

Paper structure(s)

Observables upon a Monstrous Head.

This was the Head of a *Colt*, represented in the annexed *Figure 4.* first viewed by Mr. *Boyle*, who went into the Stable where the *Colt* lay, and got the Head hastily and rudely cut off, the *Body* thereof appearing to his Eye compleatly formed, without any *Monstrosity* to be taken notice of in it. Afterwards he caused it to be put into a Vessel, and covered with *Spirit of Wine*, thereby chiefly intending, to give good example, together with a proof, that by the help of the said *Spirit*, (which he hath recommended for such Properties in one of his *Essays* of the *Usefulness* of *Natural Philosophy*) the parts of *Animals*, and even *Monsters*, may in *Summer* it self be preserved long enough, to afford *Anatomists* the opportunities of examining them.

The Head being opened, and examined, it was found,

First, That it had no sign of any *Nose* in the usual place, nor had it any, in any other place of the Head, unless the double Bagg CC, that grew out of the midst of the forehead, were some rudiment of it.

Next, That the *two Eyes* were united into one *Double Eye*, which was placed just in the middle of the Brow, the *Nose* be-

Papers (now)
have (mostly)
standardized
structure

Sidebar on the Golden Fleece Award

- Created by Senator Proxmire in 1975
- Given to public officials for wasteful spending
- Scientific example:
 - The NSF for spending \$103,000 to compare aggressiveness in sun fish that drink tequila as opposed to gin

Sidebar on the Ig Nobel Prize

- Created by Mark Nichols in 1991
- To “honor achievements that first make people laugh, and then make them think”
- Examples:
 - The discovery that the presence of humans tends to sexually arouse ostiches
 - Black holes fulfill all the technical requirements for being the location of Hell.
 - Levitating a frog by magnetism



IMRaD structure

IMRaD (or AIMRaD) is now standard for ~90% of all papers.

(Abstract)

Introduction

Methods

Results

and

Discussion

Why? Eases the job of reviewers, editors, **and readers.**

IMRaD in more detail

Front Matter
Title
Byline and author affiliations
Keywords, word counts, and other details

Abstract

Introduction

General context of the work
Narrower research area and statement of its importance
Identification of a gap or other need for research
Specific research question meeting the identified need
Summary of approach to answer the research question
Announcement of principal findings

Methods

Materials, species, field sites, mathematical techniques, etc. used in the research
Observational/experimental procedures followed
Methods for analysis of data

Results

Results of observations, experiments, or modeling in text, tables, and/or figures
Comparisons among results (e.g., observation vs. theory or treatment vs. control)

Discussion

Interpretation of results to answer research questions
Consideration of possible weaknesses
Relationship of results to previous literature and broader implications of having answered research question
Prospects for future progress

Back Matter

Acknowledgements

References cited

Appendices or online supplements

Data archives

Breadth of discussion

Notice:

- extra elements before/after IMRaD
- structure within each section
- hourglass structure (breadth of focus)
- value as a “finding system”

Non-canonical structures

1) Methods-last

- Common in “glam journals”

2) “Results and Discussion”

- An *apparently* minor deviation
- Easier to write – but often harder to read
- Can work well for theory papers
- Can work well for papers with building complex stories with multiple lines of evidence

Non-canonical structures (continued)

3) Review papers

- Usually don't have methods/results (except meta-analyses)
- Many organizational systems
 - temporal
 - methodological
 - thematic
- Outlining is especially important when writing reviews

4) Notes

- Very short papers often published as “notes”
- IMRaD and other headings often prohibited
- IMRaD structure can/should still be there

Non-canonical structures (continued)

5) Comments

- Critique or rebut previously-published papers
- Little Introduction; no Methods; no Results
- Essentially alternatives/supplements to original paper's Discussion

6) Theses

- Kind of deserve their own slide

Non-canonical structures (continued)

6) Theses

- Three functions
 - communicating science
 - establishing credentials
 - archiving unpublished material
- Two common formats
 - “papers format”
 - General Introduction – paper – paper – paper – General Discussion
 - each readable independently
 - papers intended for broad reading via publication
 - “thesis format”
 - Single long argument, even if divided into chapters
 - Usually longer, more detailed
 - Not intended for reading outside examining committee

Today's workshop

Finding IMRaD

- Take your Science/Nature non-IMRaD papers
- Use colour-coded Highlighters to mark text serving functions of Introduction, Methods, Results, and Discussion
- What are the advantages and disadvantages of IMRaD and non-IMRaD?