

## Results Section for Research Papers

### *Parts of a Research Paper*

- Abstract
- Introduction
- Literature Review
- Methodology
- Findings/Results
- Discussion
- Conclusion

The results (or findings) section is one of the most important parts of a research paper, in which an author reports the findings of their study in connection to their research question(s). The results section should not attempt to interpret or analyze the findings, only state the facts. In this handout, you will find a description of a results section, the differences between the results and discussion sections, differences between qualitative and quantitative data, sample results sections, and an activity to explore results in your field.

### What is the Purpose of a Results Section?

The results section summarizes and presents the findings of the study to put them in context with your research question(s). The study's data should be presented in a logical sequence without bias or interpretation. Findings may be reported in written text, tables, graphs, and other illustrations. It is important to include a contextual analysis of the data by tying it back to the research question(s). Only share relevant data and findings that connect with the goal of the study; too much data may overwhelm a reader. An effective results section will present the findings of a study without attempting to analyze or interpret them.

### How Does a Results Section Differ from a Discussion Section?

The results section of a research paper tells the reader *what you found*, while the discussion section tells the reader *what your findings mean*. The results section should present the facts in an academic and unbiased manner, avoiding any attempt at analyzing or interpreting the data. Think of the results section as setting the stage for the discussion section by making all the necessary information known to the reader. It is not uncommon for these sections to be combined, but researchers will often use sub-headings to distinguish between the two. If you want to know more, check our handout on [Discussion Section for Research Papers](#).

### What are the Differences Between Qualitative and Quantitative Data?

**Qualitative research** uses non-numerical, descriptive data, such as language, themes, and ideas that reflect the human experience. Qualitative data must be interpreted before it can be measured, and it is often collected by using interviews, survey questionnaires, or archival research. Many disciplines that fall within the social sciences will use qualitative data. When presenting qualitative results, authors will typically focus on descriptive and interpretive approaches.

**Quantitative research** uses measurable (or quantifiable) numerical data that can be used to observe trends, make predictions, run experiments, and test hypotheses. If the data can be counted, it is quantitative. Most disciplines that fall under STEM (Science, Technology, Engineering, or Medicine) will primarily use quantitative data. When presenting quantitative results, authors will typically focus on numbers-based approaches that involve statistics, calculations, and data measurements.

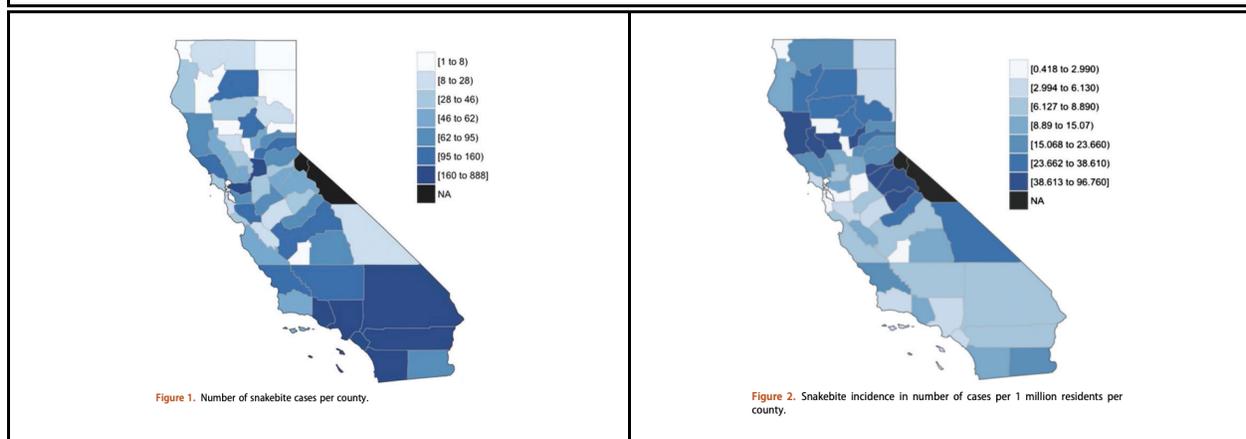
### How Is a Results/Findings Section Structured?

When structuring the results section, it is important that your information is presented in a logical order. There are three basic parts to this section. Sample results/findings sections are provided with annotations later in this handout.

- **First**, begin with an introduction to connect the results with the research question(s). This brings the readers' focus back to the purpose of the study after reading the literature review and methods sections of your paper.
- **Second**, present your findings in a structured way (such as thematically or chronologically), bringing the readers' attention to any *important, interesting, or significant findings*. Be sure to include a combination of *text and visuals*. Data illustrations should not be used to substitute or replace text, but to enhance the narrative of your findings. Take a look at the example below.

### Data Illustration Example

A total of 5365 snakebites were reported to the CPCS from 1 September 1997 through 30 September 2017. All bites were reported from rattlesnakes. The majority of snakebite reports were reported from health care facilities (4607, 85.9%) versus private residences (671, 12.6%), with the distribution of number of cases per county and incidence (number of cases per 1 million residents) shown in Figures 1 and 2.



Source: Phillips et al., "Snakebites and climate change in California, 1997-2017," *Clinical Toxicology*, 2019.

- **Third**, the results section should include a closing paragraph that clearly summarizes the *key findings* of the study. This paves the way for the discussion section of the research paper, wherein the results are interpreted and put in conversation with existing literature.

### Sample of Qualitative Results Section with Annotations

Take a look at this example of a results section from a peer-reviewed journal article, noticing the structure, language, and tone of the author.

**[Introductory Context]** At the end of the data collection, 131 stakeholders participated in the survey. The respondents were distributed by countries as follows: 29 from the Federation of Bosnia and Herzegovina (22.1% of the total), 38 from Croatia (29.0%), 28 from Serbia (21.4%) and 36 from Slovenia (27.5%). [...] **[Important Finding]** The results show that, for most stakeholders, the most important category of WES is regulating services ( $w = 0.3202$ ), followed by provisioning services ( $w = 0.3064$ ) and supporting services ( $w = 0.2209$ ). Cultural services, on the other hand, are of low importance compared to the other three categories ( $w = 0.1524$ ) (Table 1). [...] **[Interesting Finding]** It is also interesting to note that stakeholders from the Federation of Bosnia and Herzegovina and Serbia placed a higher value on cultural services than those from Croatia and Slovenia. For all groups of stakeholders, the consistency ratio (CR) is less than 0.05 (5%). **[Important Finding]** The four most important WES provided by forests are as follows: soil erosion reduction (mean value of 4.65), surface runoff reduction (4.54), clean drinking water provision (4.50) and habitat provision (4.50). Conversely, the two least important ecosystem services according to stakeholders are recreational opportunities (3.92) and maintaining genetic diversity (3.93) (Figure 1). [...] **[Summary of Key Findings]** The results show that there are interesting differences between countries in terms of the level of involvement of different stakeholders. Respondents from Slovenia are the ones who consider a higher level of involvement of all stakeholders in PES schemes as a key element for their success. [...] Respondents from Croatia, Serbia and Slovenia believe that tourism associations should be involved at the level of collaboration (31.6%, 32.1% and 38.9%, respectively), while respondents from the Federation of Bosnia and Herzegovina believe that these associations should only be informed.

Source: White, S., Hannah K., Ambumulire IP., Rochelle H., & Adam B., "A qualitative study of barriers to accessing water, sanitation and hygiene for disabled people in Malawi," *PLOS One*, 2016.

Notice that the findings presented by the author are primarily descriptive and focus on the perceptions of people. The authors are interpreting the commonalities and themes that arose within the study, comparing and contrasting the stakeholders' nationalities and opinions to drive conclusions. By clumping shared opinions, the authors have transformed qualitative data into statistics that can be measured.

### Sample of Quantitative Results Section with Annotations

Next, let's take a look at another example of a results section, also from a peer-reviewed journal article. Pay attention to the differences between this article and the previous one.

**[Introductory Context]** A total of 5365 snakebites were reported to the CPCS from 1 September 1997 through 30 September 2017. All bites were reported from rattlesnakes.

**[Relevant Finding]** The majority of snakebite reports were called from health care facilities (4607, 85.9%) versus private residences (671, 12.6%), with the distribution of number of cases per county and incidence (number of cases per 1 million residents) shown in Figures 1 and 2.

[...] **[Significant Finding (including a significant test result)]** Males were significantly more likely than females to be injured (76.6%, 95% CI  $\frac{1}{4}$  75.6–77.9%,  $p < .01$ ) [...]

**[Reference to Visual Data]** Table 1 describes the demographics, snakebites, call sites, severity, and treatments. [...] Among the 3580 (67%) of reports with detailed treatment data, the most common intervention was FAb antivenom (59%). **[Relevant Finding]** Controlling for population showed that increased population density equated to greater number of snakebites (Supplementary Appendix Figure 1), however, rural areas where snakes natural habitat is more common had a greater incidence of snakebites per capita (Supplementary Appendix Figure 2).

**[Context to Research Question]** Season and trend decomposition were used to explore snakebite incidence over the study duration and interrelated with drought, precipitation, and temperature. It is assumed that high temperatures and low precipitation predispose drought, while the opposite is true for the recovery from drought. **[Explanation of Test]** All three variables were tested independently to determine which indicator provided the best predictive accuracy of incidence and on what time scale. The incidence of snakebite per million people declined during drought (mean in drought  $\frac{1}{4}$  15.10, mean outside drought  $\frac{1}{4}$  18.57, 95% CI difference  $\frac{1}{4}$  0.12–6.83,  $p \frac{1}{4}$  .04). [...]

**[Significant Findings]** Statistically significant correlations were found between both lagged precipitation (i.e., precipitation from previous

months) and snakebite incidence (maximum rho  $\frac{1}{4}$  -0.52, p .01 at 18 months prior) and drought and incidence (maximum rho  $\frac{1}{4}$  0.17, p  $\frac{1}{4}$  .01 at 6 months prior). [...] **[Summary of Key Findings]** Taking each predictive variable in isolation (due to their mutual dependence) and adjusting for seasonal fluctuations, excess snakebite incidence could be calculated directly from the six month prior drought at a rate of -3.8% per  $\frac{1}{10}$  increase in drought, and  $\frac{1}{10}$  3.9% for each 10% increase in 18 month prior precipitation across the state of California (Figure 8) and counties.

Source: Phillips C., Lipman G., Gugelmann H, Doering K., & Lung D., "Snakebites and climate change in California, 1997-2017," *Clinical Toxicology*, 2019.

What are some differences you noticed between the two articles? The first utilized qualitative data, while the second used quantitative data. There were far more calculations presented in the second article, and it was also organized by theme rather than region. Both included statistics reports, and both presented the facts without attempting to interpret their meaning.

### Results/Findings Section Dos and Don'ts

- **Do** write with an academic, impartial, objective tone to increase credibility as a scholar.
- **Do** provide clear topic sentences that connect your findings to your research question.
- **Do** take time to establish key findings in connection to your research question.
- **Do** include any negative findings, as failing to do so would hurt your credibility as a scholar.
- **Do** include statistical significance tests if applicable.
- **Don't** attempt to discuss, interpret or analyze your findings within the results section.
- **Don't** use vague terms or generalizations when presenting your findings, always be specific.
- **Don't** present raw data that can be summarized or presented visually.
- **Don't** present the same data multiple times, but decide on one format to best convey it.
- **Don't** present data that is not relevant to your research question(s).

## Activity: Learn About Results and Findings in Your Field

Navigate to **Google Scholar** or **SJSU ScholarWorks** (<http://scholarworks.sjsu.edu>). To use ScholarWorks, select “*Collections*,” choose a college and department, then click to view “*Master’s Theses and Graduate Research*.” Once there, you can explore the work produced by alumni and peers. Explore titles and read up on topics that interest you, focusing on the results sections of each paper.

Look at examples of research articles from your discipline, paying close attention to how the information is conveyed in the results section. Most often this section will have a heading named results or findings.

How are the results sections structured? How do the authors organize their information? Do they use visual aids effectively? What is the average length of each results section? What structures do you find easiest to read and why? The examples you explore can act as models as you develop your own results section.

Lastly, it is always a good idea to consult author guidelines if you intend to publish your research paper. Some journals or conferences require that the results and discussion sections be combined, so it is important to check before submitting your paper for publication or presentation.

## References

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