

HANDBOOK WRITING SKILLS

ON STYLE, STRUCTURE AND CONTENT

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A concise introduction to this writing manual

This document involves the academic writing skills that students will practice throughout the period of their bachelor's and their master's degrees. The text comprises three parts. The first part describes a number of **writing principles** and guidelines. The principles focus on how to present the content of any text and help the reader to understand what the writer intends to communicate. These principles pertain to all writing and thus include scientific writing, which will be detailed in the two latter parts of this handbook.

The second part of this handbook deals with the contents and structure of a **scientific review paper** and will help students to write the **second year's scientific opinion paper**. But it may also be helpful to write the **third year's bachelor thesis**, whereby students choose the scientific review paper format to complete their bachelor period.

The third part of this manual captures the structure and contents of the **empirical research paper**. This information should prove helpful in the completion of a number of writing assignments in the psychology curriculum. Examples are the report written as part of the **second year's research practical**, and the **bachelor thesis** in the third year when a student decides to report on a self-conducted empirical study to complete the bachelor program. These skills are also necessary to plan and write the **master thesis**.

In *The Elements of Style*, the brilliant American humourist and writer E. B. White (author of *Stuart Little* and *Charlotte's Web*) quotes his mentor William Strunk:

“Vigorous writing is concise. A sentence should contain no unnecessary words, a paragraph no unnecessary sentences, for the same reason that a drawing should have no unnecessary lines and a machine no unnecessary parts. This requires not that the writer make all sentences short or avoid all detail and treat subjects only in outline, but that every word tell.”

Some principles of how to write a paper

Summary

Effective writing is explained via the so-called storyline approach. Writers create a storyline that runs through the entire paper and writers ensure that the reader keeps track of that story line. Successful writers accomplish this by attending to the proper wording, but also by structuring sentences, paragraphs and sections. Sentences must be written clearly and successive sentences should be strung together. These sentences are then called cohesive. A writer creates cohesion by starting a sentence with what a reader knows and ending a sentence with new information. A writer should also create a coherent text. To make that happen, paragraphs need to be connected and each paragraph starts with one or more introductory sentences, also known as the issue. This issue is then discussed during the remainder of the paragraph. A serious writer should thus apply general style guides to all levels of a text namely, words and phrases, sentences, paragraphs and sections.

This section of the handbook provides principles that may be useful to write any type of text. These principles are explained via a (loose) psychological approach of how to match a writer's communication intentions with what readers may expect and need.

Writing principles mostly work, but are not written in stone.

Writing is for someone

Writers of any text should be aware of the intended reader audience. And it is equally important for a writer not to overestimate the prior knowledge of this audience. Readers often know less about a topic than writers may think, and writers should even assume that readers have to be helped in comprehending a text. It is therefore good advice to ensure that the reader has easy access to all contents that a paper (read: writer) attempts to convey. It is no surprise that graders of papers particularly expect the content of a paper to be easily consumed and interesting to read.

Kurt Vonnegut (1922-2007):

"If you scribble your thoughts any which way, your readers will surely feel that you care nothing about them. They will mark you down as an egomaniac or a chowder head, or worse, they will stop reading you."

What readers want: The storyline notion

From a loose psychological viewpoint, any writer should attempt to communicate a story and create a storyline that runs through the entire text. A storyline may be viewed as similar to a schema (Bartlett, 1932) or a situation model (Kintsch, 1988) that develops as the text unfolds. The writer should attempt to make sure that the reader remains on the storyline from the beginning to the very end of the paper.

A reader is helped to keep track of the storyline when the writer's good writing style radiates throughout the text. This means that words form comprehensive sentences. These sentences need to be strung together into a paragraph that helps the reading flow through the text from one topic to the next. This flow is further facilitated when successive paragraphs are connected.

In short, an uninhibited storyline makes for a coherent and readable text as it facilitates the flow of reading and helps to gradually expand the reader's knowledge. A serious writer may apply a number of writing principles to create such an

unhampered storyline. These principles need to pertain to all the levels in a text, namely words, sentences, paragraphs and sections.

Wording

The reading flow remains active when sentences are built by words that the reader understands and when the meaning of these words easily integrates into the storyline. The writer should help the reader to integrate a new concept into storyline. This is done by properly introducing and explaining any new concept. A number of writing style recommendations regarding text wording may help to improve the reading flow:

- Be sparing in using foreign phrases, scientific or jargon words. It is better to use an everyday English equivalent.
- Some scientific writers think that learned writing implies that a sentence needs to be crammed with scientific words. These writers often produce incomprehensible scientific babble (psycho-babble) and they forgo their readers' needs.
- Related to the former problem are so-called nominalizations, which are nouns that actually should be verbs or adjectives (see example and video on the right). The use of nominalizations can be minimized by turning these nouns into active verbs and make sentences more readable.
- A writer should never use a long word or phrase where a short one will do. For example: *Self-administration of psychotropic substances* = *drug use*. If it is possible to cut a word out, always cut it out.
- Be aware of your choice in using the passive or active tense. Compare:

It was investigated whether...(passive)
We investigated whether... (active)

Preferring the active tense may clash with the idea of avoiding personal language. But a writer may also pretend that a paper or study is a person: "This paper introduces..." or "This study focuses on ...".
- Some sentences are difficult to understand simply because they have many adjectives. Serious pruning of such a sentence is recommended (see example on the right). In fact, writing a text often resembles weeding a garden and a serious writer needs to become used to cut out everything that hampers a clear understanding of a text.

The reading flow hampers when the reader encounters an unexpected word that does not fit in the semantic context of the storyline. The flow hampers, because the reader will attempt to actively integrate the new concept.

You may want to view a short video that is a **persuasion** of the **minimization** of the **production of nominalizations**. In other words: writers should minimize the use of these *zombie nouns*.

<https://www.youtube.com/watch?v=dNikHtMgcPQ#t=59>

The sentence:

The black volatile female dog bit the big angry red male cat.

could be pruned to:

The dog bit the cat.

Improve text concision:

Serious writers should not hesitate to prune or weed out unnecessary parts from their texts.

According to the famous Dutch novelist Godfried Bomans (1913-1971), writing is deleting ("*Schrijven is schrappen*").

Writing style guides are often ambiguous:

- Writing style guides often proclaim that sentences need to be short. It is true that a short sentence is mostly easier comprehended than a longer one. However, variation of sentence length is recommended in a text, as the repetition of many short sentences may also hinder the reading flow (staccato).
- Grammar school teachers often punish pupils who start a sentence with “because”, “and” or “but”. But there is no grammatical reason to forbid this and its usage often improves the reading flow (Williams, 1995).

A far better advice than holding on to stubborn and outdated school teacher logic is to focus on text readability and reading flow. In addition to proper word use, reading flow is also enhanced by improving the structure of sentences as is shown in the next section.

Sentence structure and cohesion: Ordering old and new knowledge

The reading flow is certainly facilitated by a well-structured sentence. Such a sentence helps the reader to read and comprehend the text with minimal effort and is said to be **cohesive**. The writer accomplishes cohesion by starting sentences with what the reader already knows, while new knowledge appears during the remainder of each sentence (Williams, 1995). In this way, a string of sentences is said to be connected and cohesive and helps to form a semantic unit. These sentences are a first start to build a coherent text, as they help readers to remain on the storyline, and gradually expand their knowledge.

To create cohesion by structuring each sentence from old to new knowledge, writers often apply a transition word or phrase to make a concise connection with what the reader already knows. Such a transition acts as a signpost in a text and may express a **conclusion** (e.g., adverbs (*Unfortunately*, ...*Similarly*, ...*Certainly*, ...*Clearly*, ...), or a **contrast** (between sentences: *By contrast*, ...*On the other hand*, ...*However*, ...*Despite*), or leads the reader along a **series** (*First*, ... *Second*, ... *Third*, ...; *In addition* ...*Additionally* ...*Then*...; *Last*, ... *Finally*, ... *Also*, ...; *Further*, ...*Moreover*, ... *Another*...). A transition may also signal an **implication** (*Therefore*, ...; *It follows that* ...; *In conclusion*, ...; *If* ...*then*. Note that signalling implications such as *thus* and *hence* are mostly used within a sentence.

Additionally, cohesive English sentences know a strict grammatical order of certain elements. For example: “The researchers sent their manuscript to the journal.” consists of four important elements:



Some texts are a difficult read and feel slow, stilted and dense. A writer may want to test such a problematic text on cohesion, and check whether its sentence structure actually applies the order from old to new. A text with sentences that start with something new and end with what is known, tends to become semantically disconnected. A longer series of these sentences is often difficult to read, because the reader has to struggle to keep the storyline alive by attempting to actively connect the meanings of these *ill-structured* successive sentences. Mostly, rewriting is the only option. An accomplished writer will attempt to create cohesion and coherence from the start.

1. subject (*the researchers*)
2. verb (*sent*)
3. direct object (*their manuscript*)
4. indirect object (*the journal*)

A sentence mostly reads better when these four elements remain as close to each other as possible. Unlike in some other languages, English verbs are often positioned relatively early in readable sentences. Placing a verb late in a sentence mostly hinders the reading flow as the verb is then too far away from the other three elements. See [appendix 1](#) for examples of ‘bad’ sentences and potential solutions.

Paragraph structure and coherence

Any writer should know that paragraphs are not islands of knowledge that have no apparent relationship with the rest of the text. Instead, a text with connected paragraphs is often perceived as coherent and semantically meaningful. In other words, such a text helps the reader to keep the storyline intact across intentionally connected paragraphs. To make that happen, paragraphs need a certain structure.

The start of any paragraph is meant to keep the reader right on the story line. This means that the writer needs to mention the paragraph's main **issue** in connection to the reader's knowledge of the storyline so far. The main issue is an introduction of new main topics and themes, which according to some style guides is no longer than the first sentence of a paragraph. However, many paragraphs require more than one sentence to introduce the new issue. The issue is then discussed during the remainder of the paragraph.

A paragraph becomes additionally effective when there is an **emphasis of a main point**. Frequently the point completes the paragraph's issue, but in some cases effective paper writers position the point at the end of a paragraph. Irrelevant of the point's position, the discussion of the issue mostly dictates the length of the paragraph as it may contain arguments, justifications and explanations to stress the relevance of the issue. Coherence is definitely created when terms and concepts introduced during the issue, return during the discussion.

Making a final point in initial paragraphs. Every scientific paper starts with one or two paragraphs to inform the reader about a main scientific problem. A reader then expects to know early how this problem is dealt with in the paper. Experienced writers provide such information at the end of the

Williams (1995) argues that most paragraphs introduce a new issue, which is then discussed during the remainder of the paragraph. An effective paragraph emphasizes a so-called **point**, which may be a word, phrase, or sentence. The point helps the reader to stay on the storyline. The point is often located at the end of the issue, but is in some cases found at the end of the entire paragraph.

Length of the introduction (issue) of a paragraph

Below is an example of a paragraph issue with more than one sentence and with the position of the main point in the second sentence. This illustrates that high school teachers may be wrong about what an effective paragraph structure is (Williams, 1995, p. 102):

“Most high school teachers think that good paragraphs must have a single topic sentence that introduces the paragraph. But that is evidently not so because professional writers regularly introduce their paragraphs with two or more sentences.”

first or second paragraph. Such a paragraph therefore starts with an issue and its discussion, but ends differently than is common for most paragraphs (Williams, 1995). The writer often makes the **point** at the end of a starting paragraph to create a firm anchor for the storyline. In scientific writing such a point often describes in general terms the study topic that will be focused on.

To postpone the point until later paragraphs means that readers have to hold their breaths, so to speak, as they have no success in locating the expected anchor point. These readers are thus less able to benefit from the hopefully well-structured storyline.

What if a paragraph is extremely short or long? Extremely long or short paragraphs are of course suspect. A long paragraph may have more than one issue and may lack a proper structure. Long paragraphs either need serious pruning or should be divided into separate but properly structured paragraphs with each a single main issue, point and discussion. Short paragraphs mostly have a main issue, but may lack a main point and a proper discussion. This is often a sign that the writer needs some additional study on the topic.

Section headers and where to place them

The writer may decide to create a new section when the storyline is about to introduce an important new topic that will be discussed in more depth and across several paragraphs. However, a section is never a knowledge island within a paper, but should be a continuation of the paper's storyline. A writer of a well-written and coherent text should be able to identify positions in the text where a section may be started. The section heading should be appropriate and capture the text that follows. The reader expects that the idea behind the section header immediately returns in the text. Inappropriate section headers are not recognized in the text that follows them.

If writers cannot find potential section header positions in their own texts, readers may experience such a text as difficult, unconnected or even incoherent. Such a text is not improved by forcing, often inappropriate, section headers on it, but the text needs rewriting to adapt its structure and improve the reading flow.

Testing text coherence

Experienced text editors often test the coherence of a text by reading only the first sentences of each successive paragraph to locate each issue. Incoherence may be detected if the reader/tester perceives a lack of flow among these issues. The tester should then try to find out why that is and whether it can be repaired.

Also less experienced writers may use this method, but to refine a text a writer needs to test the storyline in detail and verify if sentences and paragraphs have the proper structure. Sentences should be both cohesive and connected, and a larger text should be coherent and semantically sound. In general,

Cohesion is not coherence

The following text is cohesive as the sentences are connected, but the text is not coherent as the overall semantic structure makes little sense:

"Many favour the colour blue. Blue sports cars go very fast. Driving in this way is dangerous and can cause many car crashes. Car accidents may cause a broken leg. A broken leg may cause a person to miss a holiday at the beach and that is sad."

the storyline notion makes it transparent why some texts are good reads while others remain unclear and are hard to plough through. See [appendix 2](#) for examples of ‘bad’ paragraphs and some attempts to rewrite them.

Things you better avoid in scientific writing

Below is a list of examples that are not used in scientific paper writing:

- Do not use **verb contractions** such as don’t, doesn’t, can’t etc.
- A sentence should not switch between past and present tense.
- Plural and singular use should not be interchanged: “A **student** needs to practice writing for **their** bachelor thesis.”
- Write an English text from scratch. A linguist will discourage writers who want to first write a text in their native tongue and then **translate** it into English. To have the text translated by a computer program is of course a grave sin and mostly a waste of time. Translating is a profession and any layman's translation is often characterized by an awkward mix of the two languages. Translating from Dutch or German into English may result in something we may call *Dunglish* and *Denglish*.

It may be *perfect* Dunglish or Denglish to write “*My watch is not walking.*”

Prime ministers seem to be quite apt to create awkwardly translated phrases: “*I can stand my little man*” (Dries van Agt), or “*You may say you to me*” (Helmut Kohl). And the Dutch prime minister Joop den Uyl once said: “*The Dutch are a nation of undertakers*”.

Some of the things to avoid in writing are merely a matter of taste. A writer should verify what the reader audience expects. That means that students should ask the individual(s) that assess and grade their paper about their preferences on:

- Right adjusting of a text may not be a good idea as MS-Word provides an imperfect physical typesetting of words that simply increases word distances and hampers the reading flow. Reading flow means that the reader’s eyes and visual attention jump unhindered from word to word. This process is less efficient when successive words adjoin via larger and often irregular spacing.
- Some scientific writers refuse to use **quotes**. Quotes may interrupt the reading flow and could be difficult to integrate in the storyline. These writers believe that a personally written text is preferable. APA nevertheless specifies quoting rules, which are listed in [appendix 3](#).
- Never use a **metaphor**, simile or other figure of speech. Many readers are not native English speakers and using metaphors, proverbs and sayings will often muddle text clarity and hamper the reading flow.
- **Summing-ups** with bullet points (or numbers) are not a good idea in scientific writing. If you want to sum up a number of ingredients of a theory or concept, do that within one or two well-structured sentences. It is not a good idea to spend an entire paragraph on a dry listing of separate items. Always guard the reading flow.
- **Personal language** does not belong in scientific texts, such as “I will study” or “my paper deals with...” Some scientific writers find that personal language makes their text appear subjective.

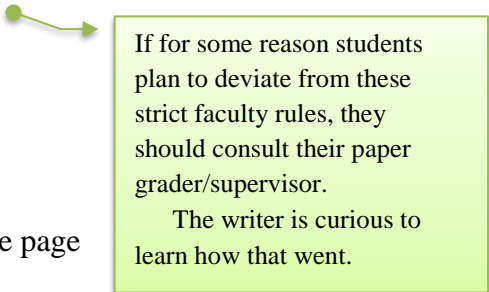
- **Punctuation.** Use commas and semicolons (;) sparingly as they often signal ill-structured and needlessly long sentences. Never use exclamation marks (!).

General formatting of papers: APA rules!

A scientific paper should be carefully prepared according to the style recommended by the American Psychological Association or APA. This style is not merely an advice, but should be treated as a strict set of rules. APA style may not appear very important to a fresh-starting scientific writer, but some supervisors among the teaching staff are very strict about the application of APA style guidelines. Any scientific writer should thus abide to these guidelines, and this especially applies to literature citations and references.

There are, however specific **FPN formatting guidelines** that make sense and that may deviate from and even overrule the overall APA guidelines:

1. Use MS Word for writing any paper.
2. Use the standard Times New Roman 12 pts font (or Arial 11 pts).
3. You are allowed to use 16 pts font size for the title.
4. Throughout a paper use 1.5 line spacing.
5. **Number your pages** throughout your paper. The title page is page 1 unless stated otherwise.
6. Set paper margins (upper, lower, right, and left) to 2.5 cm (the standard MS-Word setting).
7. Begin paragraphs with a horizontal indent, except when the paragraph follows a section heading.
8. Avoid **vertical spacing** between paragraphs, even though MS-Word seems to *like* it.
9. Use a vertical spacing beneath a heading.



If for some reason students plan to deviate from these strict faculty rules, they should consult their paper grader/supervisor.

The writer is curious to learn how that went.

What about grammar?

This handbook focuses on writing style and deals with structure and content of papers. The handbook is not meant to provide linguistic details on English grammar and syntax, even though these linguistic rules provide the proper building blocks for writing. In fact, psychology students are expected to have learned English grammar and syntax at high school.

Writers are expected to keep any paper tidy and error-free. Readers will not appreciate it at all when a text contains grammatical errors and typos. A simple spelling check is often a first step to remove these errors from a text. Even though the MS-Word spelling checker may identify typos, the software does not remove all

Writing a scientific paper

Summary

The overall structure of any scientific paper fits an hour glass shape, which distinguishes an introduction, a middle part and a discussion. It is emphasized that a review paper needs a relatively short introduction of the research question and that the middle part of such a paper provides a well-structured answer based on empirical literature. In an empirical research paper, the introduction provides a more lengthy justification of why the problem is relevant and should be tackled on the basis of the research question. The middle part of an empirical paper then details the research methods and the results of the present study. Any scientific paper requires backup from empirical literature sources and utilises detailed APA standards for citations in the text and to list all references.

The hints given in the previous part of this writing manual should be quite helpful in writing scientific papers. These writing style principles should support the following sections, where the emphasis will be on a paper structure and content. A paper's structure determines the order of specific sections, and a paper's content pertains to what every section of a scientific paper should represent and communicate.

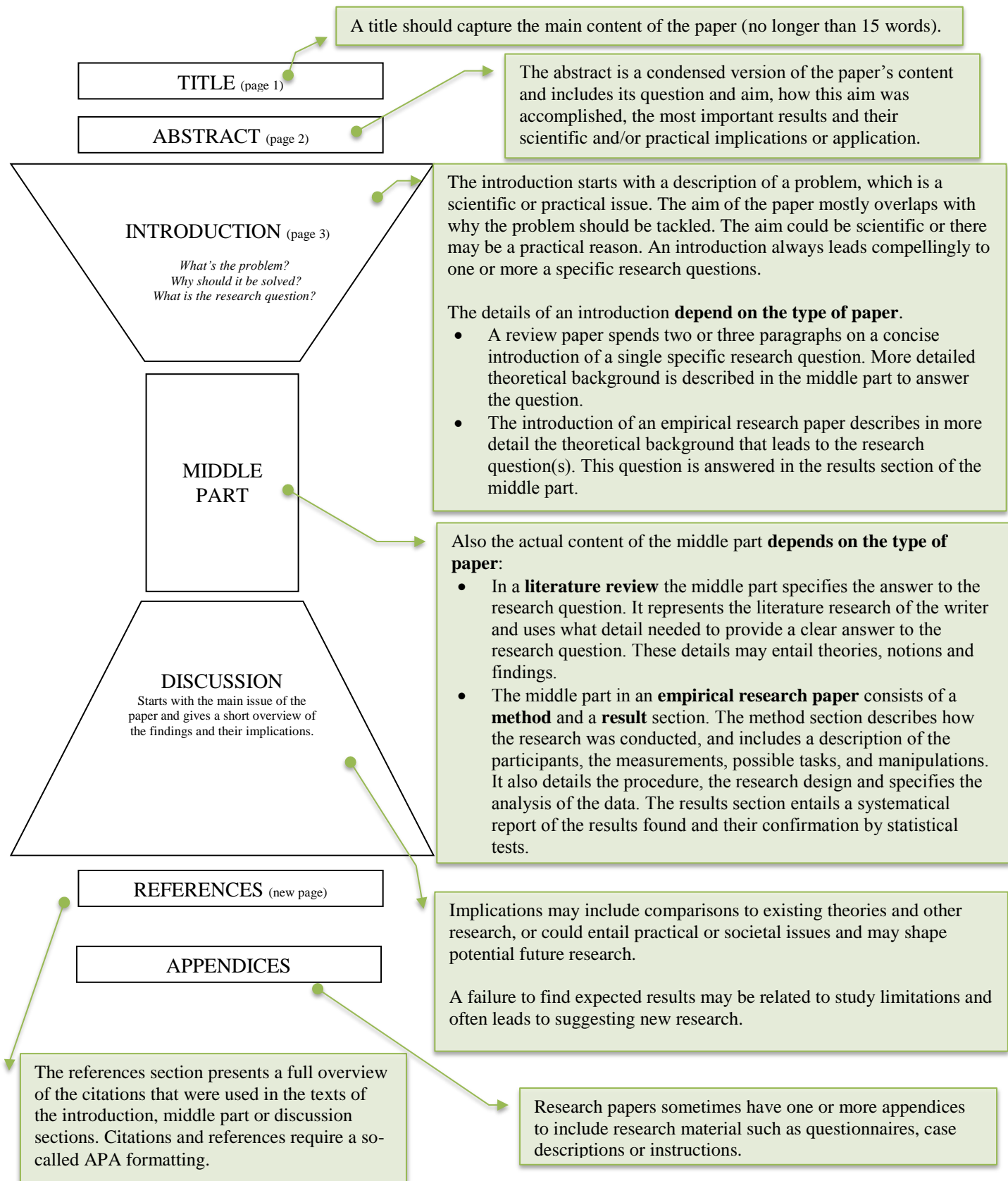
This section will focus on the similarities and the differences of two types of papers, namely the **literature review paper** and the **empirical research paper**. Writing these two types of papers is done in several practicals and assignments throughout the psychology curriculum. And both the bachelor and the master periods are completed with a scientific paper, the thesis.

Plans and preparations required before the actual writing of a paper

Writing a scientific paper is always preceded by selecting a research topic and locating and studying high quality research literature on that topic. The purpose is to create a personal understanding and structure of the scientific content of a topic. It therefore makes sense to create detailed summaries and even workable mind maps of the information that the scientific literature provides. These texts and schematic representations are a necessary starting point, but these valuable structures can never be the end product. To transform this newly acquired knowledge into a research paper, the writer needs to know about how to structure knowledge content into such a paper.

The hourglass shape

The general outline of any scientific paper is schematically represented by an hourglass. The general idea is to describe a problem and to narrow it down to comprehensive proportions that will lead to a specific research question(s) and answer(s). The hour glass then widens again during the discussion section where the found answers are placed in a wider theoretical or practical perspective. The hourglass shape applies to both the review paper and the empirical research paper. See the details on the next page.



The reader should continue with the subsequent pages for more detail about structure and content of the two types of papers.



The literature review paper in more detail

The literature review is often seen as an important starting point for further empirical research (Fernandez-Rios, & Buela-Casal, 2009). The specific reason for writing a review paper is to provide the reader with a succinct and scholarly summary of the relevant research literature that is not just descriptive but also offers a novel insight that inspires further research. Whatever the contents of a review paper, it always starts with a main problem of which the solution is approached via a specific research question.

Review papers are based on research

Scientific readers often complain that literature review papers are not as structured or as straightforward as empirical research articles. This is sometimes true, but it is also easily remedied by basing the review paper on a concrete research question. In order for a review paper to be guided by a main research question, it requires the basic structure as outlined above (and detailed below): the review paper needs to have a beginning, a middle part, and an end.

The topic of a paper can be anything, as the science of psychology is about everything and everyone. The basic requirement is that the selected topic has been investigated and that the studies are published in recognized psychology journals of high quality. The literature review is thus research based and its quality pivots on the writer's understanding of the relevant empirical research literature. The writer may present and discuss identified relations, contradictions, gaps, and inconsistencies that may pertain to theoretical aspects or to how the selected topic has been investigated.

Title and abstract?

A writer mostly waits with creating the paper's title and abstract until the paper is about to be completed. These important aspects of any scientific paper will therefore be described [later](#) in this manual.

There are in fact several reasons to write a review paper. Here are a few:

- A summarizing and exhaustive review may provide a state-of-the-art overview of a body of research on a given topic (i.e., “Women and their claims to multi-tasking: a review of more than three decades of research”).
- The paper may be an opinion piece concerning an empirically justified argument for a given statement (i.e. “Women cannot do multiple different things at the same time”).
- It may pertain to a description of a (somewhat) novel theoretical concept capable of explaining and integrating apparently discordant findings (i.e. “Cognitive biases and illusions, and females’ false claims to multi-tasking”).

No matter what the reason is, a review is always based on a **specific research question**.

The textbook approach: The lack of a specific question

Papers that fail to create a specific question are mostly easily recognized by an expert paper grader. Such a paper mostly lacks a specific storyline and reads as a personal summary. The middle part mostly consists of a number of unrelated chapters and the discussion section is quite short as there is little to discuss.

Paper graders often call this a **textbook approach** as it produces nothing more than an extended personal summary of the literature. The writer apparently knows the literature, but failed to create a story line, which is only possible if the research question is specific.

The introduction section of a review paper

A writer mostly starts the actual writing of a review paper with creating an introduction toward the research question that needs to function as a firm anchor of the storyline.

Such an introduction should concern a description of the topic as the central problem, and somewhere in the introduction the writer should mention and explain why it is essential to tackle that problem (the aim). The introduction should properly introduce, that is, logically and compellingly lead the reader to the specific research question. As a rule, this question should be specific and must be **answerable**. Unsuitable research questions are mostly too broad, such as:

- What are the differences between men and women?
- How is schizophrenia caused?
- Why do children grow up?

Some questions are quite interesting but cannot be answered. We simply lack the knowledge to answer them and some questions even seem unnecessary:

“Can handwriting style predict the age that an individual will reach?”

“Are women better in seeing auras than men?”

“Are people reincarnated after death?”

“When, after the big bang, did stars start communicating among each other across galaxies?”

These questions are concise and interesting of course, but they are not specific. These questions will not lead to a storyline that will guide the reader audience through the text. Such questions often lead to the unfocused textbook approach mentioned on the previous page.

A better question would be: “Are women better at multi-tasking than men are and if so, why?” This question is more specific and also allows for the refutation or more nuanced view of a conventional wisdom, which is always informative and fun to read. See [appendix 4](#) for an extended example and explanation of an introduction.

Making the question even more specific. The question above may become even more specific when the writer understands the topic more fully. The writer may have come to understand that a number of factors are involved in multitasking and these factors differentiate men from women. These factors could be, the type of task, or the ability to prioritise, but they may also be related to time management, or an explanatory factor such as remaining calm under pressure. One or two of these factors may be mentioned in the question, which then creates a more specific point to work with in the answer section of a review paper, the so-called middle part.

Length of the introduction section. A review paper mostly needs only two or three paragraphs to introduce the research question. It is important to keep the introduction concise and tight, because the next part of a review paper (the middle part) will present the actual details from the research literature to provide the answer. In other words, too much detail in the introduction would give away the juicy bits too early.

The middle part of a review paper

When the introduction is completed with a specific research question, the middle part starts with an informative heading (and certainly not Middle or Answer). The content of the middle part concerns the arguments that are for and/or against the position that was taken by the research question. Note that these arguments need to be based on the available research of the paper's topic. In other words, the arguments need to be justified and should be logical.

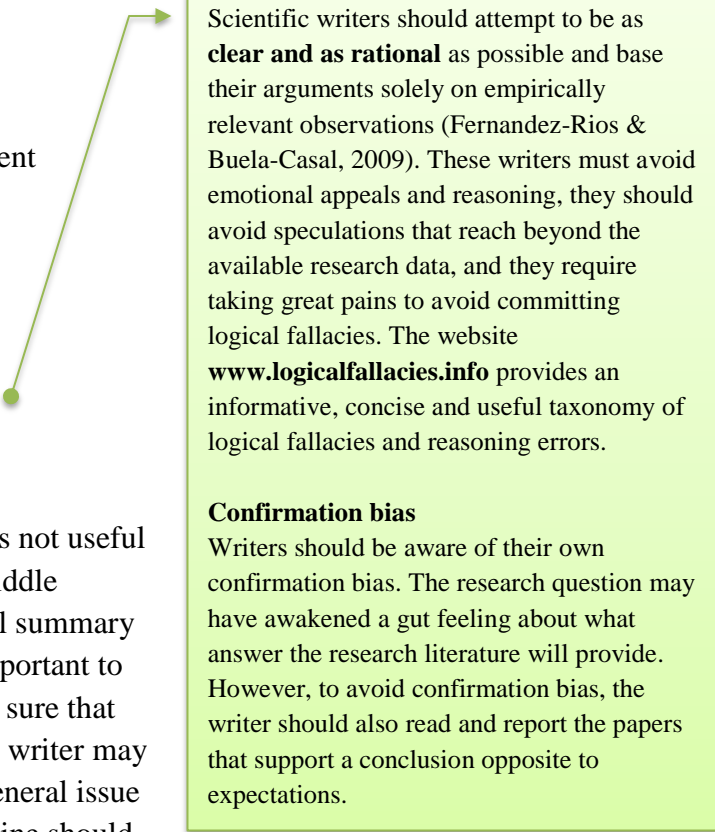
In building successive arguments it is not useful to just summarize a lot of research. The middle section may then easily revert to a personal summary (often with disconnected sections). It is important to continue the paper's storyline and to make sure that the reader stays on it. For that purpose, the writer may start the middle part with rephrasing the general issue and aim of the study. From there the storyline should continue by adding relevant information from the empirical research literature that builds the knowledge base of the reader and gradually works toward the answer of the research question.

If need be, the middle part of a review paper may be organized in different sections, each containing a number of paragraphs. At all times, the writer should attempt to keep the reader interested and help the reader to follow the storyline. The writing style principles covered in the first section of this handbook should be helpful in accomplishing that.

The discussion section of a review paper

The end of any scientific paper is the discussion section. The writer continues the storyline by starting the discussion section with rephrasing the general issue and research question. This is mostly followed by an outline of the most important findings and what they imply. These findings are then discussed in light of similarities and differences with previous findings in the literature. The writer may attempt to explain how the present results (mis)match with (recent) notions and theories, and the writer may focus on potential practical (or even societal) implication.

Fernandez-Rios and Buela-Casal (2009, p. 333) give excellent advice on organizing the end of a paper, namely that conclusions should not be a mere repetition of results. Conclusions should instead clearly state the theoretical and practical



Scientific writers should attempt to be as **clear and as rational** as possible and base their arguments solely on empirically relevant observations (Fernandez-Rios & Buela-Casal, 2009). These writers must avoid emotional appeals and reasoning, they should avoid speculations that reach beyond the available research data, and they require taking great pains to avoid committing logical fallacies. The website **www.logicalfallacies.info** provides an informative, concise and useful taxonomy of logical fallacies and reasoning errors.

Confirmation bias

Writers should be aware of their own confirmation bias. The research question may have awakened a gut feeling about what answer the research literature will provide. However, to avoid confirmation bias, the writer should also read and report the papers that support a conclusion opposite to expectations.

The empirical research paper in more detail

Scientists should communicate their empirical results or else their research might just as well not have been conducted. Remember, a falling tree does not make any sound if there is no one to hear it. To communicate their findings, researchers write an empirical research paper/article and submit it to a peer reviewed science journal to be considered for publication. To be successful, such an article needs (among other things) to be structured and well-written.

The hourglass structure of the empirical research paper is quite similar to the basic outline of the review paper. [Page 12](#) provides the details of how the hourglass shape applies to both paper types, and also shows that the empirical research paper differs from the review paper in regards to two aspects, namely the introduction section and the middle part of the paper.

The introduction section of an empirical research paper

The introduction starts with a broad problem that is subsequently narrowed down by referring to the literature. This is the same for all (scientific) papers. However, the introduction of an empirical paper is mostly much longer than the introduction of a review paper. An empirical paper presents new research and the purpose is therefore to convince the reader that this new research is interesting and relevant within this field of psychology. To accomplish that, the introduction represents all the information from the literature that is necessary to convincingly and logically introduce the research question(s). The writing principles should be quite helpful to make this work. See the example below:

The introduction starts as in any scientific paper, by sketching and explaining a broad problem. The problem may be unknown to the reader, but it should be made relevant from the start. The writer **always** applies (recent) literature to make the issue scientifically relevant.

Introduction

The prevalence of overweight/obesity continues to rise worldwide and whether or not this should be termed an epidemic (or even pandemic), severe obesity poses a serious health risk (see e.g., Olshansky et al., 2005)

Hedonic eating encourages overeating and hence promotes weight gain. Clearly though, the hedonic appeal of a high calorie snack is not equal for all individuals. For example, both restrained eaters and overweight/obese persons, relative to controls, are more prone to work for high calorie snacks (Giesen, Havermans, Douven et al., 2010; Giesen, Havermans, & Jansen, 2010; Giesen, Havermans, Nederkoorn, Strafaci, & Jansen, 2009). Successful weight loss or the prevention of excessive weight gain is often thought to hinge on the ability to suppress a hedonic eating motive (see e.g., Appelhans, 2009; Stroebe, Papies, & Aarts, 2008). Conceivably, this is all the more difficult if this appetitive

The general problem is narrowed down and specified until the text is ready to introduce the specific research question.

The route toward the research question is longer in an empirical paper as compared to a review paper.

motivation for palatable high calorie food is particularly strong. According to this line of reasoning one would expect that overweight/obese individuals show an exaggerated approach motivation for especially high calorie foods.

[...]

... it remains to be determined whether overweight/obese individuals too display this excessive approach motivation for food and if so, whether this is more or less limited to high calorie snack foods. For the present study, we hypothesized that overweight/obese persons display a stronger approach bias toward specifically high calorie foods than normal weight controls do. To test this hypothesis we employed an SRC task very similar to the task used previously by Brignell et al. (2009).

In this case, the research question is reformulated into a specific and testable hypothesis.

Fields within psychology differ in whether they use research questions, expectations or specific hypotheses.

The two middle parts of an empirical research paper: Method and Results

The introduction and middle part of an empirical research paper are quite different. The introduction is meant to convince the reader that the present new study is relevant. The introduction therefore describes in depth all relevant previous results, and the recent theories and notions to back-up the relevance of the research question on which the newly reported research is based. The middle part then describes how this new research was done in the **Method** section, whereas the results of the research are reported in the **Results** section, in which every finding is also substantiated by a statistical test result. The following text illustrates both parts of the middle section.

Research paper versus review paper

The empirical research paper differs from the review paper. This becomes discernible in the length of the introduction and in regard to the specific contents of the middle section.

The method section. The Method section describes in detail the present research that was needed to answer the research question. It is important to understand that these descriptions should be of such high clarity that an interested reader/researcher is able to use these descriptions to repeat/replicate the study.

The method section of a research paper always comprises a number of subsections. The main subsections involve descriptions of **participants**, **materials** and the **procedure**. The specific titles and contents depend on the actual field of psychology in which the research took place.

Participants. The method section starts with the subsection "Participants" (or sometimes "subjects") to describe the sample of participants in the research. All the relevant participant variables should be provided. How many individuals were observed or tested? How many men and how many women were included in the sample? What were their ages (report the age range, mean and spread)?

Some research reports provide more specifics on their participant group as this is relevant to answer the research question(s), but is also essential to replicate the study. Some studies report that participants are right-handed, have perfect vision and

were tested negative on colour-blindness. Other studies select participants to form patient and control groups or ask participants to provide their body mass index as in the example below:

Method

Participants

Eighty-eight undergraduate students from Maastricht University were invited to take part in a study on choice behaviour and mental fatigue. [...] Students were invited to take part on the basis of self-reported Body Mass Index (BMI; kg/m²). [...] Participants with a BMI ≥ 25 were classified as overweight or obese, participants with a BMI between 18 and 25 were classified as normal weight.

Materials. A second subsection of the method section is intended to describe the used material and/or equipment in the study. Equipment may involve computers or other specialized equipment, but instruments may also refer to questionnaires or the means to interview or observe participants. The heading of this subsection may be Materials or Instruments. The example below describes the use of both a subjective (visual analogue scale) and an objective measurement instrument (a reaction time task via a computer program):

Materials

Hunger ratings. Participants rated their momentary hunger on a 100 mm Visual Analogue Scale (VAS) ranging from 0 “not at all hungry” (left anchor) to 100 “very hungry” (right anchor).

Stimulus response compatibility (SRC) task. The task the participants had to perform was adapted from the SRC task described by Thewissen, Havermans, Geschwind, van den Hout, and Jansen (2007) and was programmed in E-prime (Psychology Software Tools, Inc). The task comprised two blocks of 80 trials. In each trial, either a 160 mm high x 215 mm wide food picture (10 different food pictures were used; e.g., a picture of chocolate cookies, grapes, crisps, et cetera) or a neutral picture (10 different neutral non-food pictures were used; e.g., a wooden shoe, a traffic cone, a cardboard box, et cetera) was displayed at the centre of the screen together with a manikin (an approximately 18 mm high x 10 mm wide matchstick figure) placed exactly between the outer border (either the upper or lower border) of the picture and the edge of the screen.

Each block of trials had a different stimulus response assignment. In one block the participants were instructed to approach the food pictures with the manikin by using the up- or down arrow keys depending on the starting position of the manikin, and to avoid the neutral picture by moving the manikin away from the picture outside the screen. The following trial was initialized upon completion of the correct response (i.e., approach or avoidance) and the time to complete each trial was

recorded (in ms). A correct response required a minimum of five consecutive key presses. In the other block, participants received the instruction to avoid the food pictures and to approach the neutral pictures as quick as possible. The order of these two blocks and the eight different trial types (position [above or below] x picture [food vs. neutral] x instruction [approach vs. avoid]) per block was determined randomly for each separate participant.

The task was preceded by a practice session that comprised two blocks of 16 trials each. In one block they had to approach pictures depicting a chair and to avoid pictures displaying a lamp. This stimulus response assignment was reversed for the other block.

Procedure. A third part of the method section includes a description of the study procedure to illustrate how the research was conducted and what was expected of the participants. For example:

Procedure

The experiment was approved by a local ethical committee. Participants were instructed to eat two hours prior to the experiment and from that time on to refrain from food until participation. Participants were tested individually between noon and 6 PM. The experiment started with a brief verbal description of the general procedure of the experiment. After this, all participants also received written information regarding the experiment and were asked to sign a consent form if they still wished to participate.

The participant was asked to rate his degree of momentary hunger on a VAS, after which he first completed a task designed to assess the reinforcing value of a given snack food relative to the value of a fruit or vegetable alternative. Participants had to work for their highest liked snack food and their highest liked low calorie food (i.e. fruit or vegetable). Throughout the task the work effort required for snack food was gradually increased, thus allowing us to determine the relative motivation to work for or acquire high calorie snack foods. The task procedure is described in detail by Giesen, et al. (2010). This task was generally completed within 20 min and note that any ‘earned’ food was consumed only after the completion of both this so termed concurrent schedules task and the SRC task. ... The participant was then thanked and received either a course credit or a € 7.50 monetary voucher as remuneration.

Authors of empirical papers usually include a subsection called **Analysis** to describe how the data were collected and processed, and what statistical design and tests were used. When the data are quite complex the writer also has to report on how this complexity was reduced to make statistical analyses possible. For example:

Data Reduction and Analyses

All analyses concerned the participants' response time latencies to the different trial types and stimulus response assignments in the SRC task. To remove outliers, reaction times were excluded per participant and per trial type if they were smaller than 200 ms or larger than 2.5 SD above the mean RT (10% of the data) (see also Thewissen et al., 2008).

Weight, gender, and food approach/avoidance. To assess whether overweight/obese participants show a stronger food approach bias than the normal weight participants do, response times for each participant (food approach vs. food avoidance) were averaged for the food approach assignment and the food avoidance assignment. These averaged RTs then served as the dependent variable in a 2 (Group: overweight/obese vs. normal-weight) x 2 (Gender: male vs. female) x 2 (Assignment: food approach vs. food avoidance) ANCOVA with hunger ratings as a covariate.

The Results Section. The middle part of an empirical research paper is completed by the Results section. The general idea is to provide an overview of the results and of their statistical confirmation. The order of these descriptions (results vs. statistics) depends on the part of psychology the research belongs to. In some fields, the reader is immediately referred to a figure or table, whereas results sections in other parts of psychology start with an overview of the statistical confirmations of the research questions or hypotheses.

In all cases, statistical test results and the relevant test values need to be described in detail and according to APA standards. Tables and figures describe and depict the found data patterns between independent and dependent variables. Both tables and figures are numbered. A table's content is described via a heading and what a figure depicts and illustrates is described by its caption underneath. Descriptions of tables and figures need to be detailed in regard to the variables and where they are located in the graph or table. See [appendix 5](#) for some more details.

Although the results section often comes across as technical, it should contain a storyline and help the reader to understand. See below an example of a bar graph followed by the text in the corresponding result section:

Results

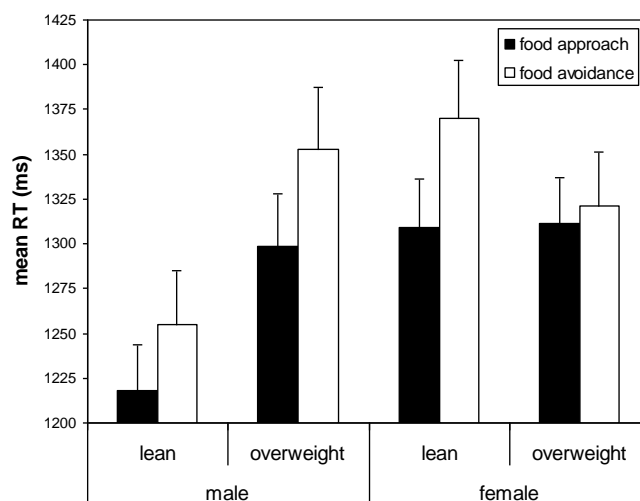


Figure 1. Mean RT (+SEM) per response assignment per gender and for each group.

In Figure 1, the mean RTs per assignment are displayed for each group and separately for each gender. When comparing the food avoidance assignment RTs and the food approach assignment RTs, no main effects were found (largest $F[1, 83] = 2.75, p = .10$), but a near significant Group \times Gender interaction was found, $F(1, 83) = 3.75, p = .06, \eta^2_{\text{partial}} = .04$. This two-way interaction though is qualified by the overarching Group \times Gender \times Assignment interaction, $F(1, 83) = 5.09, p = .027, \eta^2_{\text{partial}} = .06$. In post-hoc analyses, we examined a potential two-way Group \times Gender interaction for the food approach and food avoidance assignment separately. This interaction was found only for the food avoidance assignment RTs, $F(1, 83) = 5.16, p = .026, \eta^2_{\text{partial}} = .06$. We further examined this interaction by testing for a difference in mean RTs between the overweight/obese and normal weight participants for each gender separately by means of independent samples t-tests. These tests revealed a significant difference between the overweight/obese men and normal weight men ($t[42] = 2.24, p = .03$), but not between the overweight/obese women and the normal weight women in the sample ($t[42] = 1.03, p = .31$). Overweight/obese male participants were much slower to avoid food stimuli than the normal weight male participants were.

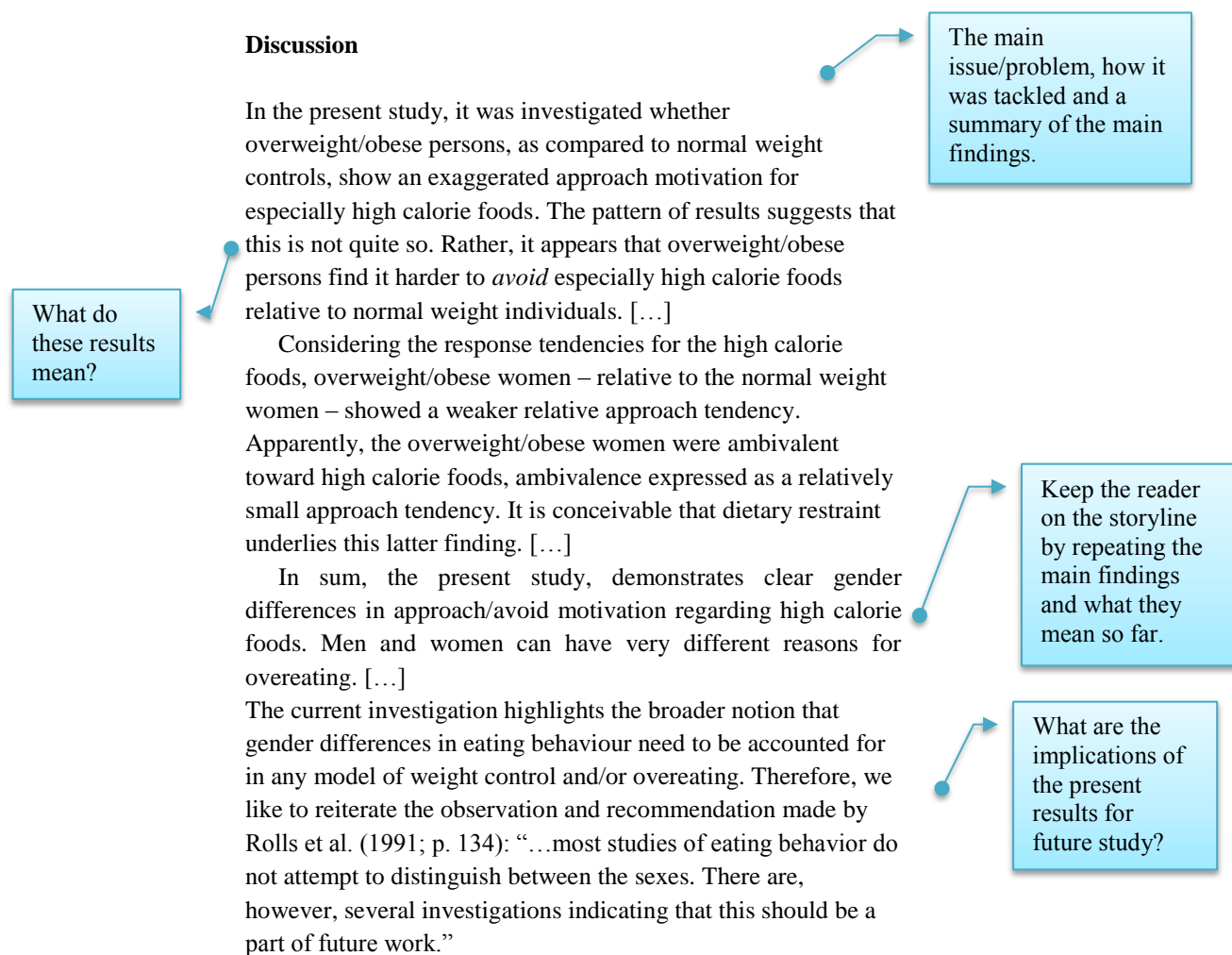
Some researchers also add a concise implication of their results into the results section.

In this way the reader keeps better track of the storyline.

The discussion section of an empirical research paper

The structure and content of the discussion section of an empirical paper and of the review paper are quite similar. Both follow the similar order of topics. To recap, the discussion starts with rephrasing the main problem and why it is important to investigate. The text then continues with a concise overview of the main results and

discusses their implications in terms of differences or similarities with other research findings. The writer may also address potential practical or even societal applications. Writers of an empirical paper often report on the limitations of their own research method and how to take these limitations into consideration in future research. Limitations do not make the research completely worthless. Undertaking research is difficult and there is no such thing as the ‘perfect study’. An example of a well-structured discussion section is as follows:



Final discussion paragraph. The researcher wants to end the discussion by demonstrating to the reader that the research adds to the understanding of the problem that the paper commenced with. This may be achieved by outlining the most relevant results and their theoretical and potential practical implications.

It does not make sense to end a discussion with self-demeaning remarks and/or stress that the research amounted to nothing. Such a remark will backfire on the storyline, since the reader is now signalled that reading this paper was one big waste of time.

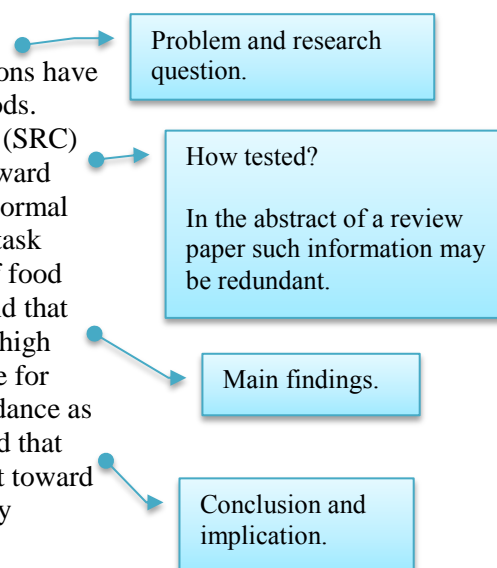
The parts of scientific papers that are written last: Abstract and title

Abstract. A scientific paper's introduction is usually preceded by an abstract. The abstract captures the entire article's content and that is why the abstract is written last (Glasman-Deal, 2010). Readers, however, will often first read a paper's abstract to decide whether to continue with the rest of the paper. That is why the abstract needs to be both brief and clear, and is written as a single paragraph no longer than 150 words. References have no place in an abstract. Key words are often added after it. For example:

Abstract

In this study, we hypothesized that overweight/obese persons have an exaggerated approach tendency toward high calorie foods. Testing this hypothesis, a stimulus response compatibility (SRC) task was used to assess approach-avoidance tendencies toward food in both overweight/obese participants ($n = 42$), and normal weight controls ($n = 46$). The SRC task is a reaction time task measuring how fast one approaches and avoids pictures of food and non-foods according to given instructions. It was found that overweight/obese men are slower at avoiding particularly high calorie snack foods. But this does not appear to be the case for overweight/obese women who showed nearly as fast avoidance as approach toward the high calorie food cues. It is concluded that overweight/obese women, rather than men, are ambivalent toward high calorie foods, which is the likely result of high dietary restraint.

Keywords: appetite; approach-avoidance; dietary restraint; gender; obesity



Title page. Most papers have a title page with a title that captures the content of the paper, but also the writer's name (ID), context (faculty, programme, and course), potential supervisor(s) and a word count. Page numbering mostly starts at this page.

The title itself needs to be informative, but cannot be longer than 15 words. Hilary Glasman-Deal (2010; p. 225) aptly notes that the title predicts and describes the content of the paper as accurately as possible. Glasman-Deal is right, but it should be added that the title should also attract readers. Writers want readers to read their coherent papers, and should ensure that the content of the title immediately returns in the first sentences of abstract and introduction.

The research paper as shown above had an initial title:

“Individual differences regarding automatic approach-avoidance tendencies towards high energy dense foods”

This title covered the content of the paper, but was not attractive enough to a wide readership. The final title was the following, pithier one:

“Weight, gender, and snack appeal”

But a title may also refer to the research question:

“Overweight individuals have a high approach tendency toward high-calorie foods”



Citations and the reference list

All scientific work is based on empirical literature. This means that scientific writing always needs citations within all parts of the main body text, and that a paper is completed by a list of all the literature sources referred to.

Citations

The standard way of how psychologists refer to sources within the science literature is outlined by the American Psychological Association (APA) in their Publication Manual. The APA rules for within-text citing state that surnames of the authors of the consulted source and the year in which that study was published should be mentioned in parentheses. For example:

One author:

Redden (2008) found that merely perceived variety can slow satiation
Merely perceiving variety can slow satiation (Redden, 2008)

Two authors:

According to Lowe and Levine (2005), food intake is governed by
physiological needs and hedonic eating motives.

If the published study was written by two authors, then always mention both authors. The writer can refer to that study directly as in the example above or indirectly as in the example below:

Food intake is governed by physiological needs and hedonic eating
motives (Lowe & Levine, 2005).

The devil is in the details

Note that in this example, the author surnames are also placed between parentheses and now the conjunction 'and' is replaced by '&'.

To complicate things further, APA rules dictate that the first citation of an article or book chapter with three, four, or five authors, must list the surnames of all these authors. Subsequent citations of the same source only mention the surname of the first author followed by et al. (which means "et alii" and is Latin for "and others") as in the following examples:

Direct citation:

To test this hypothesis we employed an SRC task very similar to the task used previously by Brignell et al. (2009).

Indirect citation:

To test this hypothesis we employed an adapted version of an SRC task used in a previous study (Brignell, et al., 2009).

A cited source with more than 5 authors always mentions the surname of the first author followed by 'et al.' (as in the example above). When a work has 6 or more authors, it always mentions the surname of the first author followed by 'et al.'.

Another matter of taste: The position of citations within a sentence

Some researchers prefer indirect citing and position their citations between parentheses at the end of a sentence. These researchers feel that such a citation does not interrupt the reading flow. When a writer begins a sentence with a citation, such a usage may violate the sentence structure as explained in the first part of this writing manual. In that case, it needs some writing skill to create a cohesive string of sentences.

New scientific writers often begin a sentence with a citation to give them some security. A rookie scientific writer would start a paragraph like this, which still reads as a personal summary (The thumb down icon therefore means that rewriting is still required):



In a scientific study of van Doorn and Hulsheger (2013), the researchers did an investigation to find out whether positive self-views would function as a shield against the impact of job demands on psychological strain reactions. They could show that positive self-views had a negative impact on the relationship between job demands and strain reactions.

Any critical reader would immediately notice quite some redundancy in the otherwise grammatically correct text. In fact, the terms *study*, *researchers*, *investigation*, *find out* and *show*, all refer to a single concept that needs not to be repeated over and over again. Moreover, the relationship between all the studied variables is mentioned twice. The writer may want to improve the reading flow and rephrase much of this *psycho-babble*, and also complete the new text by an indirect citation:



Positive self-views weaken the relationship between job demands and strain reactions (van Doorn & Hulsheger, 2013).

or



Employees with positive self-views experience less strain in situations of high job demands (van Doorn & Hulsheger, 2013).

References

A reference list is positioned after the discussion section and starts on a new page. All references are placed in alphabetical order on the basis of the surname of the first author of the paper. For citations and references, one should apply strict APA (American Psychological Association) rules. APA manuals are to be found in every university library and can also be bought/ordered at the Study Store. Many websites also explain the finer details of how to prepare your paper and endnotes in APA style. There is a useful APA style tutorial at www.apastyle.org. The following are some examples of several reference types (articles, book sections and edited books). Note that there are strict styling rules per reference type:

Journal article

Template:

Author, A. A., Author, B. B., & Author, C. C. (year). Title of article. *Title of Periodical*, xx, pp-pp. doi:xx.xxxxxxxxxx

Please include the digital object identifier (doi), when provided by the journal publisher. This number uniquely identifies the paper referred to.

Examples:

Appelhans, B. M. (2009). Neurobehavioral inhibition of reward-driven feeding: Implications for dieting and obesity. *Obesity*, 17(4), 640-647.

Bongers, P., Jansen, A., Havermans, R., Roefs, A., & Nederkoorn, C. (2013). Happy eating: The underestimated role of overeating in a positive mood. *Appetite*, 67, 74–80.
doi:10.1016/j.appet.2013.03.017

Journal article with more than 7 authors: cite the first 6 authors and then the final author:

Kilpelainen, T. O., Qi, L., Brage, S., Sharp, S. J., Sonestedt, E., Demerath, ... Loos, R. (2011). Physical activity attenuates the influence of FTO variants on obesity risk: A meta-analysis of 218166 adults and 19268 children. *PLoS Medicine*, 8, e1001116.

The weird page range in this reference is because this paper is an 'e'lectronic (i.e., digital) and not a paper publication.

Book reference

Template:

Author, A. A. (1967). *Title of work*. Location: Publisher.

Example:

Meyer, M. F. (1921). *The psychology of the other one*. Columbia: The Missouri Book Company.

Book chapter in edited book

Template:

Author, A. A., & Author, B. B. (1995). title of chapter or entry. In A. Editor, B. Editor, & C. Editor (Eds.), *Title of book* (pp. xxx—xxx). Location: Publisher.

Example

Morris, E. K., & Todd, J. K. (1999). Watsonian behaviorism. In W. O'Donohue, & R. Kitchener (Eds.), *Handbook of behaviorism* (pp. 15-69). London: Academic Press.

A paper may make references to **other sources** than the ones mentioned here.

The APA manual specifies how these sources need to be referenced.

Table of contents in a research paper?

A table of contents (TOC) is required to finalize any extended research paper written at FPN. Such a table is positioned on a separate page immediately before the abstract. The writer must decide on which (sub-) headers are informative items of a TOC. When the text has many sections and sub (sub) sections, it may not be necessary to represent all these headers in such a table. A complex TOC may even discourage a reader and it is advisable to avoid a 'table of clutter'.

Fraud and plagiarism

A big difference between a novelist and a scientist is that the novelist can lie. Scientists cannot lie in their writing. If they would lie all the time, nobody would be able to trust anything any scientist says or claims anymore. Other than that, results and theories would be useless. We would not have to pay for energy if the second law of thermodynamics proved to be a big fat lie, or painkillers did not kill pain, etc. Science only works if everyone diligently and honestly reports data. That's why we – as scientists – take scientific fraud very seriously.

Researchers can make all kinds of claims, but these claims need to be backed up by research through verifiable citations and reference lists. The same applies to students, even though some students find it tempting to simply paste a paper together with beautifully long sentences and even whole paragraphs cut from the already written works of someone else. This type of copying is considered **plagiarism** since a student would then take credit for someone else's work. Scientific papers therefore always cite sources or ideas, arguments, and findings (APA, 2010).

All written assignments at FPN are checked for plagiarism. If you do research, remember that the data is the property of Maastricht University and you must submit all the raw data to your research supervisor once you complete your research. If you are caught plagiarizing or committing research fraud, you will have to appear before the exam committee who will decide on fitting terms of punishment.

Psychology professor found guilty of fraud

In 2011, Diederik Stapel, a social psychologist Professor and Dean at Tilburg University, was found to have fabricated data out of whole cloth. He was fired and a committee examined and proved the size of the fraud and to be extensive.

Thus far, 54 internationally published papers (co-)authored by Stapel have been retracted. Among these retracted papers was a high profile publication in the journal *Science* in 2010. In this paper Prof. Stapel claimed to show that a disorderly environment promotes stereotypical thinking. The data were fabricated and in many instances the studies had never even taken place.

Diederik Stapel has handed back his doctorate and he will never be able to work in academia again.

How to avoid plagiarism

Plagiarism is considered an academic crime and should be avoided at all cost. A researcher needs to know what is considered as plagiarism. The following examples illustrate what is still considered plagiarism:

1. Copying a paragraph from a given source, changing two words in every sentence and then to provide a reference to the original source.
2. Copying a paragraph from a textbook, giving a citation.
3. Self-plagiarism: To reuse a paragraph or even a whole section from an earlier completed writing assignment.

These are all forms of plagiarism, with or without a citation. Such copy work is often easily detected, as the writer suddenly appears to change writing style.

Solution: Rewrite the entire paragraph.

Since some authors can write their ideas and describe difficult concepts with such ease and skill, it can be tempting

The process and assessment of most scientific papers (submitted in FPN)

Students who write scientific papers within the FPN programme are expected to be motivated to improve their writing skills. This motivation includes students' commitment to all the phases of any writing assignment, and also to writing larger papers and theses. For theses these phases include, selecting a topic and studying the empirical literature, making contact with a staff-member, and the entire process continues until the final version of the paper is completed and graded.

Students are expected to submit subsequent, completed versions of their paper and in a timely manner. Deadline dates may be set and published by the faculty. Students will receive feedback and are expected to apply this feedback to improve their written work.

When the final version is submitted, the paper grader will provide the student with a concise description of the quality of the final version in terms of structure, content and style. Be aware that the final grade captures the quality of all submitted versions (as specified in the faculty regulations (OER)). The staff-member will submit this grade to the Education Office on a separate form.


Paper grading criteria

Faculty regulations ([OER](#)) determine that paper graders must consult the handbook writing skills for criteria to grade papers regarding writing style, structure and contents. There is a maximum size to both the bachelor and master thesis. The bachelor thesis has a maximum of 6000 words and for the master thesis a maximum of 8000 words applies. These maxima exclude the references list and possible appendices. Students should always agree with the supervisor on the size of a thesis.



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In summarised form this text is available at:

<http://www.bartleby.com/141/>

You may also want to read some elegant critical remarks on this little book on *how to write* by Strunk and White (2000):

<http://chronicle.com/article/50-Years-of-Stupid-Grammar/25497>



Williams' text is often regarded as an excellent book on how to write. Some comments on the main approach are found here:

<http://grammarteaching.wordpress.com/2012/04/13/review-of-style-lessons-in-clarity-and-grace-by-joseph-williams/>

Appendix 1: Examples of ‘bad’ sentences

Below are some examples of sentences that most readers perceive as more difficult to read (these receive a thumb down). There are many ways of rewriting each of these ‘bad’ sentences and some attempts are shown (receiving a thumb up):



Psychologists, often serious about their profession and proud of their accomplishments, but as any other scientist, need practicing writing skills.

It already helps to replace commas by active verbs.



Psychologists are often serious about their profession and proud of their accomplishments. But as any other scientist, psychologists also need to practice writing skills.



The elderly, who now get a double personal exemption (an elderly couple gets four exemptions worth \$1,080 per exemption, instead of only two), would be abolished.

Delete unneeded information.



Older citizens no longer receive a double personal exemption of \$2,160.



Much too frequently, the criminal escapes the scene of a crime because he manages to escape the visual capability of the responding officers.

Simplify pompous language (a)
or
Simply state the truth (b).



- a. A criminal often escapes a crime scene, because he remains invisible to the responding officers.
- b. Responding officers mostly arrive too late at a crime scene to arrest a criminal.



It is the wordiness of my writing that is indicative of the fact that there is little that I have to say.

Simplify.



I have little to say.



Scientists disagree with each other due to their different opinions.

Circular reasoning without any explanation at all. Rewrite and be specific!



Scientists disagree.



The elimination of needless nominalizations is dependent on the reversal of the conversion process.

Example of a sentence with nouns that should be verbs (**nominalizations**).



A writer needs to turn nouns into verbs to eliminate needless nominalizations.

Sometimes it is best to identify the actor that is meant in such a sentence and use active verbs.

Appendix 2: Examples of ‘bad’ paragraphs

A *bad* paragraph may be grammatically correct, but readers may perceive it as unconnected to the previous text, or readers may feel that such a paragraph is dull and is difficult to understand. Any accomplished writer should be able to recognize such a paragraph and to improve its readability. This is done by establishing a proper introduction of a topic and discussing it. See below for some attempts which also demonstrate that scientific writing should generally be more concise than the writing used in a descriptive novel:



When all else was stripped from him, the great Cyrano de Bergerac, with his dying breath, was able to say, that he had had his panache. Though there is nothing of the dying breath about the Irish Museum of Modern Art, there is nevertheless a fundamental and very obvious dilemma facing its board and director: how does a new museum of modern art come into existence, in the last decade of the twentieth century, and find for itself pictures to hang on its walls?

The paragraph starts with an analogy and then forces the reader to *connect* it to an incoherent and exaggerated text about the issue that the museum faces.



The issue that our new museum faces is how to start a new collection of paintings.

One solution is to make things shorter and state the main issue.



There are a variety of cohesive devices, both lexical and grammatical, of which linkers (*and, so, but*) are just one. To apply cohesion is best done by paying close attention to the way sentences are linked in a paragraph. Identifying lexical chains in texts - that is, repetitions, the use of synonyms and hyponyms, and words from the same lexical field - is also a useful way of alerting a reader to the key role that lexis has in binding a text together.

This paragraph on cohesion could be improved on cohesion, and there is no strict distinction between the concepts cohesion and coherence.



A writer improves cohesion in a paragraph by paying close attention to the way the subsequent sentences are linked. The writer can choose from a number of cohesive devices, such as the use of conjunctives (*and, so, but*). Cohesion also implies that a text has so-called lexical chains, which include repetitions of main topic words, and the use of synonyms and hyponyms. A cohesive text comprises the proper wording and sentence structure, which allows the reader to bind a text together.

The paragraph remains vague on how a paragraph must be structured.



Coherence is more elusive but it has a lot to do with the way that the propositional content of texts is organised. If the content of a (written) text is organised in such a way that it fulfills the reader's expectations, it is more likely to achieve its communicative effect. This means that beginners can be helped to write coherent texts through the analysis of the generic features of particular text types. This has long been the approach to teaching business, technical, and academic writing. More important still, is second-guessing the intended reader's questions, and then answering them. This means that it is

One way to improve coherence is by turning this paragraph into a more clear and active text.

Some meanings are quite unclear:

Elusive?

What are generic features?

How can second-guessing lead to a clear idea?

important that, when doing writing tasks, writers have a clear idea both of the purpose of the text, and of the intended readership. Good writers are able to "keep their reader in mind". Keeping your reader in mind does not guarantee coherence, but it would seem to be a prerequisite.



Coherence is not the same as cohesion. This is because coherence depends on the overall semantic content of a text. Such a text is more communicative when it provides the content and structure that the reader expects. This means that rookie writers should practice to both identify and create the overall semantic structure of texts. And writers of any type of text need to listen to what the reader wants. In other words, writers should have a clear idea of the purpose of the text and should know the intended readership. Accomplished writers of coherent texts are persistent in keeping their readers in mind and this is not restricted to academic writing, but also pertains to business or technical writing.

Coherence can be considered as a writing tool. In fact, some anecdotes often violate coherence on purpose:

After visiting Africa, Captain Spaulding recounted his safari adventures:
"One morning I shot an elephant in my pyjamas. How it got in my pyjamas, I do not know."

But some texts violate coherence altogether and become a hit. This song text conveys the general feeling of being free and happy:

"It might seem crazy what I am about to say
Sunshine, she is here you can take a break
I am a hot air balloon that could go to space
With the air like I don't care, Baby by the way."


Pharrell Williams - "Happy"

Appendix 3: How to use quotes in scientific work (not recommended).

Every scientific writer needs to know about the strict APA rules of how to place quotes in a text. Knowing these rules does not mean that a writer can quote effectively or must use them in the first place. It is mostly hard work to match a quote with the storyline of a paper.

Despite these sincere warnings to be very cautious with quoting, a scientific writer needs to know the rules of how to quote in APA style. Some examples:

Behavioural economist Dan Ariely (2012, p. 78) noticed the following: “In an average semester, about 10 percent of my students come to me asking for an extension because someone has died—usually a grandmother.”



Some rookie writers try to escape serious writing altogether by simply stitching up a text and by showering the reader with one quote after another. Not a good idea. Such a text does not take the reader seriously, and as the text knows no storyline it may be described as sloppy, disconnected, murky, unfocused or even as ugly and awkward.

- If the quote is over 40 words long, the writer needs to present it as a separate block of text.

Behavioural economist Dan Ariely (2012, p. 78) noticed the following:

“In an average semester, about 10 percent of my students come to me asking for an extension because someone has died—usually a grandmother. Of course I find it very sad and am always ready to sympathize with my students and give them more time to complete their assignments. But the question remains: what is it about the weeks before finals that is so dangerous to students’ relatives?”

Appendix 4: The introduction section of a review paper (example)

The example is from the introduction of a 2007 paper written by Remco Havermans and Anita Jansen on evaluative conditioning.

As preferences and aversions are important determinants of human behaviour, much research has been devoted to understanding the nature of human likes and dislikes. Some preferences and aversions are innate, such as the preference for sweet tastes and the aversion for bitter tastes. However, most preferences and aversions are acquired with experience (Capaldi, 1996). Associative learning has been proposed as the primary mechanism underlying such development of likes and dislikes (De Houwer, Thomas, & Baeyens, 2001). In 1975, Levey and Martin demonstrated associatively acquired affect. In this seminal study they first let participants categorize pictures of paintings as liked, neutral, or disliked. In the subsequent conditioning phase, neutral pictures were consistently paired with either a liked, disliked, or another neutral picture. At test, where participants had to evaluate the pictures that had been presented during conditioning, it was found that the neutral pictures paired with the disliked stimuli were evaluated as more negative. Similarly, the neutral pictures paired with the liked pictures were now evaluated as more positive. Martin and Levey (1978) coined the term evaluative conditioning (EC) in referring to this apparent associative learning of preferences and aversions.

[...]

Although EC has been studied extensively over the last three decades there is still considerable debate concerning the associative nature of the learning of likes and dislikes. In this chapter, we summarize different demonstrations of EC and discuss to what degree these findings can be conceptualized as a form of Pavlovian stimulus-stimulus learning. The foremost accounts of EC are evaluated in the light of this discussion. It is argued that none of the present models of EC provide a satisfactory account of EC. In the second part of this article we discuss the development of a new model to account for the variety of EC effects.

The introduction of any scientific paper starts with the broad description of a problem.

The writer now introduces the main issue of the paper.

The **aim**: why is it necessary to tackle the problem and thus why is this paper important.

The writer is free to position the aim in the introduction. Such a point could be made early but also later as in this example.

In this case, the research question is formulated as an aim/statement. A detailed and workable question for this paper may be:

“Do individuals develop their liking or disliking of food intake via Pavlovian learning?”

As in this example, the introduction section of some review papers may be completed by some lines with details on what comes next. Some papers even end their introduction with an overview of what topics were searched for in what database, and on the basis of which keywords. Students should discuss and agree with their supervisor on the necessity of adding such a paragraph or perhaps even create a separate method section.

Appendix 5: Tables and figures in a paper

Figures and tables in scientific papers are embedded in the text of the results section and are meant to help the reader to understand the results. Importantly, tables and figures should not become islands in a text and should be timely and appropriately referred to in the text of the paper. Such a description should contain detailed information of the data patterns and may convey statistical results to confirm the visible patterns. An example:

...Table 1 provides the raw performance scores of the three tests. Figure 2 depicts the overall data patterns at time 1 and 2 (panels) of the route performance test scores as a function of test type and concurrent task. At first glance the data patterns did not dramatically change from measurement time 1 to 2, which may explain the absence of two- and three-way interaction of time with both other factors. There was however a significant main effect of time on test results ($F(1, 39) = 41.17, p < .0001, \eta^2 = .51$)....

It is not permitted to copy tables and figures from statistical software output into a paper. Paper writers must create their own tables and also make figures presentable before adding them to a paper. All tables and figures should be numbered (e.g. Table 1, Table 2; Figure 1, Figure 2).

Table formatting. Each table should have an individual title, italicized and presented with each word capitalized (except *and, in, of, with*, etc.). Horizontal lines can be used in tables to separate information and make it clearer. Do not use vertical lines. A table can be either single-spaced or double-spaced. Keep the table readable and the spacing consistent. Some APA examples are presented on this site:

<https://owl.english.purdue.edu/owl/resource/560/19/>

Figure formatting. See the site below for a checklist and some APA examples of figures:

<https://owl.english.purdue.edu/owl/resource/560/20/>