working for quite some time to determine the least biased way to present a set of answers.

On the right are a set of response anchors that are known to work well.

Likert-Type Scale Response Anchors

Level of Acceptability
- 1 – Totally unacceptable
- 2 – Unacceptable
- 3 – Slightly unacceptable
- 4 – Neutral
- 5 – Slightly acceptable
- 6 – Acceptable
- 7 – Perfectly Acceptable

Level of Appropriateness
- 1 – Absolutely inappropriate
- 2 – Inappropriate

My beliefs
- 1 – Very untrue of what I believe
- 2 – Untrue of what I believe
- 3 – Somewhat untrue of what I believe
- 4 – Neutral
- 5 – Somewhat true of what I believe
- 6 – True of what I believe
- 7 – Very true of what I believe

Priority:

Level of Support/Opposition
- 1 – Strongly oppose
- 2 – Somewhat oppose
- 3 – neutral
- 4 – Somewhat favor
- 5 – Strongly favor

Level of Probability
- 1 – Not probable
- 2 – Somewhat improbable
- 3 – Neutral
- 4 – Somewhat probable

Level of Acceptability
- 1 – Totally unacceptable
- 2 – Unacceptable
- 3 – Slightly unacceptable
- 4 – Neutral
- 5 – Slightly acceptable
- 6 – Acceptable
- 7 – Perfectly Acceptable

- 3 – Sometimes but   **Affect on X**   **Frequency**

Response Anchors

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Level of Acceptability
- 1 – Totally unacceptable
- 2 – Unacceptable
- 3 – Slightly unacceptable
- 4 – Neutral
- 5 – Slightly acceptable
- 6 – Acceptable
- 7 – Perfectly Acceptable

I find the existence of cats in the world:
- ❑ Totally unacceptable
- ❑ Unacceptable
- ❑ Slightly unacceptable
- ❑ Neutral
- ❑ Slightly acceptable
- ❑ Acceptable
- ❑ Perfectly acceptable

Response Anchors

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Level of Acceptability
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- 4 – Neutral
- 5 – Slightly acceptable
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If my flat mate used a microwave app all the time I would find the situation:

- ❑ Totally unacceptable
- ❑ Unacceptable
- ❑ Slightly unacceptable
- ❑ Neutral
- ❑ Slightly acceptable
- ❑ Acceptable
- ❑ Perfectly acceptable

Response Anchors

Psychologists have been working for quite some time to determine the least biased way to present a set of answers.

On the right are a set of response anchors that are known to work well.

Level of Concern

- 1 – not at all concerned
- 2 – Slightly concerned
- 3 – Somewhat concerned
- 4 – Moderately concerned
- 5 – Extremely concerned

If an app could turn on the camera at any time, I would be:

- ❑ Not at all concerned
- ❑ Slightly concerned
- ❑ Somewhat concerned
- ❑ Moderately concerned
- ❑ Extremely concerned

Questionnaire design looks easy but is actually very challenging to do correctly.

Case studies

- Requirements gathering
  - Retrospective study of people's experiences around software updating
- Theory testing
  - Can people correctly read URLs?
- Interface testing
  - Pre/post questionnaire paired with system evaluation

Case study 1: Software updates

What does the current software update process look like for people when it goes badly and when it goes well?

Survey on Mechanical Turk

- 12 demographic questions
- *Please share with us an update-related experience*
- 17 follow-up questions including:
  - Do you consider this update experience to be positive or negative?
  - How did you become aware of the update?
  - Why did/didn't you install this update?
- *For contrast, we would also like you to tell us about a [positive/negative] update experience*

Demographics

- What is your age?
- What is your gender?
- What is your Race? (Multiple answer)
- What is your nationality?
- What is your country of residence?
- How long have you lived in your country of residence?
- What is the highest level of education you have achieved?
- What kinds of computing devices do you usually use?
- What type of computer do you use most often?
- Have you ever worked in a "high tech" job such as computer programming, IT, or computer networking?
- To what extent do you agree or disagree with each of the following statements:
  - I often ask others for help with the computer
  - Others often ask me for help with the computer
- In terms of your internet skills do you consider yourself to be:

Fill in the blank type question

Q2: What is your age?

Q8: What is the highest level of education you have achieved?

( ) High school or less

( ) Some College

Typical multiple choice question

( ) Bachelor's Degree

( ) Master's Degree

( ) Doctorate Degree

Scale where multiple questions are meant to be summed together

Q12: To what extent do you agree or disagree with each of the following statement

Please select one answer per row

	Strongly Disagree	Disagree	Neither Agree or Disagree	Agree	Strongly Agree
I often ask others for help with the computer	◯	◯	◯	◯	◯
Others often ask me for help with the computer	◯	◯	◯	◯	◯

Q13: In terms of your Internet skills, do you consider yourself to be:

( ) Not at all skilled

Likert scale question using a pre-defined anchor

( ) Not very skilled

( ) Fairly skilled

( ) Very skilled

( ) Expert

Retrospective question

Please share with us an update-related experience. This can be any experience you have had while updating software on any device such as a phone, came console, computer, or tablet. Or any experience wher eyou decided not to install an update. This can be any event involving an update such as the last time a piece of software asked you to update it, or when you noticed that your software had changed due to an update.

Please select an update experience for which you can most easily recall details about where you were and what happened when you installed (or chose not to install) the update. You will be answering further questions about this experience in the next two pages.

In a couple of sentences please summarize what happened in your own words.

Follow-up questions

- How long ago did this update take place?
- What device were you using at the time?
- Where were you when the update event happened?
- How did you become aware of the update?
- Do you consider this update experience to be positive or negative?
- Read each of the following statements:
  - If you could go back, would you choose to install this software update?
  - Based on this experience how likely are you to install future updates to this software?
- How did this update experience make you feel?
- Did you ultimately install the update?
- Why did you install the update? (multi-select)
- Did you have any trouble or problems while updating?
- Did you attempt to learn about the update by reading online before installing it?
- Did the update take more or less time than you expected?
- Did the update ask you to reboot after you finished installing?
- After installing the update, do you think your device became less or more secure?

Survey on Mechanical Turk

- 307 responses
- 592 usable stories
- Mean of 35 words
- First stories were:
  - 49% Negative
  - 29% Neutral
  - 21% Positive

- 133 Women, 174 Men
- Mean age 35
  - min of 18
  - max of 74
- 26.7% had worked in a technical job such as computer programming
- High self efficacy
  - 10% ask others for help
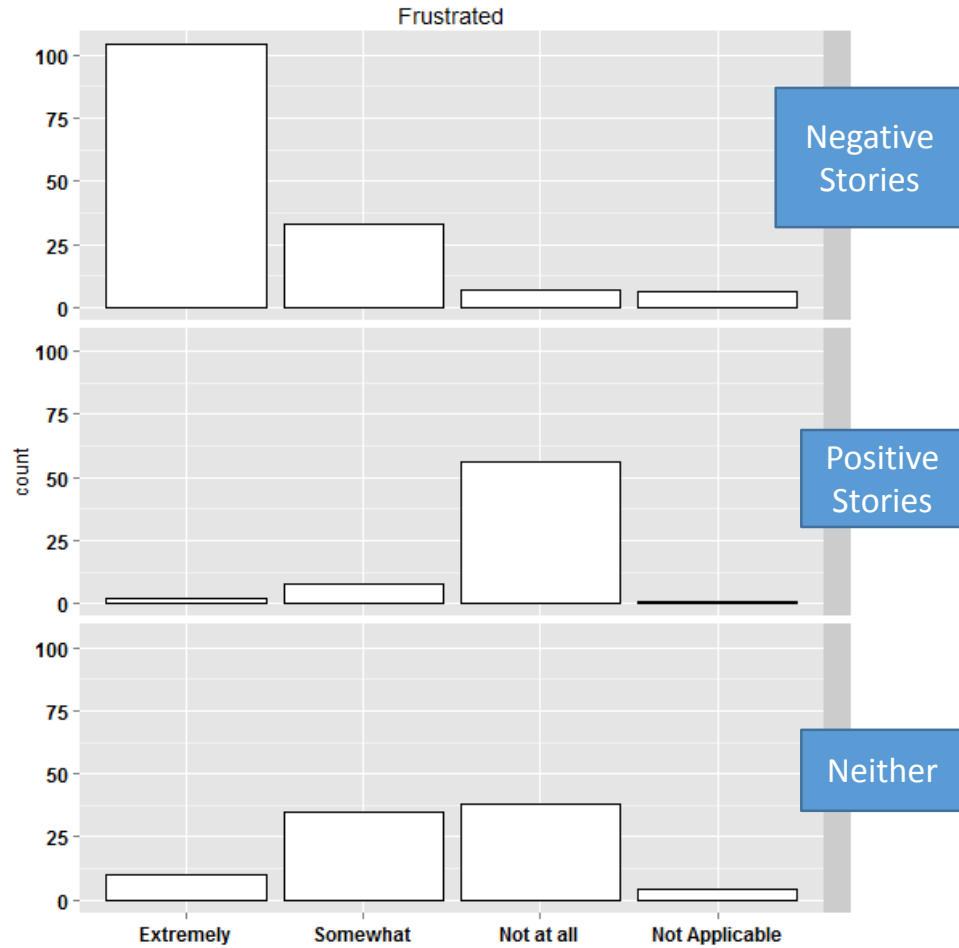 - 72% get asked for help

Combine question answers

Q22: Do you consider this update experience to be positive or negative?

( ) Bad/negative update experience

( ) Neither negative or positive experience

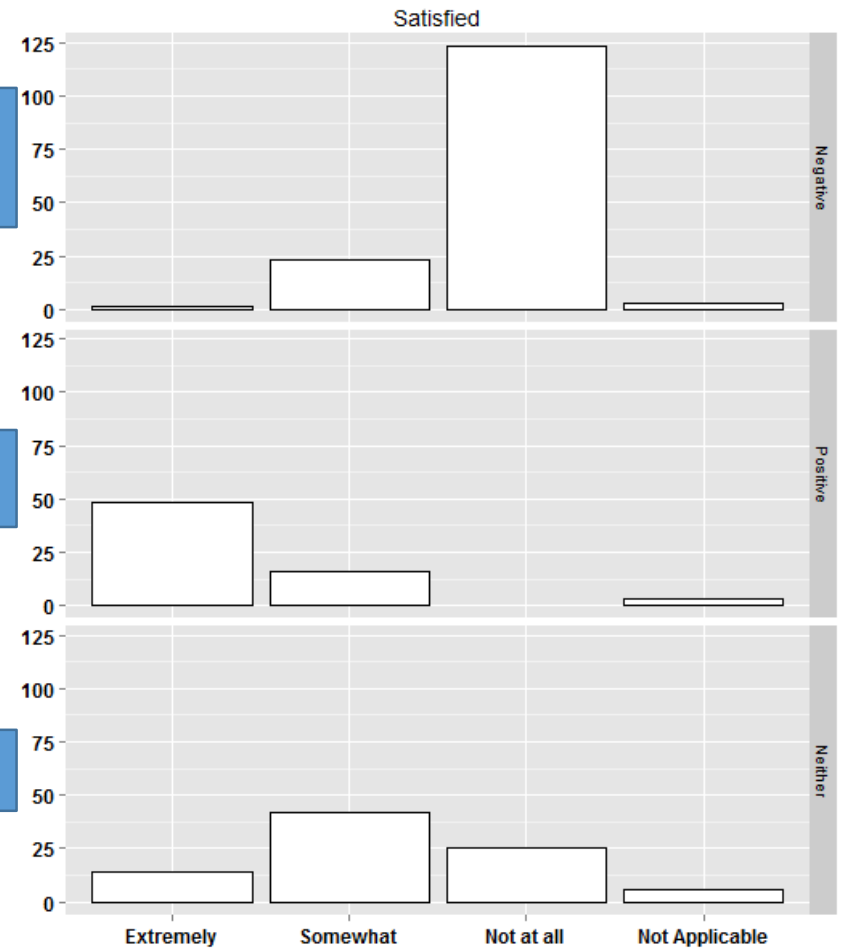( ) Happy/positive update experience

( ) Not Applicable (NA)

Q24: How did this update experience make you feel?

	Not at all	Somewhat	Extremely	Not Applicable
Satisfied	○	○	○	○
Disrupted	○	○	○	○
Frustrated	○	○	○	○
Empowered or in control	○	○	○	○
Regretful	○	○	○	○
Angry	○	○	○	○
Excited	○	○	○	○

Regretful
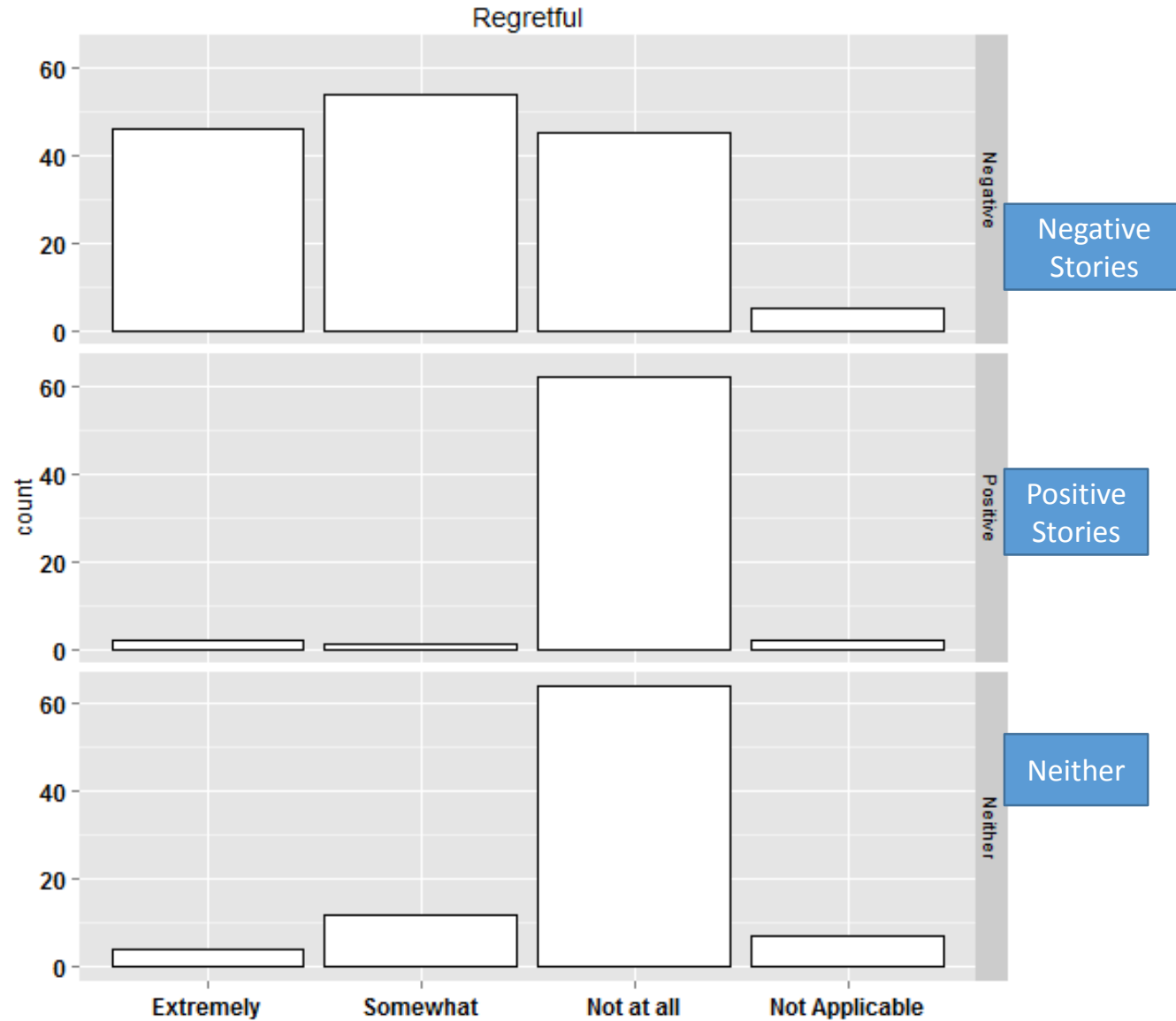
Why did/didn't you install the update?

Reason	Count
I always install updates	118
I thought it was important	109
I trust this software company	90
I use this software frequently, so keeping it updated is important	87
I didn't have a choice	58
It was a security related update	49

Reason	Count
Satisfied with the current version	17
It looked like it would be disruptive	13
I didn't trust the update	13
Compatibility issues	13
Had trouble updating	11
I didn't think it was important	10

Case study 1:
Can people correctly read URLs?

23 URLs presented to each participant

Every URL has the same two questions with similar options

https://profile.travbuddy.com

* If you were to type in the above link into a web browser, what website would open?

○ TravBuddy's website

○ Redirects to another website with a longer link

○ Google's website

○ A website which is not listed

○ Profile's website

○ Other: [   ]

* How safe do you think it would be to click on the link above if you saw it in an email from someone you know?

○ Not safe

○ Somewhat unsafe

○ Neutral

○ Somewhat safe

○ Very safe

2. Subdomain

RQ1. Can people correctly identify that a URL will go to the organization listed in the **domain** position of the URL rather than the **subdomain**?

6 with a company name in the **subdomain**

https://facebook.profile.com

https://profile.facebook.com

6 with a company name in the **domain**

URL Structure	Orgnization Industry	Orgnization Recognizablity	Organization Name	URL	
				Group 1	Group 2
Domain Only			Microsoft	https://microsoft.com	
			Google	https://google.com	
			AMT	https://mturk.com (AMT participants only)	
			PA	https://prolific.ac (PA participants only)	
Single Subdomain	Social	Well known	Facebook	https://facebook.profile.com	https://profile.facebook.com
			Twitter	https://mobile.twitter.com	https://twitter.mobile.com
		Unknown	Travelbuddy	https://profile.travelbuddy.com	https://travelbuddy.profile.com
			Weheartit	https://weheartit.mobile.com	https://mobile.weheartit.com
	News	Well known	BBC	https://bbc.profile.com	https://profile.bbc.com
			CNN	https://mobile.cnn.com	https://cnn.mobile.com
		Unknown	Dunfermlinepress	https://profile.dunfermlinepress.com	https://dunfermlinepress.profile.com
			Haysfreepress	https://haysfreepress.mobile.com	https://mobile.haysfreepress.com
	Financial	Well known	Paypal	https://paypal.profile.com	https://profile.paypal.com
			Western Union	https://mobile.westernunion.com	https://westernunion.mobile.com
		Unknown	Purepoint	https://profile.purepoint.com	https://purepoint.profile.com
			Revolut	https://revolut.mobile.com	https://mobile.revolut.com
Shortener		Well known	Bit.ly	https://bit.ly/1bdDIXc	
			Goo.gl	https://goo.gl/fJOIAv	
		Unknown	Po.st	https://po.st/If6RgX	
			U.to	https://u.to/SbwC	
Complex			Google	https://facebook.com@google.com	
			Twitter	https://twitter.com/facebook.com	
			Facebook	https://facebook.com/picture.html?a=twitter.com	
			Facebook	https://facebook.com/?url=twitter	

Case study 3:
Usability of an interactive password tutorial system

Evaluating an existing system

Level 3 - Automated Brute-Force Attack

Thanks to the previous level, we know that Alice's password is exactly **3 digits** long. We cannot manually brute force this as we did in Level 1 since this will take too long. You will therefore need to **automate** the process.

We already know that the passwords are submitted using **GET requests** and that the correct password will return a **status code of 200**. We suggest you use Python to write a script which will replicate this request for each possible password, until you find the correct one. You may want to use the Python requests library for this.

Hint 1

Hint 2

Password

Submit

Answer before you start

Please answer the questions below as best you can before starting the tutorial. If you don't know the answer then please select your best guess, or write "I don't know".

1. **We would like to use your answers in research publications and to improve this tutorial.**
   - ○ You may use my answers below in research publications
   - ○ Do not use my answers below in research publications

2. **Which of the following statements describe a POST request? Tick all that apply.**
   - ☐ retrieves information from the web server
   - ☐ sends information to the web server, most likely to be stored
   - ☐ data is enclosed in the body of the HTTP request
   - ☐ data is visible in the URL

3. **What is the status code of a successful HTTP request?**
   _____

4. **Which of the following statements best complete this description of a dictionary attack? An attacker performs a dictionary attack by systematically submitting:**
   - ○ all possible password combinations
   - ○ all the words in the English dictionary
   - ○ all the passwords in a pre-established list of passwords
   - ○ what is a dictionary attack?

5. **How would a developer secure their website against a brute force attack? Tick all that apply.**
   - ☐ caching the hashes of the users' passwords
   - ☐ account lock out if too many incorrect attempts
   - ☐ sanitising user input
   - ☐ rate limiting

Answer after you are done

After you have completed the tutorial, please answer the questions below as best you can. If you don't know the answer then please select your best guess, or write "I don't know".

9. **How many levels did you complete?**

   _____

10. **Which of the following statements describe a POST request? Tick all that apply.**
    - ☐ retrieves information from the web server
    - ☐ sends information to the web server, most likely to be stored
    - ☐ data is enclosed in the body of the HTTP request
    - ☐ data is visible in the URL

11. **What is the status code of a successful HTTP request?**

    _____

12. **Which of the following statements best complete this description of a dictionary attack? An attacker performs a dictionary attack by systematically submitting:**
    - ○ all possible password combinations
    - ○ all the words in the English dictionary
    - ○ all the passwords in a pre-established list of passwords

13. **How would a developer secure their website against a brute force attack? Tick all that apply.**
    - ☐ caching the hashes of the users' passwords
    - ☐ account lock out if too many incorrect attempts
    - ☐ sanitising user input
    - ☐ rate limiting

14. **Which of the following statements best describes a cryptographic hash function?**
    - ○ hard to compute, hard to invert
    - ○ hard to compute, easy to invert

Survey data analysis from last year

1. What is your gender?

   ○ Female
   ○ Male
   ○ Prefer not to answer
   ○ Other, please state ....

2. What is your age in years? ....

3. What what degree program (major) are you in? ....

4. What is your native language? ....

5. Which of the following types of technology do you use?

	Do not have one	Rarely	Weekly	Daily
Smartphone	☐	☐	☐	☐
Tablet	☐	☐	☐	☐
Gaming Console	☐	☐	☐	☐
Laptop	☐	☐	☐	☐
Desktop	☐	☐	☐	☐

6. How often do the following happen?

	Never	Rarely	Sometimes	Often	Always
I ask other people for help with computers	☐	☐	☐	☐	☐
Other people ask me for help with computers	☐	☐	☐	☐	☐

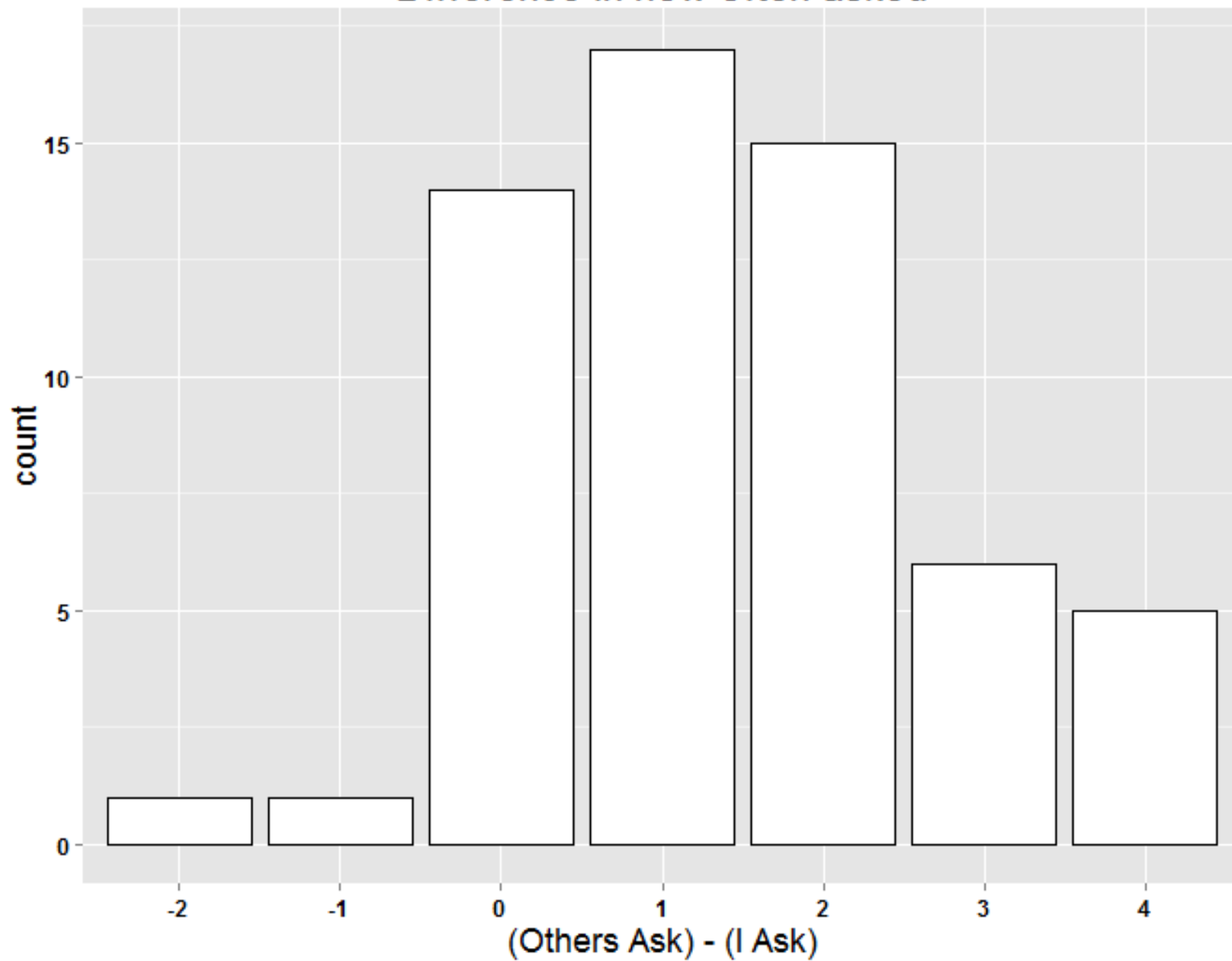These questions are intended to be compared to each other.

Think-pair-share

What can we conclude about this population?
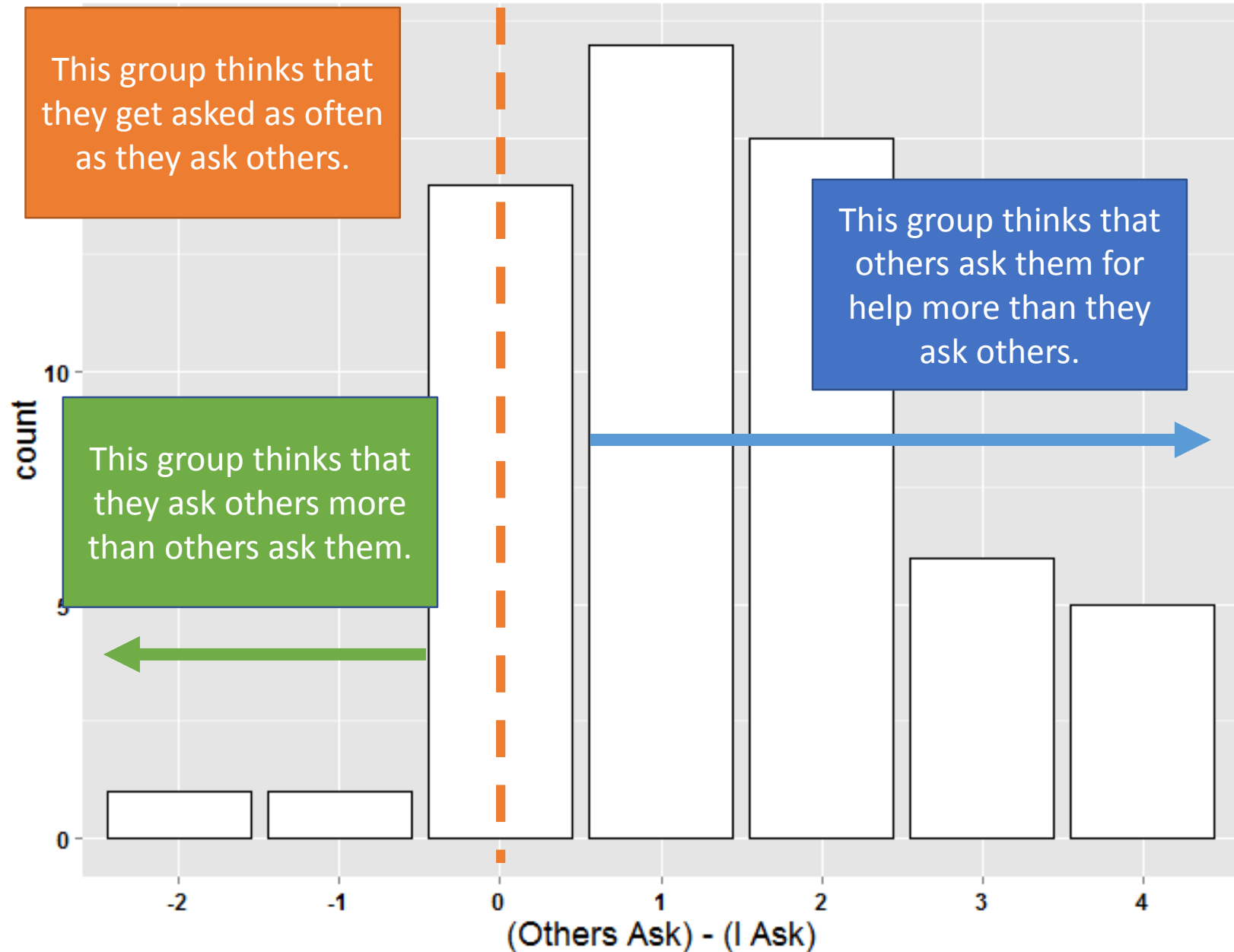
What other way could we analyze this data?

Others Ask Me

I Ask Others
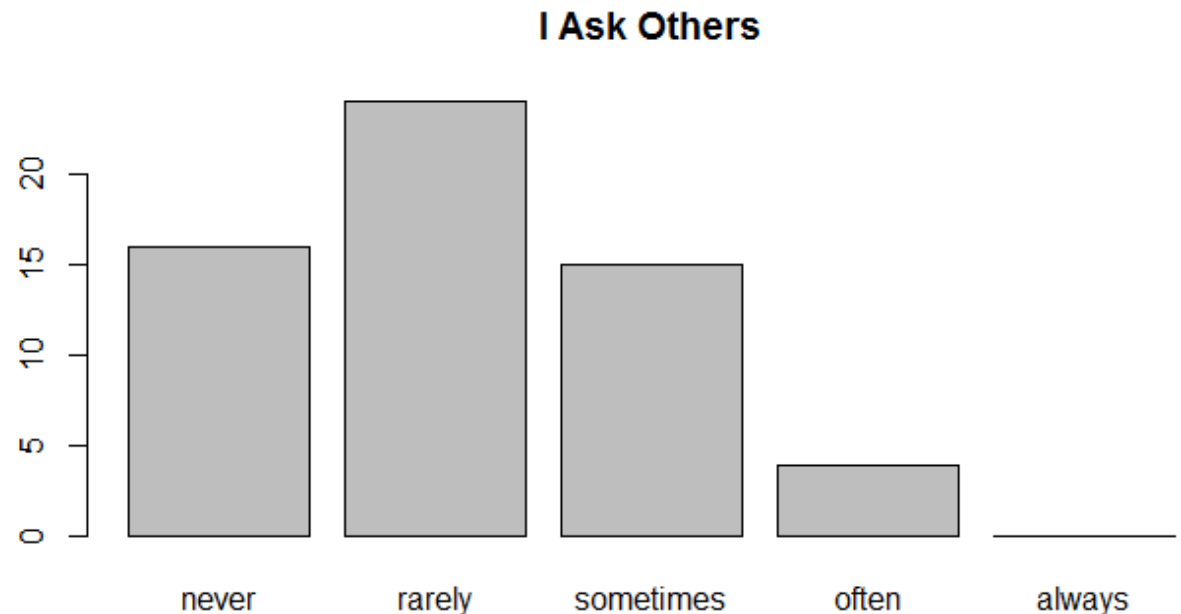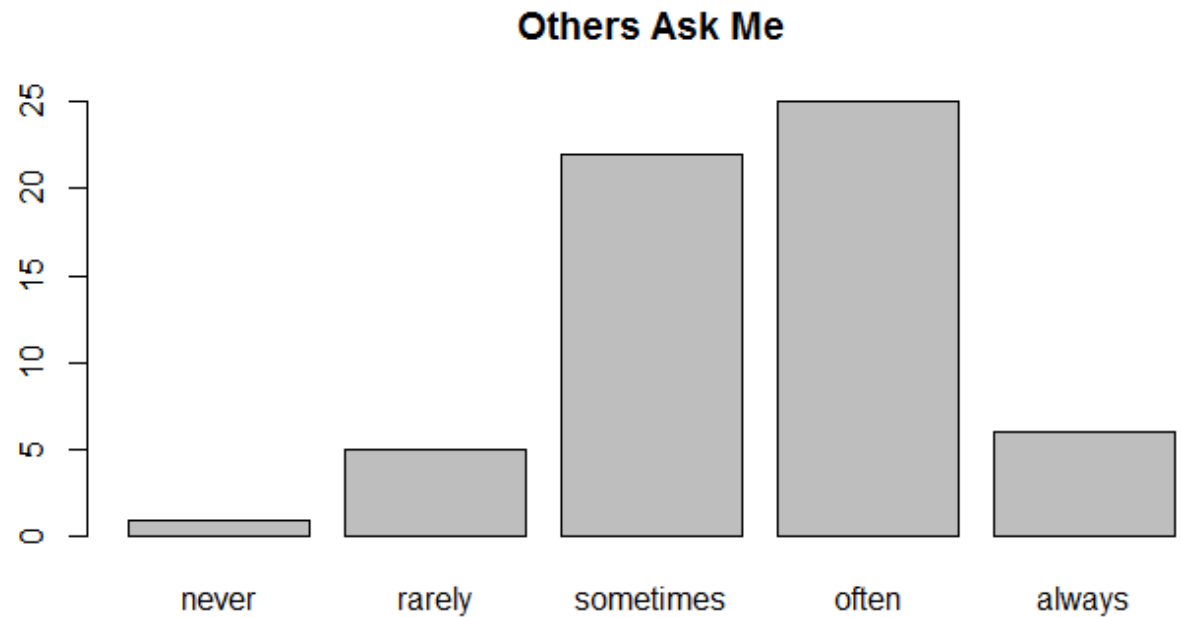
Difference in how often asked

Westin privacy index

7. For each of the following statements, how strongly do you agree or disagree?

	Strongly disagree	Disagree	Neither agree or disagree	Agree	Strongly agree
Consumers have lost all control over how personal information is collected and used by companies	☐	☐	☐	☐	☐
Most businesses handle the personal information they collect about consumers in a proper and confidential way	☐	☐	☐	☐	☐
Existing laws and organizational practices provide a reasonable level of protection for consumer privacy today	☐	☐	☐	☐	☐

Calculating the index

- Convert options to 1-5
(should be 1-4, but the survey mistaking contained a neutral option)
- Fundamentalist
  - Q1 > 3
  - Q2 < 3
  - Q3 < 3
- Unconcerned
  - Q1 < 3
  - Q2 > 3
  - Q3 > 3
- Pragmatists
  - Other

	Count
Privacy Fundamentalists	9
Privacy Pragmatists	51
Privacy Unconcerned	0

Questions