Typical structure of a scientific paper

(IMRAD structure)

- Title
- Abstract
- Introduction (What did you study? Why did you study this?)
- Materials and Methods (How did you do?)
- Results (What did you find?)
- Discussion (What does it mean?)
- Acknowledgements
- References
A bad beginning makes a bad ending.

— Euripides
The order of ideas in research paper normally follows the pattern G-S-G
The introduction usually has from **four to six** stages (moves) moving from the general to the more specific:

**General**

Order of Ideas

**Specific**

1st stage: ?
2nd stage: ?
3rd stage: ?
4th stage: ?
5th stage: ?
6th stage: ?
The introduction usually has from four to six stages (moves) moving from the general to the more specific:

1\text{st} \text{ stage: establishing a context}
Useful expressions: 

1st stage 
establishing a context

- Injury is the main cause of death in people under fifty years old.
- The cell population types constituting multicellular organisms can be roughly classified, based on their kinetics, into three main groups: ....
- Paleoecology shows that vegetation has continually changed with climate.
- Clean water is a basic human need.
- During the past forty years, computers have become essential tools in many walks of life.
Some “skeletal” examples

- Recently, there has been growing interest in ...
- The possibility of ... has generated wide interest in ...
- The development of ... is a classic problem in ...
- The development of ... has led to the hope that ...
- The ... has become a favorite topic for analysis ...
- Knowledge of ... has a great importance for ...
- The study of ... has become an important aspect of ...
- A central issue in ... is ...
- The ... has been extensively studied in recent years
- Many investigators have recently turned to ...
- The relationship between ... has been investigated by many researchers.
- Many recent studies have focused on ...
The introduction usually has from **four** to **six** stages (moves) moving from the general to the more specific:

- **1st stage:** establishing a context
- **2nd stage:** reviewing the literature
Tense patterns in reporting

1. **Past** – single study and researcher as agent – *Jones (1998) investigated the causes of bark beetle outbreaks*

2. **Present perfect** – area of inquiry – *There have been several investigations into the causes of bark beetle outbreaks (Brie 1966, Jones 1998)*

3. **Present** – reference to current knowledge (but not direct reference to research activity) – *The causes of bark beetle outbreaks appear to be complex (Brie 1966, Jones 1998)*
What is the difference?

- Smith (1993) found that the number of fires was correlated most closely with ....

- Smith (1993) found that the number of fires is correlated most closely with ....
Citational Present

- Plato argues that ... 
- Confucius says ... 
- The Bibles says ... 
- The constitution states ...
3rd Stage: establishing a gap

Here you signal to the reader that literature review is finished. Your review should point a gap in the literature, i.e. an important research area not investigated by other authors because:

- They overlooked or ignored this area, or
- There is conflict about the area, or
- Your area is a kind of extension or continuation of other research
The introduction usually has from **four** to **six** stages (moves) moving from the general to the more specific:

- **1st stage:** establishing a context
- **2nd stage:** reviewing the literature
- **3rd stage:** establishing a research gap
Some “negative” verbs:

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
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<tbody>
<tr>
<td>1</td>
<td>concentrated on ...</td>
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<tr>
<td>2</td>
<td>disregarded ...</td>
</tr>
<tr>
<td>3</td>
<td>failed to consider ...</td>
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<tr>
<td>4</td>
<td>ignored ...</td>
</tr>
<tr>
<td>5</td>
<td>been limited to ...</td>
</tr>
<tr>
<td>6</td>
<td>misinterpreted ...</td>
</tr>
<tr>
<td>7</td>
<td>neglected to consider ...</td>
</tr>
<tr>
<td>8</td>
<td>overestimated ...</td>
</tr>
<tr>
<td>9</td>
<td>overlooked ...</td>
</tr>
<tr>
<td>10</td>
<td>been restricted to ...</td>
</tr>
<tr>
<td>11</td>
<td>suffered from ...</td>
</tr>
<tr>
<td>12</td>
<td>underestimated</td>
</tr>
</tbody>
</table>
Some “negative” adjectives:

“Nevertheless, these attempts to establish a link between secondary smoke and lung cancer are at present …

- controversial
- incomplete
- inconclusive
- misguided
- unconvincing
- questionable
- unsatisfactory
Note the use of no/none of

- **No** studies/data/calculations ...
- **None of these** studies/findings/calculations
What is the difference in the following pairs of sentences?

- He has little research experience/ He has a little research experience

- The department has few computers/ The department has a few computers
Negative openings
However, ...

- little ... ?
- few ... ?

information, attention, researcher, research, data, attempt, work, study, investigation
The introduction usually has from four to six stages moving from the general to the more specific:

**General**

1\(^{st}\) stage: establishing a context
2\(^{nd}\) stage: reviewing the literature
3\(^{rd}\) stage: establishing a research gap
4\(^{th}\) stage: stating the purpose

**Specific**
1. The aim of the present paper is to give ...
2. This paper reports on the results obtained ...
3. In this paper we give preliminary results for ..
4. The main purpose of the experiment reported here was to ...
5. This study was designed to evaluate ...
6. The present work extends the use of the last model by ...
7. We now report the interaction between ...
8. The primary focus of this paper ...
9. The aim of this investigation was to test ...
10. It is the purpose of the present paper to provide ...
Remarks

- Note: *uses of this, the present, here*
- Switch from the impersonal to the personal by using *we* or *I*
- “We present the results of three experiments in this paper” or “In this paper we present the results of three experiments” ?????
Tense in Purpose Statements

- Present or Past (was or is) ???

- It depends on how you refer to your work:
  - if you work is the text then you must use present tense because when you write, “The aim of the paper was to ...,”
  - if you work is the investigation then you either was or is, and there is a tendency to use is
This paper explores the question of how browsing affects the regeneration of...

The aim of the present study was to determine whether... and to observe the response of...

This study attempts to give a partial answer to question posed in the introduction: does vegetation grow differently under artificial snow?

In this paper we report on the results of survey conducted to determine the...

A thorough review of the research and theory related to this phenomenon is obviously beyond the scope of this study