

Begin Results Section with a Little Overview

RESULTS

The ratios of dominant to recessive forms were remarkably consistent in each of the first generation offspring of the monohybrid and dyhybrid crosses. The 3:1 ratio (dom:rec) in monohybrid crosses was expressed as a 9:3:3:1 ratio in the dyhybrid crosses. There was no evidence of blending and no evidence of an effect of gender on the outcome of any of the crosses.

Monohybrid crosses

Each of the initial seven monohybrid crosses resulted in plants that exclusively expressed the dominant form of each trait. The recessive form appeared only in later generations. This constituted the definition of dominant and recessive forms.

When the monohybrids were allowed to self-fertilize, dominant and recessive forms were expressed in a ratio of approximately 3:1 for each of seven traits (Table 1) more detail....

Self fertilization among the first generation offspring of the initial monohybrid crosses revealed a pattern among the offspring that reflect heterogeneity among the parent plants.... (this is about the 2:1 ratio of constant dominant to hybrid dominant...

Dyhybrid crosses

GOALS FOR SCIENTIFIC WRITING

Structure

- **Apparent:** Headings, subheadings, and topic sentences are easily identified and reflect your writing strategy.
- **Instructive:** The paper's headings, subheadings, and topic sentences organizes the reader's thinking (can serve as a summary of the content when converted to an outline).
- **Appropriate:** Structural complexity matches the complexity of the content.

Language

- **Concise:** Sentences are succinct, containing no extra words.
- **Precise:** Word choice reflects a thoughtful process.
- **Engaging:** Sentences are written in active voice with strong verbs and apt adjectives.

GOALS FOR SCIENTIFIC WRITING

- **Illustrations**

- **Appropriate:** The choice of tables versus figures suits the data and would not be better expressed as text.
- **Well designed:** Illustrations are readable and attractive.

- **Form**

- **Correct grammar, spelling, and punctuation.**
- **Correct formatting.**

To tighten your writing, eliminate redundancies and writing zeroes

Vibration measurements made in the course of the Titan flight test program were complicated by the presence of intense high-frequency excitation of the vehicle shell structure during the re-entry phase of the flight.



Vibration measurements made in the Titan flight were complicated by intense high-frequency excitation of the vehicle shell during re-entry.

Discussion and Conclusion

The squid technique:

The author is doubtful about his or her facts or reasoning and retreats behind a cloud of ink.

What's the Purpose of a Discussion Section?

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Summarize findings
presented in the results
section.

**Cite supporting
literature.**

Explain discrepancies
between your findings
and previous reports.

Point out **shortcomings** of
your work.

What's the Purpose of a Discussion Section? (continued)

Define unsettled points.

Discuss **theoretical and practical implications** of your work.

End with a short **summary or conclusion** about the work's importance.

See the International Committee of Medical Journal Editors. <http://www.icmje.org/>.

Remember This?

The Introduction and Discussion are like **bookends** around your Methods and Results.

They **integrate** your original findings with the literature and current knowledge.

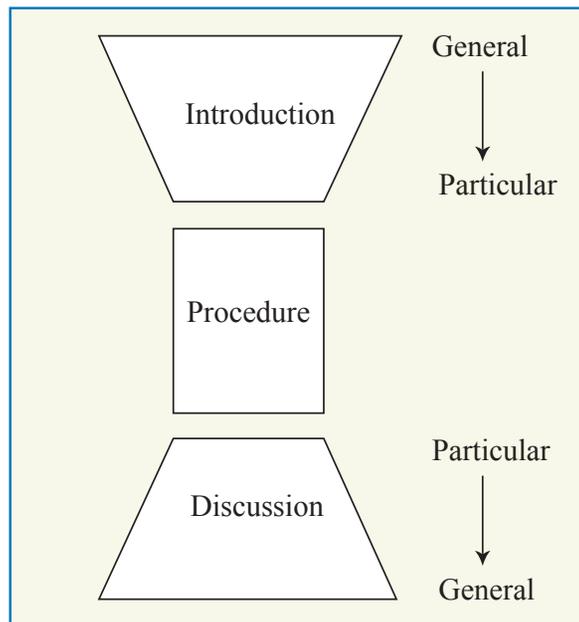
Context, Justification, and Focus

addressed in the Introduction are echoed in the Discussion section:

Focus = Summary of findings

Context = How do findings fit in?

Justification = Implications of your work (and next steps).



Overall Organization of the Research Paper (Hill, et. al., 1982.)

Image by MIT OCW.

Jagannath, Amita. "Colchicine addition disrupts the nuclear localization of the HeT-A Gag protein in transfected *Drosophila melanogaster* Schneider 2 cells." *MIT Biology Undergraduate Journal* 4 (2001): 167-177.

Nagarajan, Srikantan, et al. "Cortical auditory signal processing in poor readers." *Proceedings of the National Academy of Sciences* 96, no. 11 (May 25, 1999): 6483-6488.

Phonologic-Deficit Hypothesis

- People with dyslexia are unaware that:
 - **Words can be broken down into smaller units of sound (phonemes).**
 - That letters constituting the printed word represent the sounds heard in the spoken word.
- Higher levels of language system: semantics, syntax, discourse.
- Lower levels of language system: **phonologic module for processing distinctive sound elements that constitute language.**

What Makes a Discussion Section Tough to Write?

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The discussion section is **harder to define** than other sections of a research paper.

It requires **perspective, knowledge, and thought.**

You may have begun **writing before the conclusions were formulated.**

Your data may be weak or **inconclusive**

What are the Pitfalls of a Discussion Section?

Long, wordy arguments that **lack of focus** and meander.

Failure to follow through with arguments begun in the introduction.

Failure to **focus on current results**.

Speculating too much or not enough.

Improper tense - Discussions are written in the present tense.

Hedging excessively.

Excessive Hedging

Matthews, Janice R., et al. *Successful Scientific Writing Full Canadian Binding: A Step-by-Step Guide for the Biological and Medical Sciences*. Cambridge, UK: Cambridge University, 2000. ISBN: 0521789621.

“The cause of the degenerative changes is unknown but *possibly* one cause *may* be infection by a *presumed* parasite.”

Rule of thumb: One hedge word per sentence!

Common Hedging Words

Matthews, Janice R., et al. *Successful Scientific Writing Full Canadian Binding: A Step-by-Step Guide for the BioloPressgical andMedical Sciences*. Cambridge, UK: Cambridge University, 2000. ISBN: 0521789621.

nouns	adverbs	verbs
supposition	presumably	appear
idea	probably	postulate
speculation	possibly	suggest
conjecture	apparently	seem
possibility	not unlikely	may be
inference	seemingly	speculate

In-class Exercise:

Review the illustrations and results of the student who's name appears two below yours on the roster.

Out-of Class Exercises

Write a critique of the Discussion section of the NEJM paper by Druker et al.

(You wrote plain language introductions for this paper at the beginning of the term.)

Read the Birth of Molecular Biology - posted on the 7.02 web site.

Continue with long-term project:

Write discussion and conclusions

Make revisions to prior sections as needed.