

# Questionnaires / Surveys

Nicole Meng-Schneider

# **What are questionnaires?**

- Ask participants to answer a set of pre-defined questions.
- Similar to a structured interview but on paper or on a computer

How is it different from a survey?

- It's not. Questionnaires refer only to the questions (content) whereas surveys refer to the entire method of study design, data collection, and analysis.

# 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
- no flexibility when asking questions

# 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 (Evaluation)
  - How are people actually using it?
  - What do people think after they use it?

# How to ask 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 X and Y?

# How to ask about...

- Attitudes

In an ideal world, what method of **developing** a Social Story would you prefer? *(tick one)*

Paper-based ☐      Desktop computer ☐      iPad/Tablet ☐

- Behaviors

Do you involve the child in the writing process? *(tick one)*

Always ☐      Often ☐      Sometimes ☐      Rarely ☐      Never ☐

- Conceptualizations

Which of the following best define a Social Story?

☐ an individualized short story that describes social relevant cues in any given situation that

☐ a short story that accurately describes a context, skill or concept according to 10 defining criteria.

- Expectations

What features do you expect to have in the new technology?

☐ Text customisation

☐ Image customisation

...

- Capabilities

What is the result of  $2^3$ ?

☐ 5      ☐ 6      ☐ 8

# Types of Questions

Please describe your recent visit.  
Include details like who came to  
visit and how they reacted to the  
introduction.

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- Open-ended questions

# Types of Questions

Do you own any of the following smart home devices? Select all types of devices you own or live with.

- ☐ smart camera system
- ☐ smart thermostat
- ☐ smart lights
- ☐ smart TV
- ☐ smart home intruder alarm
- ☐ smart washing machine
- ☐ none
- ☐ Other \_\_\_\_\_

- Open-ended questions
- single and multiple choice checkboxes



# Types of Questions

Rank the following smart speaker features based on how happy you are to share them with your flatmates. 1 being the most happy to share and 5 the least.

- Calendar
- Music/Spotify
- Timer/Alarms
- Smart Device Control
- Recipes/Weather

- Open-ended questions
- single and multiple choice checkboxes
- Matching
  - Rank the following from 1 to 5

# Types of Questions

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

# Types of Questions

Your previous answers imply that you are the account owner of your smart speaker.

As the account owner, how would you feel if someone who LIVES IN your household (e.g. partner, family, flatmates) uses each of the features presented below?

Please rate each feature on a scale from "very uncomfortable" (I would hate it if they used this feature) to "very comfortable" (They are very welcome to use this feature.)

	very uncomfortable	somewhat uncomfortable	neutral	somewhat comfortable	very comfortable
Calendar (e.g. "Ok Google, tell me what I have on today" or "Alexa, add a meeting to my calendar")	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Calls, emails, messages (e.g. Drop-in feature, making phone calls, checking emails, or receiving notifications)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Purchase (e.g. "Alexa, order dishwasher tablets")	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Smart Device Control (e.g. "Hey Google, turn the lights on" or "Siri, increase the temperature to 19C")	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Timer or Alarms (e.g. "Alexa, set a timer for 5 minutes")	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Entertainment (e.g. playing back music from Spotify or playing a trivia game)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Getting Information (e.g. asking for weather or news updates, recipes or facts)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

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- single and multiple choice checkboxes
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# 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

Citation:

Vagias, Wade M. (2006). *Likert-type scale response anchors*. Clemson International Institute for Tourism & Research Development, Department of Parks, Recreation and Tourism Management. Clemson University.

### 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
- 3 – Slightly inappropriate
- 4 – Neutral
- 5 – Slightly appropriate
- 6 – Appropriate
- 7 – Absolutely appropriate

### Level of Importance

- 1 – Not at all important
- 2 – Low importance
- 3 – Slightly important
- 4 – Neutral
- 5 – Moderately important
- 6 – Very important
- 7 – Extremely important

### Level of Agreement

- 1 – Strongly disagree
- 2 – Disagree
- 3 – Somewhat disagree
- 4 – Neither agree or disagree
- 5 – Somewhat agree
- 6 – Agree
- 7 – Strongly agree

### Knowledge of Action

- 1 – Never true
- 2 – Rarely true

### 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:

- 1 – Not a priority
- 2 – Low priority
- 3 – Somewhat priority
- 4 – Neutral
- 5 – Moderate Priority
- 6 – High priority
- 7 – Essential priority

### Level of Concern

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

### Priority Level

- 1 – Not a priority
- 2 – Low priority
- 3 – Medium priority
- 4 – High priority
- 5 – Essential

### Level of Problem

- 1 – Not at all a problem
- 2 – Minor problem
- 3 – Moderate problem
- 4 – Serious problem

### 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
- 5 – Very probable

### Level of Agreement

- 1 – Strongly disagree
- 2 – Disagree
- 3 – Neither agree or disagree
- 4 – Agree
- 5 – Strongly agree

### Level of Desirability

- 1 – Very undesirable
- 2 – Undesirable
- 3 – neutral
- 4 – Desirable
- 5 – Very desirable

### Level of Participation

- 1 – No, and not considered
- 2 – No, but considered
- 3 – Yes

### Frequency – 5 point

- 1 – Never
- 2 – Rarely
- 3 – Sometimes
- 4 – Often
- 5 – Always



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- 5 – Slightly acceptable
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- 7 – Perfectly Acceptable

If my friends visited and used my smart speaker all the time, I would find that:

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

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# Established Scales

- Set of questions and answer choices regarding an object or concept
- Thoroughly developed, tested, and reviewed by researchers to have desired effect
- Questions and answers should never be changed
- Examples:
  - IUIPC scale for internet users' information privacy concerns\*
  - System Usability Scale (SUS)\*\*

The System Usability Scale  
Standard Version

		Strongly Disagree					Strongly Agree				
		1	2	3	4	5	1	2	3	4	5
1	I think that I would like to use this system frequently.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2	I found the system unnecessarily complex.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3	I thought the system was easy to use.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4	I think that I would need the support of a technical person to be able to use this system.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5	I found the various functions in this system were well integrated.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6	I thought there was too much inconsistency in this system.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7	I would imagine that most people would learn to use this system very quickly.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8	I found the system very awkward to use.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9	I felt very confident using the system.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
10	I needed to learn a lot of things before I could get going with this system.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

SUS questions. Image from \*\*Lewis,2018

\*Naresh K. Malhotra, Sung S. Kim, and James Agarwal. Internet users' information privacy concerns (IUIPC): the construct, the scale, and a causal model. Inf. Syst. Res., 15(4):336–355, 2004.

\*\* Lewis, J. R. (2018). The System Usability Scale: Past, Present, and Future. International Journal of Human–Computer Interaction, 34(7), 577–590.  
<https://doi.org/10.1080/10447318.2018.1455307>



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

# How to write questions

Three goals:

1. It measures the underlying concept it is intended to tap
2. It doesn't measure other concepts
3. It means the same thing to all respondents

# How to write questions

- Avoid technical terms and jargon
- Avoid Vague or Imprecise Terms
- Define Things Very Specifically
- Avoid Complex Sentences
- Provide Reference Frames
- Make Sure Scales Are Ordinal
- Avoid Double-Barreled Questions
- Answer Choices Should Anticipate All Possibilities
- If You Want a Single Answer, Make Sure Your Answer Choices Are Unique and Include all Possible Responses
- Avoid Questions Using Leading, Emotional, or Evocative Language

# When designing a survey...

- Don't Reinvent the Wheel
  - The General Social Survey:  
<http://www.gss.norc.org/>
  - The National Election Survey:  
<http://www.umich.edu/%7Enes/>
- Pre-Test Your Questionnaire
- Think About The Mode of Your Questionnaire
- Keep Your Questionnaire Short
- Keep Question Order in Mind
- Filtering and Branching

# Case study: Software updates

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

Published in: Kami Vania and Yasmeen Rashidi. 2016. Tales of Software Updates: The process of updating software. In Proceedings of the 2016 CHI Conference on Human Factors in Computing Systems (CHI '16). Association for Computing Machinery, New York, NY, USA, 3215–3226. <https://doi.org/10.1145/2858036.2858303>

# Survey Design

- 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:

# Demographics

Fill in the  
blanks type  
question

Q2: What is your age?

Typical multiple  
choice question

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

- ☐ High school or less
- ☐ Some College
- ☐ 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	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Others often ask me for help with the computer	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Likert scale question  
using a pre-defined  
anchor

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

- ☐ Not at all skilled
- ☐ 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, game console, computer, or tablet. Or any experience where you 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?

# Participants (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

# Analysis: Combine Question Answers

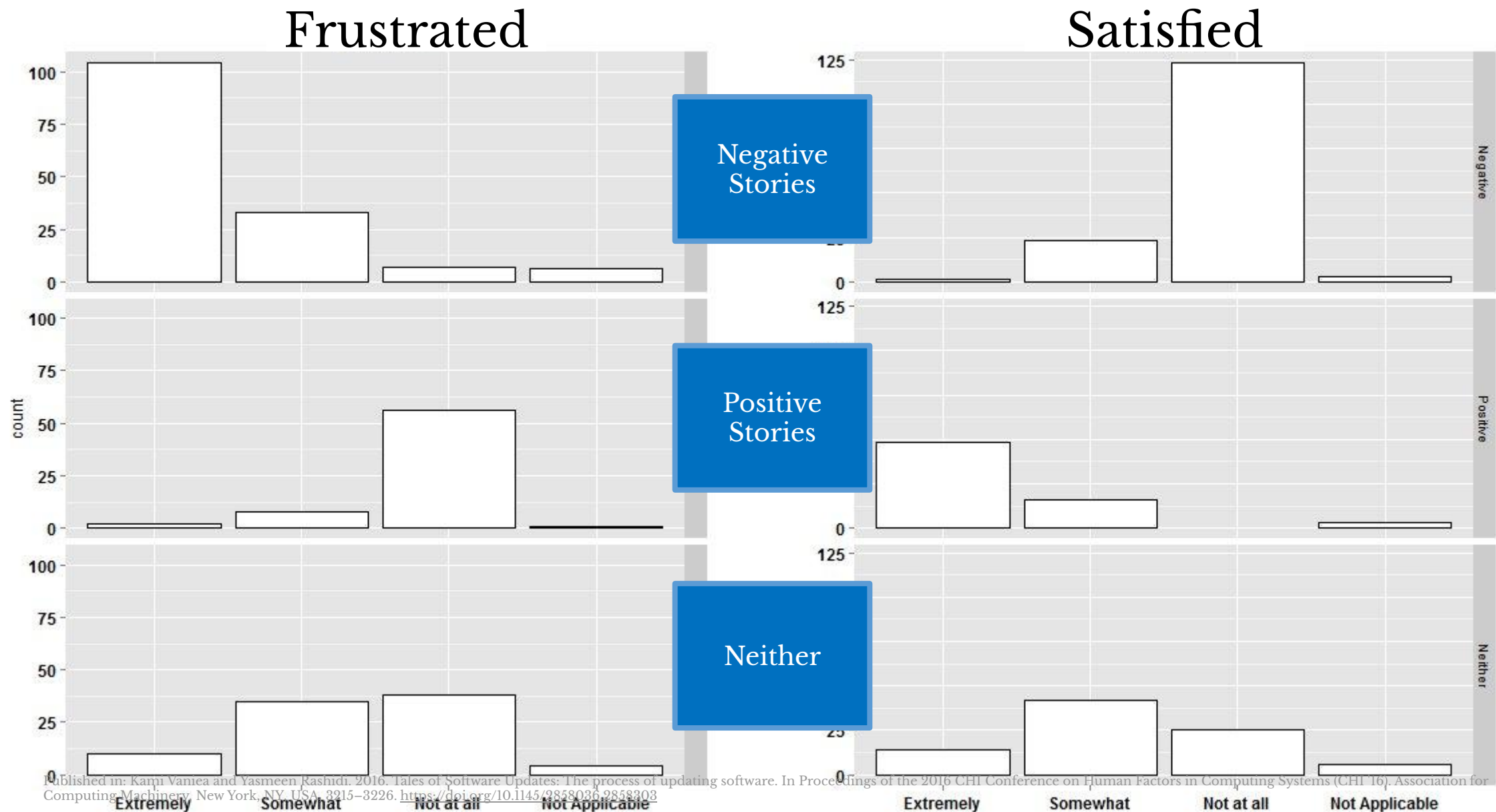
**Q22:** Do you consider this update experience to be positive or negative?

- ☐ 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?

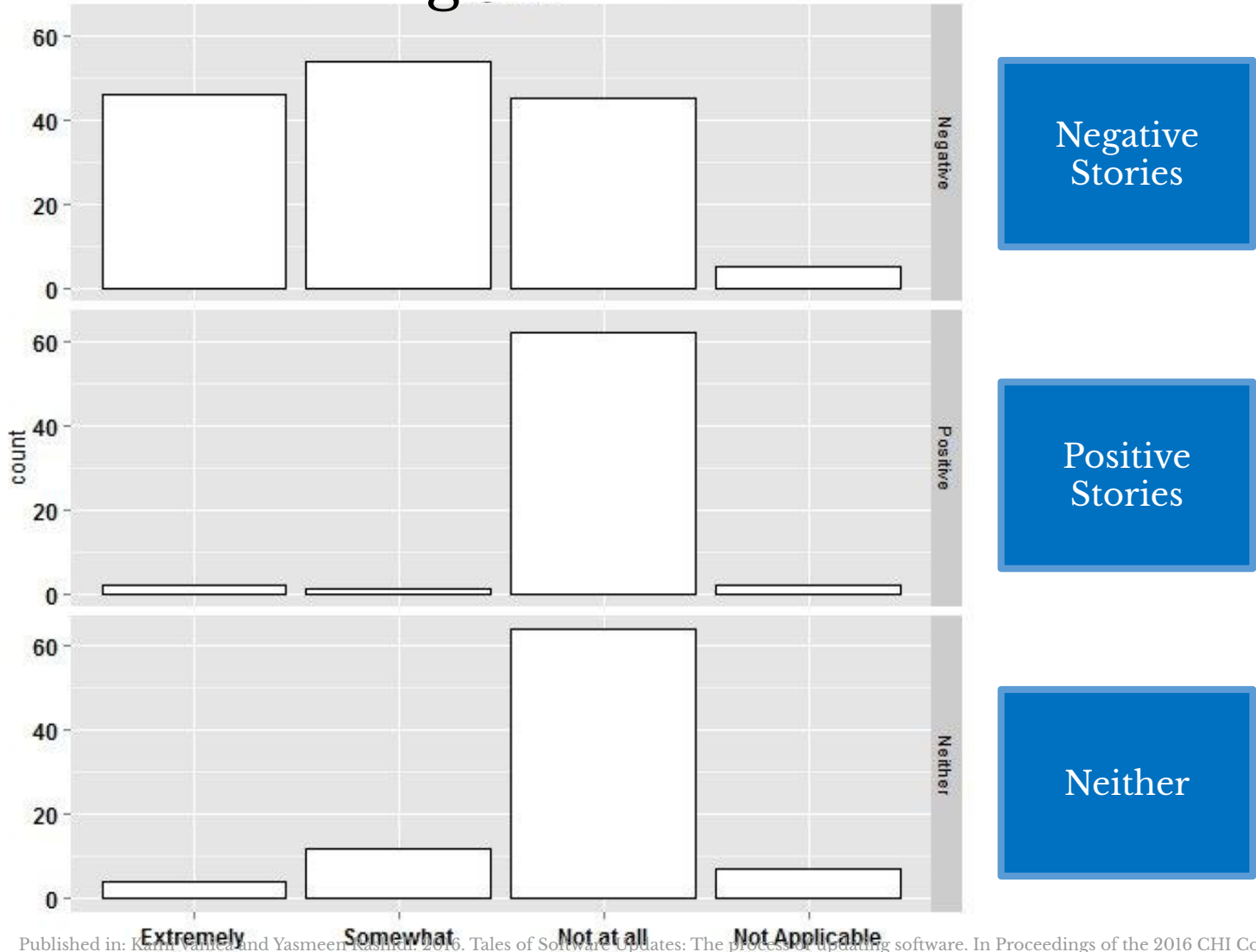
	Not at all	Somewhat	Extremely	Not Applicable
Satisfied	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Disrupted	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Frustrated	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Empowered or in control	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Regretful	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Angry	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Excited	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

# Analysis: Generate Graphs



# Analysis: Other Graph

## 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

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