

Questionnaires and Surveys:
Gathering Data

Jon Kolko
 Savannah College of Art & Design

Overview

- What is it?
- What is it for?
- Problems with Questionnaires
- Understanding Sampling and – eek – statistics!
- Types of Questionnaires

What Is It?

- Generally, a printed form with questions is distributed to a large quantity of people (our **sample population**)
- The individuals respond to the questions, and the forms are collected
- The data is accumulated, and can then be plotted to visualize the various responses



What Is It For?

Same purposes as the other Contextual Research Methods we have learned:



However, questionnaire data is prone to error.
Why is questionnaire data prone to error?

What Is It For?

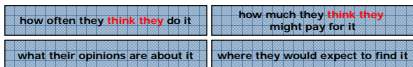
Ethnography (specifically, Contextual Inquiry) showed us:



Questionnaires and Surveys will show us:



Additionally, we can learn:



What Is It For?

Contextual Inquiry	Traditional Interviews	Questionnaires
Develop a partnership with real users to observe focused work in its actual context	User provides verbal responses to a series of pre-determined questions focusing around an area of work	Distribute materials to a small sample of a target population in order to understand the whole population
We gather "concrete", detailed data about what occurs in the context of a user's work	We gather "once-removed", detailed anecdotes about what occurs in the context of a user's work	We gather brief but quantitative data that, hopefully, can be generalized
Perform a Contextual Inquiry when you have access to work that can be readily interrupted. CI will present the richest data	Use Interviews when you cannot interrupt the work to ask questions, or the work is intermittent, or you cannot visit the work site in person	Use Questionnaires when you want to make definitive statements or "prove" your findings to a skeptical audience

Problems with Questionnaires

Perhaps the most overused research technique available. Consider how often you experience a "questionnaire":

• Standardized testing	• Gallup (voting) polling
• At the mall	• On the internet
• In magazines	• At the movies
• On the telephone	• In college
• At the bank	• While paying your bills
• At the dentist	• At the grocery store

Why is this problematic?

1. Validity of **Gathered Data** (for example, did they lie?)
2. Validity of **Sample Size** (can we generalize from our sample to the whole population?)
3. We never learn **why!**

IDUS215 - Contextual Research Methods | 7

Benefits of Questionnaires

1. We can understand the population through a **small sample**.
2. We can gather more data in a **shorter period of time**
3. We can create statistical evidence to **prove our findings** to a skeptical audience.

Why would we ever need to prove our findings, and to whom?

IDUS215 - Contextual Research Methods | 8

Understanding Sampling | An Example

You are creating a new backpack for college students in the US, and are in the initial design phases. You conduct a questionnaire to determine what people generally carry around with them, and their backpack preferences.



Some questions we care about:

1. **Whom do we give the questionnaire to?**
2. **How sure will we be that the results of our questionnaire are valid?**
3. **How many people should we give the questionnaire to?**

IDUS215 - Contextual Research Methods | 9

Understanding Sampling | An Example

1. Whom do we give the questionnaire to?

What if we give our questionnaire to students in the Gulfstream Center for Design?

Our backpack may end up having no room for books and an awful lot of little holders for prismacolor markers ..

What if we give our questionnaire to everyone between 18 and 25 at the mall?

We may end up creating a backpack for people who never have attended and never intend to attend college ..

What if we give our questionnaire to anyone we find?

We may end up with a backpack that is great for adults – and that college kids wouldn't be caught dead in ..



IDUS215 - Contextual Research Methods | 10

Understanding Sampling | An Example

1. Whom do we give the questionnaire to? (continued)

Thus, we give our questionnaire to **randomly selected members** of our **target population** (people who match our end target of design).

The people we give our questionnaire to become our **sample population, or n value**.

What does "randomly selected" mean?



IDUS215 - Contextual Research Methods | 11

Understanding Sampling | An Example

2. How sure will we be that the results of our questionnaire are valid?

We need to select a **confidence interval** and a **confidence level**.

Confidence Interval (CI): The plus or minus range of values we care about.

If 47% of our sample population desires a blue backpack, and our **CI is 4**, then we can be "sure" that between 43% (47%-4) and 51% (47%+4) of all of the target population would have selected this.

If 47% of our sample population desires a blue backpack, and our **CI is 1**, then we can be "sure" that between 46% (47%-1) and 48% (47%+1) of all of the target population would have selected this.

Generally, A lower CI is better, but more expensive.



IDUS215 - Contextual Research Methods | 12

Understanding Sampling | An Example

2. How sure will we be that the results of our questionnaire are valid? *(continued)*

We need to select a **confidence interval** and a **confidence level**.



Confidence Level: How sure are you that the answers from your sample can be generalized to the entire target population.

If our confidence level is **95%**, we are **95%** certain that our questionnaire results can be generalized to the entire target population (or, **95** out of 100 times, our results will generalize correctly).

If our confidence level is **99%**, we are **99%** certain that our questionnaire results can be generalized to the entire target population (or, **99** out of 100 times, our results will generalize correctly).

Generally, a higher level of confidence is better, but more expensive.

IDUS215 - Contextual Research Methods | 13

Understanding Sampling | An Example

3. How many people should we give the questionnaire to?

First, we need to know how large the **entire target population of end users is** – in this case, how many college students are there in the United States.



US Census tells us: **15.5 million** (in 1998).

What if we give our questionnaire to all of them (ie, our sample population is the same as our target population; $n=15.5$ million)?

IDUS215 - Contextual Research Methods | 14

Understanding Sampling | An Example

3. How many people should we give the questionnaire to? *(continued)*

Using the sample size calculator available at <http://www.surveysystem.com/sscalc.htm> we find out that:



A Confidence Level of **99%** and a Confidence Interval of plus or minus **1** requires **16,623** people.

A Confidence Level of **95%** and a Confidence Interval of plus or minus **2** requires **2401** people.

A Confidence Level of **95%** and a Confidence Interval of plus or minus **4** requires $n=384$ people.

IDUS215 - Contextual Research Methods | 15

Understanding Sampling | An Example

3. How many people should we give the questionnaire to? *(continued)*

A Confidence Level of **95%** and a Confidence Interval of plus or minus **4** requires $n=384$ people.



If we perform this survey, and find out that 80% of all of our respondents prefer a blue backpack over all other colors, we can now say:

"We are 95% sure that between 75% and 85% of all 15.5 million college students will prefer a blue backpack over all other colors".

That's pretty compelling evidence!

IDUS215 - Contextual Research Methods | 16

Understanding Sampling | An Example

3. How many people should we give the questionnaire to? *(continued)*

It works the other way, too. If we send out our **384** questionnaires, but only get **20** back, and **16** of them prefer a blue backpack over all other colors (**80%**), we get a confidence interval of **plus or minus 17**. We can now say:



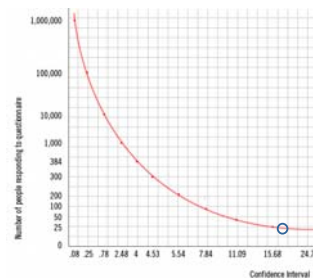
"We are 95% sure that between 63% and 97% of all 15.5 million college students will prefer a blue backpack over all other colors".

That's still pretty compelling evidence, with a much smaller sample population ($n=20$ students)!

IDUS215 - Contextual Research Methods | 17

Understanding Sampling | An Example

3. How many people should we give the questionnaire to? *(continued)*



"We are 95% sure that between 63% and 97% of all 15.5 million college students will prefer a blue backpack over all other colors".

$(n=20, CI=17)$

IDUS215 - Contextual Research Methods | 18

Understanding Sampling | An Example

Key takeaways:

- You need to sample **only from within the target population** (if designing for college students, only sample college students)
- You **don't** need to sample the entire target population to get valid results
- A larger sample yields more accurate results, but with **diminishing returns**
- You need to know the **size of the target population**, a **confidence interval** (CI) and a **confidence level** in order to determine your **sample size** (n)
- You need to **randomly** select your sample out of the entire target population
- Surveying arbitrary (or convenient) people is perhaps the worst thing you can do!**



IDUS215 - Contextual Research Methods | 19

Writing Questionnaires

- Before creating your questionnaire, identify the **three main things you wish to learn**. Structure all questions around these three things.
- Use no more than one sheet of paper, single sided.
- Use basic language (no "lingo" or "jargon").
- Spell check your work.
- Test your questionnaire before you actually conduct your survey.

IDUS215 - Contextual Research Methods | 20

Types of Questionnaires

- Multiple Choice.
- Likert Attitude Scale.
- Dichotomous Scale.
- Semantic Differentials.
- Ranking/Rating Scales.

IDUS215 - Contextual Research Methods | 21

Types of Questionnaires | Multiple Choice

A question, followed by a series of choices.

Which of the following backpacks would you be most likely to purchase?



IDUS215 - Contextual Research Methods | 22

Types of Questionnaires | Likert Attitude Scale

Determine the extent of agreement or disagreement.



- | | |
|---|---|
| | Strongly agree
Agree
Neither agree or disagree
Disagree
Strongly disagree
No opinion |
| 1. This backpack would make me look sexy. | ● ● ● ● ● ● |
| 2. This backpack is comfortable. | ● ● ● ● ● ● |
| 3. This backpack looks ugly. | ● ● ● ● ● ● |
| 4. This backpack looks expensive. | ● ● ● ● ● ● |

IDUS215 - Contextual Research Methods | 23

Types of Questionnaires | Dichotomous Scale

A question, followed by two potential answers (*dichotomous* means *branching into two paths*).



1. Would you buy this backpack?	Yes	No
2. Is this backpack attractive to you?	Yes	No
3. Do you like the way this backpack looks?	Yes	No
4. Is this backpack too bulky?	Yes	No

IDUS215 - Contextual Research Methods | 24

Types of Questionnaires | Semantic Differentials

Sets of opposite adjectives that describe a project.



Circle the characteristics that best describe the pictured backpack.

Loud	Quiet
Happy	Sad
Beautiful	Ugly
Hip	Lame
Stylish	Dated
Comfortable	Bulky
Playful	Practical

IDUS215 - Contextual Research Methods | 25

Types of Questionnaires | Ranking / Rating Scales

Sets of characteristics that must be ordered by the participant.



Rank the following characteristics of backpacks in order from most important (6) to least important (1) by writing 1-6 in the space provided.

Characteristic	Ranking
Ability to hold many items	
Specific pockets for specific items	
Can be cleaned in the washing machine	
Low in cost	
Durable	
Has a particular logo on it	

IDUS215 - Contextual Research Methods | 26

Distributing Your Questionnaire

Because you want to make sure you have a **randomly selected** sample that **clearly represents the entire target population**, you need to:

1. Gather a list of the entire target population
2. Randomly select names from it
3. Distribute your questionnaire to these names

How do you do this?

IDUS215 - Contextual Research Methods | 27

Summary

- Problems with Questionnaires
- Understanding Sampling and Statistics
- Types of Questionnaires
- Distributing Your Questionnaire

Coming next: **What do we do with the data?**

IDUS215 - Contextual Research Methods | 28