

Writing a good summary

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Why are you writing this?

Because.....

If you haven't written it
you haven't done it.

But that is only part of the story

Why write well?

Because:

If nobody reads it.....
you haven't done it.

and...

If they read it and don't
understand it,
you still haven't done it.

Your primary aim in writing a paper (or
in this case, a summary) is to have as
many people as possible *read* it,
understand it and *be influenced* by it.

It should *not* be

- To appease your boss
- To satisfy the business managers at DAFWA
(or anywhere else)
- To impress people that you know a lot of big
words or trendy expressions
- To swell the bibliography section of your CV

Getting into the right frame of mind

What is writing on research all about?

The positive approach

I have just been part of adventure in
research and I have a contribution to
make.

In this article, I am going to help you,
the reader, share the adventure and
recognise my contribution.

The ~~negative~~ approach passive

- Research is the art of investigating a field and finding out information that didn't exist before.
- You, the reader, are a involved in research.
- I have written down some details.
- Use your skills in research to see if you can work out what is my new contribution

The fact

- Readers don't really want to read your article.
- They have plenty of other things to do

The aim

- You give them a reason as soon as possible in the article to want to read on
- And you retain their interest until the last full stop

The reality

- Occasionally a reader will read to the last full stop.
- Most will not.
- Your job is to make sure that whatever they do read will expose them to the most important information that you have to offer and that they will retain it.

How?

- Structure
- Logic (ideas in their proper sequence)
- Readability (style)
- Economy (no false paths)

Why?

- The reader's mind is not a sponge
- It can only take in and retain information by relating it to what it already knows or expects to find out.
- So, the key is to get readers to expect certain sorts of information and then deliver the detail in a way that satisfies their expectation.

Basic rules about getting started. 1

- Never start to write anything before you work out how it should end.
- Reduce the section of work in front of you to a size that you can handle
- Write the opening sentence of that section— then the last sentence. It tells you where you are going.
- Then, fill in the sentences between the two.

Basic rules about getting started. 2

- Write in the style that you would use in a conversation with a friend.....fix the imperfections later.
- Get your initial thoughts down and build up your confidence.....fix it later
- Fixing (or editing) existing text is much easier than creating new text

The Characteristics of scientific writing that distinguish it from all other styles of writing

- Precision
- Clarity
- Brevity

The good news about scientific writing

- If you ensure that you are precise, clear and brief, there are no other specific rules to worry about.
- There are no hidden agendas — the most acceptable scientific style is plain, simple English
- Write to inform not to impress

"Impressive" writing

The development of targeted interventions to combat child obesity will depend on a clearer understanding of how environmental influences on weight status are distributed across the socio-demographic landscape. (ANZJPH, April 2005 p 166)

Before we can combat child obesity we have to know more about the factors that cause children to get fat and the social and human issues that affect these factors.

Work this one out:

"Systems theory approaches focus on process level accounts of human behaviour and on the context dependence and heterogeneity of developmental phenomena. They are concerned with the equifinality and multifinality of development, the hierarchically embedded nature of intrapersonal (e.g. neurochemical activity, cognitive and emotional biases) and interpersonal systems (e.g. parent-child relationships; peer networks), and the mechanisms that underlie change (as well as stability) in normal and clinically significant trajectories".

More good news —tense in scientific writing

- Simple past tense for everything that has happened in the past. ie at least 90% of what you write
- Present tense for principles and "housekeeping"—ie, the rest

Repeating the good news about scientific writing

- If you ensure that you are precise, clear and brief, there are no other specific rules to worry about.
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Tense in Scientific Writing

The main aim of the experiment **is** to determine if there **is** a difference in productivity between plants selected for either high or low resistance to salinity, based on the growth rate, or high or low rate of photosynthesis using a strain of tulip plants that **has been bred** at the Horticultural Research Station over 8 years for a divergence in this trait. Productivity **will be** evaluated by measuring the number of flower heads per gram of bulbous tissue.

The two elements of successful scientific writing

- Structure
- Style

The structure of a good summary

Four essential parts

1. Why you did the work
2. How you did the work
3. The **main** thing(s) you found
4. Your **main** conclusion(s)
....and nothing else

Why you did the work

Or why the reader should be interested in why you did the work

If you frame this section so that it tells the reader what you expected to find before you did the work, you give the reader the best incentive to read on

How you did the work

The broad outline of your methodology in a maximum of two sentences

Readers are generally not interested in detailed methodology and, if they are, not until they have an idea of what you found. The detail comes in the body of the paper, not in the summary

You main result(s)

This is the result (or the results) that relate to the expectation that you announced in the "why"— did it turn out as expected or did it come as a surprise

....and no other results

Your main conclusion

This is the "take-home" message

....or the message you would like to be remembered for when the conference is over.

— Craft it carefully.

The Title

The most read part of your article (by about 100x)

It has two functions:

- To attract other scientists to read your paper
- To provide the best information possible to help search engines find your paper easily

Principles in preparing a good title.

1. Carefully choose the key words in your article (you will probably be asked by the editor to do this anyway)
2. Rank these key words in order of importance
3. Construct your title using *all* of the key words and trying, *as closely as you can*, to put them in rank order.
4. If the title is too long, drop off the least important key words first
5. Now, edit the title to try to give an indication of your main result or main conclusion (in other words, the real reason for writing the paper in the first place)

In other words:

Make sure that your title blurts out as much as possible of the research news that your article is going to talk about.

That's what makes readers want to read on

...because it stimulates their expectation

An example

Uninformative and dull

The effect of extracts from Australian plants on the levels of lactic acid in cattle

Based on the major result

Extracts from Australian native plants prevent lactic acidosis in cattle fed grain diets

Based on the major conclusion

Australian plants have the potential to replace antibiotics in the control of lactic acidosis in cattle.

Nutritional status and its associations in children under 5 years of age in EHP and Madang
Care-givers' practices and their potential to protect children under five in EHP and Madang from stunting

Tribal fighting, violence against women and girls and HIV in PNG.

Reducing violence against women and girls and, possibly HIV, in PNG by dealing with tribal fighting.

Style or Readability

- A characteristic of a piece of writing that makes it easy to follow and work out its meaning
- It is important to keep it constantly in mind so as not to upset the reader

Readability

Making sentences flow smoothly so that the reader is conscious of the message but not the way it is delivered.

...or

- getting rid of verbal stumbling blocks and
- making the way you write match the way a reader reads

Seven of the most common stumbling blocks in scientific writing

Stumbling Block 1
Noun clusters

- A large vehicle fleet operator mileage restriction has now been imposed
- Danish forest tree growth experiment designs require robust genetic evaluation
- Modern chemical effluent odour suppression compounds often lead to difficult piglet birth problems

A large vehicle fleet operator mileage restriction has now been imposed.

Interpretations:

A restriction has now been imposed on the mileage of operators of large fleets of vehicles

A restriction has now been imposed on the mileage of operators of fleets of large vehicles

A large restriction has now been imposed on mileage by the operators of fleets of vehicles

A restriction has now been imposed on large mileage by the operators of fleets of vehicles

A restriction has now been imposed on the mileage of large operators of fleets of vehicles

Soil nitrogen uptake

Uptake of nitrogen **from** the soil

Uptake of nitrogen **by** the soil

Examples of common English prepositions

- of
- to
- on
- in
- by
- for
- from
- with
- as

They are among the shortest words in the language. If you leave them out, you don't gain much in brevity but you lose a lot in clarity and precision.

The Lindsay Instant Buzzword Generator Kit

(All patents pending.)

Chromosome	Laser	Informatics
Nanotechnology	Therapy	Fast Reactor
Management	Probe	Cybergraphics
Computer	Aeronautics	Sustainability
Space Age	Logistics	Parameters
Super-power	Investigation	Nuclear Bonding
Planning	Internet	Biodiversity
Biotechnology	Creativity	Molecular Genetics
Development	Electronics	Bioinformatics
Stratosphere	Post doctorate	Radiation

Three ways of fixing the problem:

- Insert the missing prepositions
- Use an adjective
 - » Reproduction rate becomes reproductive rate
 - » New society problems becomes new social problems
- Hyphenate the words to show that they should be read as one
 - » Fine-wool sheep not fine wool sheep
 - » Free-range eggs not free range eggs

Stumbling Block 2
Complex adjectival phrases

The maximum net returns above clinical treatment cost strategy

The lower temperature without catalyst treatment

A separate previously ethics committee-approved DNA sample registry informed consent form

Fixing the problem

Use the extra words—mainly prepositions—to clarify the meaning.

The maximum net returns above clinical treatment cost strategy

becomes

The strategy that gives the maximum net returns above the cost of clinical treatment

Thus, although the poor attendance at the supermarket due to storms that day and the lack of subjects in the 60+ age group which forced us to confine our sampling to young consumers and despite the low temperatures throughout the whole period of the questionnaire,

Thus, although the poor attendance at the supermarket due to storms that day and the lack of subjects in the 60+ age group which forced us to confine our sampling to young consumers and despite the low temperatures throughout the whole period of the questionnaire, most people preferred ice cream to mushroom soup.

Fixing the problem

Put the main clause first

Although the results so far are for only a single ethnic group and the numbers are relatively small, laryngitis appears to be a consequence of too much talking,

becomes

Laryngitis appears to be a consequence of too much talking although the results so far are for only a single ethnic group and the numbers are relatively small.

Fixing the problem

While the industry recognises the importance of sustainable practices, it lacks the market drivers for growers to move to external certification.

The industry recognises the importance of sustainable practices but it lacks the market drivers for growers to move to external certification.

Stumbling block 4.
Nouns instead of verbs

- Weights [noun] of the children were taken.
- Low temperatures caused a reduction [noun] in the rate of the reaction.
- Recordings [noun] of farmers' responses were made.
- Temperatures showed an increase [noun] during the day.

Fixing the problem

Look at each noun in the sentence and see if there is a verb derived from the same stem. If so, simply use the verb to replace the noun

Stumbling block 4.
Nouns instead of verbs

Increases in ambient temperature resulted in a deterioration of the community's health status, particularly in regions where the treatment of the effluent ponds had not been carried out until the commencement of spring.

33 words

Stumbling block 4.
Nouns instead of verbs

When ambient temperature increased the community's health status deteriorated particularly in regions where the effluent ponds had not been treated until spring commenced

23 words

Stumbling block 4.
Nouns instead of verbs

An evaluation of the project was undertaken to determine the impact of the consultative process on participant capacity and management responses to dryland salinity (24 words)

The project was evaluated to determine the impact of the consultative process on participant capacity and management responses to dryland salinity (21 words)

The project was evaluated to determine how the consultative process affected the capacity of participants to manage dryland salinity (19 words)

Stumbling Block 6
Imprecise words

A { considerable
marked
substantial
significant
rather large } number of plants
responded to treatment

Etcetera

Fixing the problem

Give the exact number or a rounded version of it.

A considerable number of plants responded
becomes

Seventy-four per cent of plants responded,

or even, *About three-quarters of the plants responded.*
(remember that the rounded version would only be appropriate if the precise figure were given elsewhere, such as in an accompanying table or figure.)

Stumbling Block 6
Acronyms and abbreviations

FSH and LH were measured by RIA and E2 was extracted with RTC, purified by TLC and measured by CPB

Fixing the problem

- Whenever possible be frugal in your use of abbreviations and always be aware of their catastrophic impact on readability.
- If you aren't going to use an acronym more than three times in your article, write the expression out in full each time.

Stumbling Block 7
Citations, footnotes, asides, parentheses

The number of stomates per leaf may increase in geraniums (Brown 1937), decrease in petunias (Black 1978) or remain constant in sweet peas (White 1990) when manganese is deficient.
or
When manganese is deficient, the number of stomates per leaf may increase in geraniums, decrease in petunias, or remain constant in sweet peas (Brown 1937; Black 1978; White 1980).

Fixing the problem

- Avoid footnotes appendices and things in brackets whenever you can
- If the information is incidental to your main message, consider leaving it out altogether
- If it is important, incorporate it in the main message to show that it is important
- Position breaks for authors and dates where they will do least harm to the flow.

Two myths:

- Passive voice
- First person

Passive voice

Leaf samples were taken and the treatment group was observed for evidence of viral infection.

It is believed that, in this case, a "hands on" approach is better than a theoretical one.

Infringements will be incurred for not displaying a valid permit

Passive voice...

In conclusion, the subject of regularity in the action of the bowels is too important to be omitted. Constipation in infants, whether breast fed or bottle fed is extremely common. A healthy child, under one year, should have at least three actions in 24 hours. This is not generally realised, and very frequently a baby's bowels are regarded as regular if there is one motion in the 24 hours.

As to methods of remedying this: The best is that which consists in altering the diet to bring this result about, and thus if possible avoiding recourse to drugs etc. Constipation, however, *must* be put an end to, or the child's health will eventually suffer, to a greater or lesser degree. (121 words)

..changed to Active voice

We cannot ignore that children need to use their bowels regularly because they are often constipated whether fed from the breast or the bottle. A healthy child, under one year, should have at least three actions in 24 hours. Many people do not realise this and think that one action every 24 hours is regular enough.

The best remedy is for the mother to alter the diet and avoid drugs if possible. However, whatever the remedy she uses, she must end constipation or the child's health will suffer. (88 words)

First person

The present authors are in disagreement with Smurch *et al* (2007)

We disagree with Smurch *et al* (2007)

The farmers were visited and asked a series of questions

I visited the farmers and asked them a series of questions

Making the way you write match the way a reader reads

The principle

- Readers need to know what they are about to read
- If they do not, they read the sentence twice; once to find out what the sentence is about and second, to understand what is being said.
- If this happens too often the reader becomes tired of double reading and goes to sleep!

How to avoid sending the reader to sleep

- Begin each sentence with words that signal (in general terms) what is to follow in the rest of the sentence.
- The readers read (more or less) what they expect to find.
- The sentences then flow, one after the other, so the reader does not tire.

Two methods of using the beginning of the sentence to signal what is to follow

- Begin the sentence with something that was made clear in the previous sentence
- Use signaling words that act as sign posts for reading

A simple example of using reader expectation

The students were randomly selected and allocated to three treatment groups. A new piffometer with twice the speed of old instruments was used to determine the speed at which students learned to farnarkle.

The students were randomly selected and allocated to three treatment groups. These three groups were monitored for their speed of learning to farnarkle using a new piffometer with twice the resolution of old instruments.

Examples of "signpost" words

- In contrast, However
- In addition, Moreover
- There are three reasons, possibilities... First.. Second...Third
- Therefore, So, Thus
- Consequently, As a result,

These words always refer to points made in the previous sentence.

The main fat that we eat is the ester of long chain fatty acids and glycerol. The small intestine is the site of digestion and absorption of fat. Under normal conditions we do not excrete fat in the faeces because almost all of the fat that we eat is absorbed. Fat leaves the stomach as large droplets within an aqueous solution of chyme. If it remains in this form the water soluble lipase which digests it would have great difficulty in getting in contact with most of it. Bile salts can emulsify large droplets and break them down into smaller ones and the lipase can come in contact over a much larger area. Agitation within the duodenum helps break up the large droplets, the lipid part of the bile salt molecule dissolves in the fat and the electric charge on the polar part of its molecule faces outwards towards the aqueous phase of the mixture preventing the droplets from coalescing.

The main fat that we eat is the ester of long chain fatty acids and glycerol. We digest this fat in the small intestine and absorb it almost totally because we normally do not excrete fat in the faeces. When fat enters the small intestine from the stomach it is in the form of large droplets within an aqueous layer of chyme. The aqueous layer acts as a barrier to the water soluble enzyme, lipase, preventing it from contacting most of the fat and digesting it. So, the barrier must be broken down and this is done in three ways. First, large droplets are emulsified and broken down into smaller ones by the salts in bile which is secreted in the small intestine. The lipase can now come in contact with fat over a much larger area. Second, agitation within the small intestine helps break up the large droplets. Third, the bile salt molecule has a lipid part and a polar part that is electrically charged. The lipid part dissolves in the fat and the electrically charged part of its molecule faces outwards towards the aqueous phase of the mixture preventing the droplets from coalescing.

Final editing for style

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- Is the paragraphing right?
- Do the sentences flow?
- Are there road blocks?
- Can it be shortened without losing the meaning?
- Does it say what you want it to say?

Editing a paragraph

The Taskforce considers that there may be potential for significant air quality benefits from fuel ethanol use, emphasising that considerable uncertainty remains. Benefits cannot reasonably be costed at this time due to uncertainty, but the potential for these to be substantial in the context of ethanol's long-term fuel excise concession underscores the need for urgent scientific and technical research. There is prima facie evidence that there may be potential for significant reductions in fine particle emissions from the use of E10 in place of neat petrol.

86 words

Editing a paragraph for style

Do the sentences flow?

The Taskforce considers that there may be potential for significant air quality benefits from fuel ethanol use, emphasising that considerable uncertainty remains. Benefits cannot reasonably be costed at this time due to uncertainty, but the potential for these to be substantial in the context of ethanol's long-term fuel excise concession underscores the need for urgent scientific and technical research. There is prima facie evidence that there may be potential for significant reductions in fine particle emissions from the use of E10 in place of neat petrol.

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Editing a paragraph

Stumbling Blocks 1: Noun clusters

The Taskforce considers that there may be potential for significant air quality benefits from fuel ethanol use, emphasising that considerable uncertainty remains. Benefits cannot reasonably be costed at this time due to uncertainty, but the potential for these to be substantial in the context of ethanol's long-term fuel excise concession underscores the need for urgent scientific and technical research. There is prima facie evidence that there may be potential for significant reductions in fine particle emissions from the use of E10 in place of neat petrol.

Editing a paragraph

Stumbling Blocks 2: Flowery language

The Taskforce considers that there may be potential for significant air quality benefits from fuel ethanol use, emphasising that considerable uncertainty remains. Benefits cannot reasonably be costed at this time due to uncertainty, but the potential for these to be substantial in the context of ethanol's long-term fuel excise concession underscores the need for urgent scientific and technical research. There is prima facie evidence that there may be potential for significant reductions in fine particle emissions from the use of E10 in place of neat petrol.

Editing a paragraph

Stumbling blocks 3: Nouns that could be verbs

The Taskforce considers that there may be potential for significant air-quality benefits from fuel ethanol use, emphasising that considerable uncertainty remains. Benefits cannot reasonably be costed at this time due to uncertainty, but the potential for these to be substantial in the context of ethanol's long-term fuel-excite concession underscores the need for urgent scientific and technical research. There is prima facie evidence that there may be potential for significant reductions in fine-particle emissions from the use of E10 in place of neat petrol.

Editing a paragraph

Stumbling blocks 4: Acronyms

The Taskforce considers that there may be potential for significant air-quality benefits from fuel ethanol use, emphasising that considerable uncertainty remains. Benefits cannot reasonably be costed at this time due to uncertainty, but the potential for these to be substantial in the context of ethanol's long-term fuel-excite concession underscores the need for urgent scientific and technical research. There is prima facie evidence that there may be potential for significant reductions in fine-particle emissions from the use of E10 in place of neat petrol.

Editing a paragraph

The new version

The Taskforce considers that using ethanol in fuel may potentially improve air quality although we cannot yet be certain because we do not have the data to calculate the costs and benefits. For this calculation, we urgently need scientific and technical research. Benefits may be substantial because there is less fuel-excite on ethanol than on petrol and E10 may emit fewer fine particles than neat petrol.

65 words

Editing a paragraph

The original version

The Taskforce considers that there may be potential for significant air quality benefits from fuel ethanol use, emphasising that considerable uncertainty remains. Benefits cannot reasonably be costed at this time due to uncertainty, but the potential for these to be substantial in the context of ethanol's long-term fuel excite concession underscores the need for urgent scientific and technical research. There is prima facie evidence that there may be potential for significant reductions in fine particle emissions from the use of E10 in place of neat petrol.

86 words