What types of information should you include in your introduction?

In the introduction of your thesis, you’ll be trying to do three main things, which are called *Moves*:

- **Move 1** establish your territory (say what the topic is about)
- **Move 2** establish a niche (show why there needs to be further research on your topic)
- **Move 3** introduce the current research (make hypotheses; state the research questions)

Each *Move* has a number of stages. Depending on what you need to say in your introduction, you might use one or more stages. Table 1 provides you with a list of the most commonly occurring stages of introductions in Honours theses (colour-coded to show the *Moves*). You will also find examples of Introductions, divided into stages with sample sentence extracts. Once you’ve looked at Examples 1 and 2, try the exercise that follows.

Most thesis introductions include SOME (but not all) of the stages listed below. There are variations between different Schools and between different theses, depending on the purpose of the thesis.

### Stages in a thesis introduction

1. state the general topic and give some background
2. provide a review of the literature related to the topic
3. define the terms and scope of the topic
4. outline the current situation
5. evaluate the current situation (advantages/ disadvantages) and identify the gap
6. identify the importance of the proposed research
7. state the research problem/ questions
8. state the research aims and/or research objectives
9. state the hypotheses
10. outline the order of information in the thesis
11. outline the methodology

### Reflection

Now read the following two examples from past theses, noting which stages are included in each example. How does example 1 differ from example 2?

**Example 1: Evaluation of Boron Solid Source Diffusion for High-Efficiency Silicon Solar Cells (School of Photovoltaic and Renewable Energy Engineering)**

<table>
<thead>
<tr>
<th>Stage</th>
<th>Sample sentence extracts (complete introduction is 4 pages)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Give background about the topic</td>
<td>P-type layers are commonly used in solar cells as they offer a wide range of applications such as a back surface field...</td>
</tr>
</tbody>
</table>
### Example 2: Methods for Measuring Hepatitis C Viral Complexity (School of Biotechnology and Biological Sciences)

Note: this introduction includes the literature review.

<table>
<thead>
<tr>
<th>Stage</th>
<th>Sample sentence extracts (complete introduction is 11 pages)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. State the general topic</td>
<td>...The hepatitis C virus (HCV) is a significant human pathogen given that 3% of the world’s population are infected with the virus…</td>
</tr>
<tr>
<td>1. (2) Give some background about the topic</td>
<td>...The HCV genome is a positive sense, single stranded RNA molecule with an approximate length of 9.5kb…</td>
</tr>
<tr>
<td>3. (2) Define the terms and scope of the topic</td>
<td>...Quasispecies are defined as a population of closely related minor genetic variants and are a noted phenomenon of plant and RNA viruses…It has been widely recognised that treatment outcome is highly dependent on the complexity…</td>
</tr>
<tr>
<td>5. (2) Evaluate current situation</td>
<td>...Cloning and sequencing is considered a time-consuming and laborious method and as such there exists a need for the development of simple alternative methods…</td>
</tr>
<tr>
<td>5. (2) Identify the gap in current research</td>
<td>...At present there is no suitable method that has produced results comparable to that of cloning and sequencing which also has the additional properties of simplicity and rapidity…</td>
</tr>
</tbody>
</table>
6. Identify importance of proposed research

There is mounting evidence, however, that immediate treatment will result in successful eradication of HCV. Therefore studies of acute phase quasispecies will enhance the understanding of the early virological events of newly acquired HCV infection and ultimately the disease process itself.

9. State the hypothesis

The hypotheses for this study are that there exist suitable parameters to assess quasispecies complexity. Furthermore, a rapid and simpler alternative method to cloning and sequencing can be developed to accurately describe the complexity of a given quasispecies population.

8. State research aims

1. Define a set of parameters to analyse quasispecies complexity.
2. Develop a simpler and rapid alternative to cloning and sequencing that would accurately assess complexity of quasispecies populations.

Now that you have read example 1 and 2, what are the differences?

See Answer

Exercise

Read the following sample sentence extracts from Honours theses Introductions. When you have decided what stage of the Introduction they belong to, refer to the stages in a thesis introduction and give each sentence extract a number. Then check the suggested answer to see if your answer agrees with ours.

Example 3: The IMO Severe-Weather Criterion Applied to High-Speed Monohulls (School of Mechanical and Manufacturing Engineering)

<table>
<thead>
<tr>
<th>Sample sentence extracts (complete introduction is 6 pages)</th>
<th>Stage No:</th>
</tr>
</thead>
<tbody>
<tr>
<td>...The IMO Severe Wind and Rolling (Severe-Weather) Criterion is a stability criterion that has been developed to assess the dynamic stability of a vessel…</td>
<td></td>
</tr>
<tr>
<td>The theory behind the Severe-Weather Criterion is sound, and has a lot of merit. However, many of the new generation of high-speed monohulls are having trouble passing the criterion…</td>
<td></td>
</tr>
<tr>
<td>...As a result, it is believed that the formula used to predict the windward roll angle ?1 is flawed and over-predicts the rolling amplitude for high-speed monohulls…</td>
<td></td>
</tr>
<tr>
<td>...Thus it is desired to evaluate the actual rolling amplitude that these vessels will experience…</td>
<td></td>
</tr>
<tr>
<td>In order to evaluate how the Severe-Weather Criterion is applied to high-speed monohulls, two vessels have been used as a case study…</td>
<td></td>
</tr>
</tbody>
</table>
Example 4: The Steiner Tree Problem (School of Computer Science and Engineering)

The Steiner Minimal Tree (SMT) problem is about finding the minimum connecting network for a set of points. Its minimal property implies that the network must be a tree…

Formally, the problem can be stated as follows: given N points in the Euclidean plane, find the minimum spanning tree that covers these N points. Additional points besides these N points can be added to the tree as extra vertices…

The SMT is a very interesting problem both in theoretical computer science and many practical applications. Like other graph problems, it is fundamental to solving many common problems, such as communication network planning and VLSI circuit design. The following are some examples…

This section describes the contents of the rest of the thesis…Section 2 provides a literature survey on Steiner trees, including a number of exact and heuristic algorithms developed…

Introduction exercise

Note: this introduction includes the literature review.

Example 5.1 (extract 1): The effects of Fluoride on the reproduction of three native Australian plant Species (School of Geography)

Stage 1

Give some background (p.1 of 17)

1.1 Fluoride in the environment

Molecular fluorine (F2) is the most electronegative of the elements and therefore is highly reactive. Due to its high reactivity it is never found in its elemental form in nature. It combines directly at both ordinary or elevated temperatures with all other elements except oxygen, nitrogen, and the lighter noble gases (Cotton & Wilkinson, 1980).

Example 5.2 (extract 2): The effects of Fluoride on the reproduction of three native Australian plant Species (School of Geography)

Stage 2

Provide a review of the literature related to the topic (p.2 of 17)

The main source of elevated fluoride in plants comes from atmospheric industrial pollution. Because of its extensive industrial use, hydrogen fluoride is probably the greatest single atmospheric fluoride contaminant and is generally considered to be the most important plant pathogenic fluoride (WHO, 1984; Treshow, 1965)… However, fluorides can cause damage to sensitive plant species even at extremely low fluoride concentrations(Hill,1969), accumulate in large amounts within the plant and cause disease if ingested by herbivores(Weinstein, 1977).

Example 5.3
### Stages 4 and 5

<table>
<thead>
<tr>
<th>Stages 4 and 5</th>
<th>Sample sentence extracts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Outline the current situation; Evaluate the current situation and indicate a gap (p.12 of 17)</td>
<td>Doley (1981) summarized several unpublished studies that compared the sensitivity rankings of 24 species according to the responses of photosynthesis and the development of visible injury symptoms. This analysis showed that for nine species, photosynthesis measurements indicated greater sensitivity than was obvious from visible assessment, and for seven species the converse applied. This indicated that, while it may generally be true that physiological responses occur at lower doses than visible injury, this does not always appear to be the case.</td>
</tr>
</tbody>
</table>

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**Exercise:**

**What Stages can you identify in this extract?**

<table>
<thead>
<tr>
<th>Stage No:</th>
<th>See Answers</th>
</tr>
</thead>
<tbody>
<tr>
<td>…This is consistent with the findings of Weinstein (1977) that the extent of foliar damage is not always correlated with the level of accumulated fluoride. Studies in Western Australia (Horne et al., 1981) have reported field injury to vines situated near to brickworks in the Swan Valley and concluded that fluoride pollution can seriously affect grapevines.</td>
<td>???</td>
</tr>
</tbody>
</table>

Thus classification of cultivars according to levels of sensitivity to airborne fluorides is considered necessary for two reasons- a)knowledge of a resistant cultivar would be of important commercial interest to the vigneron, and b) the possibility of discovering a highly sensitive cultivar to provide an indicator plant to be used to warn growers when ambient conditions were approaching threshold levels(Greenhalge & Brown, 1984). | ??? |

### Example 5.4 (extract 4): The effects of Fluoride on the reproduction of three native Australian plant Species (School of Geography)

<table>
<thead>
<tr>
<th>Stage 7</th>
<th>Sample sentence extracts</th>
</tr>
</thead>
<tbody>
<tr>
<td>State the research problem (p.4 of 17)</td>
<td>In many Australian plant species, young expanding leaves appear much more severely injured by gaseous fluorides than are old leaves. This suggests, either that the young leaf tissues are more sensitive to fluoride than mature tissues, or that sufficient fluoride enters the tissues directly through the cuticle to disrupt normal leaf development before the stomata have fully developed and opened(Doley, 1986a). This question has not been resolved due to the inability to accurately localize low concentrations of fluoride(Doley, 1986a)</td>
</tr>
</tbody>
</table>

**Exercise:**

### Example 5.5 (extract 5): The effects of Fluoride on the reproduction of three native Australian plant Species (School of Geography)

<table>
<thead>
<tr>
<th>Stage 8</th>
<th>Sample sentence extracts</th>
</tr>
</thead>
<tbody>
<tr>
<td>State the research aims and /or research objectives (extract p.16 of 17)</td>
<td>Knowledge of the effects of fluoride on the reproductive processes of species within a forest community will help predict potential changes within the community following an increase in atmospheric fluoride due to additional industrial sources, such as aluminium smelters. For these reasons, this project was designed to investigate the reproductive processes of selected species in a woodland near the aluminium smelter at Tomago.</td>
</tr>
</tbody>
</table>

**Exercise:**
This study investigates the effects of ten years of increased atmospheric fluoride from Tomago Aluminium Smelter, New South Wales on the reproductive processes of three selected native species, Banksia aemula, Bossiaea heterophylla and Actinotus helianthi... The study aims to determine the effects of the fluoride emissions on the reproductive processes of the selected species by analyzing the differences between several of their reproductive and associated characteristics found along a fluoride gradient.

Example 5.6 (extract 6): The effects of Fluoride on the reproduction of three native Australian plant Species (School of Geography)

Stage 11 | Sample sentence extracts
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State the outline of the Methodology (extract p.17 of 17). | Germination trials were performed on seeds collected from each species along the fluoride gradient to determine if fluoride has an effect on their viability and hence the regeneration fitness of each species. A density study was used to determine if there were any differences between numbers of mature and immature trees, number of trees producing seed follicles and the number of trees flowering in this season along a fluoride gradient. By using soils collected at various distances away from the smelter the study also investigated differences in germination from the natural soil seed reserve along a fluoride gradient.

Reflection

What does this tell you about thesis introductions?

Well, firstly, there are many choices that you can make. You will notice that there are variations not only between the different Schools in your faculty, but also between individual theses, depending on the type of information that is being communicated. However, there are a few elements that a good Introduction should include, at the very minimum:

- Either Statement of general topic Or Background information about the topic;
- Either Identification of disadvantages of current situation Or Identification of the gap in current research;
- Identification of importance of proposed research
- Either Statement of aims Or Statement of objectives
- An Outline of the order of information in the thesis