

Recap: Analyzing and Interpreting Data

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Linguistics 390a
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1 Plan for Today

- Recap of handling and interpreting data
- Go over potential issues and questions in small groups
- Discuss specific questions you have about your projects

2 How to organize your data

- You'll need to compute averages for each condition.
- For statistical analyses and for looking at your data in more detail (especially if your results are not very clear cut), you will also need the averages for each subject in each condition (and each item)

A) Design 1: Rating on a scale:

Format for entering data:

Subject	Sentence	Condition	Rating Score
1	1	A	3
1	2	B	2
2	1	A	5
2	2	B	4
3	1	A	2
3	2	B	4
...			

In Excel, it's easy to automatically compute averages with the 'AVERAGE' function. Just enter '=average(COLUMNROW_{firstcell}:COLUMNROW_{lastcell})' in a cell, and it will display the average for the range of cells specified (you may need to sort the data by condition to easily compute condition averages).

→ See DataAnalysis.pdf (follow link to 'Florian's files' from class website) for pivot tables and graphics

B) Design 2: Yes/No or other 2 choice answer:

What if you're asking a yes/no question (binary question)?

For entering the scores, just record one of the answers (say, 'yes'), as '1's, and the other as '0's. When you use the average function for such data, you'll automatically get the percentage values (with 1 = 100%).

C) Design 3: More than 2 answers that are not on a scale:

What if you have more than 2 possible responses that are NOT on a scale (e.g., true, false, not sure, different interpretations of a sentence, etc.)

Use Excel's 'COUNTIF' function to calculate percentage for each answer type.

First, sort data points by condition. Then use 'countif' to count how often each answer type occurred per condition:

Answer Type	Conditions	
	a	b
I	=COUNTIF(D2:D25,"I")	
II	COUNTIF(range, criteria)	
III	a	12
	a	b
I	7	6
II	9	6
III	8	12

3 Interpreting results

The main question:

Do the results differ for the different experimental conditions?

Some possible outcomes and what they might mean

Possible Outcome 1: Hypothesis clearly confirmed or clearly false

	Design 1	Design 2	Design 3
Cond. A	4.5	70% yes	I 10% II 20% III 70%
Cond. B	2.0	40% yes	I 70% II 15% III 15%

Confirmed? Great: discuss how data support your idea

Clearly false?: That's OK too. Come up with ideas or arguments for why the results are opposite from what you predicted.

Possible Outcome 2: Murky results!

	Design 1	Design 2	Design 3
Cond. A	3.2	52% yes	I 10% II 20% III 70%
Cond. B	3.1	50% yes	I 15% II 15% III 70%

Can you conclude that there is no difference? NO!!!

Not finding a difference is a **null result** – it does not necessarily mean that there actually is no difference between the conditions!

With a null result, you don't know any more than you did before, except that your study design and the amount of data you have collected are not enough to show that there is a difference.

What to do with this kind of result

It's perfectly acceptable to report an experiment that didn't have clear results in the paper for this class!

Your discussion will have to focus on trying to figure out why your experiment didn't yield clear results in the way you expected. Here are some things you might want to think about:

- Look at subjects and items in more detail.
 - o Do some of them show a more clear effect?
 - If so, how are these different from the ones that don't show an effect?
 - How might this be incorporated into your hypothesis?
- Think about what could have interfered with your effect?
 - o Was there something about the task that could have been confusing?
 - o Did the instructions leave any room for different interpretations?
 - o Is there something else in the materials that varies between examples and which might interfere with the effect you were looking for?

Group Work

Work in small groups (3-4 people)

Main Goal:

Collect questions about entering, analyzing, and interpreting data. Discuss the status of your experiment, and what issues you are running into. You can help each other out with this, of course, but it's also great if you simply collect questions about how to handle your data and results that we can discuss together!

Telling other people about your work can also be very useful for organizing your thoughts before writing them up for the paper.

Make sure to reserve equal time for each person in the group!

Points to cover include (these will vary depending on how far you got)

What is your experimental design?

What type of responses did subjects give in your design?

How did you organize your data?

Do you know how to summarize your data (forming averages, etc.)? If yes, what have you already done or what are you planning to do?

If you already have looked at averages, what are the results? How would you interpret them at this point?