

## Writing the Results Section of Your Thesis



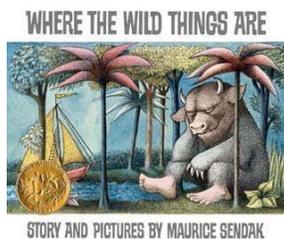
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## Getting started



**“Create and assemble all the figures and tables first. Decide on an order, and then write as if you are creating an illustrated story.”—BD**



**“Outline!”—cme**

## The “results” section is why most\* people are reading your thesis

### They want actual

- observations and measurements, including statistics
- real numbers
- quantitative detail, not qualitative statements

\*Some may be reading it to learn about your methods,  
but most want the numbers

## Include only results in this section

### No description of methods

### No interpretation of what you think the results mean

*“The facts, Ma’am.  
Just the facts.”*



Jack Webb as Joe Friday, “Dragnet”

### No references

## Determine which results are appropriate to present

Include negative as well as positive results

You cannot pick and choose to present only the “good” results

You *can* decide which results are relevant to the goal or hypothesis presented in the introduction section

You must record everything in your laboratory notebook, but your job as an author is to understand your data and present relevant, meaningful results to your readers.

## Advice from Professor DeMarco:

*Synthesize!*

*Don't just write up everything you measured, calculated, analyzed in chronological order.*

*Decide on how the pieces fit together to make a coherent story.*

In other words, no cookbooks!



## Determine the best method to present your data

Figures—photos, schematics, cartoons, visualizations, flow charts

Plots and charts

Tables

Narrative text



## Number figures and tables consecutively in the same sequence they are first mentioned in the text



Figure 1. Artist's conception of the Solar Dynamics Observatory, launched by NASA in 2010 to study the solar corona. Courtesy NASA.

Table II. Systematic error on fluxes.

| Error Source              | CC error, (%) | ES error, (%) |
|---------------------------|---------------|---------------|
| Energy scale              | -5.2, +6.1    | -3.5, +5.4    |
| Energy resolution         | $\pm 0.5$     | $\pm 0.3$     |
| Energy scale nonlinearity | $\pm 0.5$     | $\pm 0.4$     |
| Vertex accuracy           | $\pm 3.1$     | $\pm 3.3$     |
| Vertex resolution         | $\pm 0.7$     | $\pm 0.4$     |

**TIP: Remember figure captions go *beneath* the figure and table titles go *above* the table.**

## Use the past tense to make it clear what you did

The superconducting films **were patterned** by wet etching in a saturated solution of ethylenediaminetetraacetic (EDTA) in water, as well as by an inhibit  $\text{SiO}_x$  structuring process.<sup>10</sup> The  $\text{SiO}_x$  film in this process **was** e-beam **evaporated** through a photoresist mask (AZ 5218). The bond contacts **were made** by evaporating a 300-nm thick Au layer through a photoresist mask. The devices **were contacted** with Al wire by ultrasonic wedge bonding.

## Use the present tense for time-independent facts

All  $\text{YBa}_2\text{Cu}_3\text{O}_x$  devices at 77 K described in the published in literature **show** a remarkable  $1/f$  noise contribution, resulting in an energy resolution of about  $1 \times 10^{-27}$  J/Hz at 1 Hz.

G. Friedl et al., Appl. Phys. Lett. **60**, 3048 (1992).

## Disclose any treatment of data

Cuts and binning

Statistical tests

Signal enhancements

Visual enhancements

Exclusion of outliers

**TIP: If the sample population is large enough, then it's true.** Republican National Committee

## Lay the foundation for your discussion section

**Include all the data that you will use in the interpretations you'll present**

**Think of it as building a case for a jury—in fact, you are!**

**Be specific and quantitative, not general and qualitative**

**Make no editorial statements**

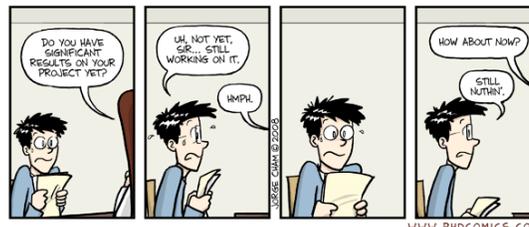
**Be evenhanded and objective**

**Write in a neutral, straightforward tone**

## What if I don't have any results?

**Write about**

- **Details of what you built or are building**
- **Details of how you set up a calculation or a program**
- **Sources of data you are going to analyze and how they were obtained**
- **What results you expect and how you will validate them**



## Some final advice...



***“Lay out your case; present sufficient details so that readers can evaluate your evidence and make their own inferences.”—cme***



***“The biggest pitfall to avoid is barfing everything onto the page in chronological order.”—BD***



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