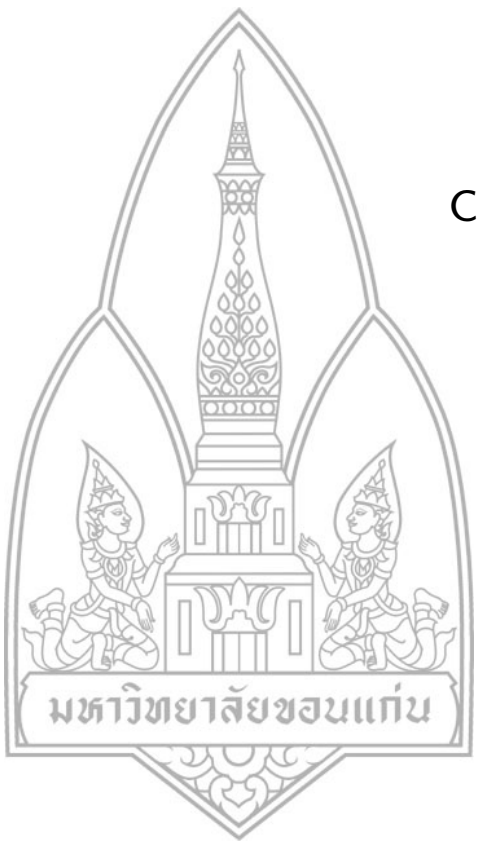
Biostatistics workshop series: Writing narrative



Dr Cameron Hurst
cphurst@gmail.com

CEU, ACRO and DAMASAC, Khon Kaen University

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What we will cover....

1. Introduction
   - What is meant by 'narrative'?
2. Clear writing and the four "C"s
3. Sections of manuscripts (and their role)
   - Introduction/background
   - Methods
   - Results
   - Discussion/implications/conclusions

Conventions

The conventions I will use:

Note:.....

Things to note will occur in a green box

Pitfalls:.....

Common mistakes and things to watch out for will occur in a red box

Defining narration

The word **narration** literaly means, "Voice of self" or "Voice of others". In other words, we think of a narrative a the "telling of a story".

We sometimes lose this feeling in reading (or writing) a scientific article, but we have to remember the human brain (and even that of a researcher) is still trying to look for a story

Health research and narrative

Obviously we are not writing a story (and basically our training steers us aways from thinking in this way) BUT

Our readers are humans (not machines) and humans naturally look for a narrative. Why? So they can piece together the main message and what it means to them. (another) BUT

We also need to consider who our researship are:

1. Technocrats
2. Practitioners (e.g. Medical doctors)
3. Epidemiologists
4. Those in control of policy formulation

The readership (audience)

Technocrats: These are often the 'basic science' researchers (e.g. Pre-clinical researchers in the health and medical sciences). They talk to each other, and have NO IDEA how to communicate with others (Try reading a paper in molecular biology one day if you want to know what I mean)

The Practioner: Best example (for us) is the medical doctor whose main interest is in how your work feeds into evidence based medicine. They tend to think in terms your works utility in clinical practice and for patient outcomes.

The readership (audience)

The epidemiologist: These peoples are (for most of you) the closest to your peers. However, epidemiologists who are asked to review manuscripts are generally experienced and understand research methods well. They will be trying to find weaknesses in your design and analytical approach. As an audience, they are most interested in the 'health science' of your work (Risk factors and their associations etc)

The policy formulator: These people will over have control over the implementation of your finding (if they are impressed). To impress them, the last section of your discussion (recommendations) will have to be impressive, and lend themsleves to implementable interventions.

The four C's of scientific narrative

In scientific writing people will ofetn mention the 3 (or 4) C's. These are

1. **C**lear
2. **C**oncise
3. **C**omprehensible
4. **C**ompelling

Sentence structure

Hint: Being Clear and Succint

- EVERY WORD COSTS 30 BAHT!!!!
- Remember we are not wrting a novel. If you try to impress people with 'big and flashy' words, you will find your message gets lost.....KEEP IT SIMPLE
- Avoid long sentences (by the time the reader gets to the end s/he will forget what the sentence was about)
- BUT don't make your sentences too short (this gives a 'JERKY' feel to the writing)

Active vs passive voice

In scientific prose, we should remember to write in the active 'voice' (verb dominated) rather than the passive voice (noun dominated)

Active voice:

Smith et al.(2012) **investigated** the effect of smoking on patients **acheiving** clinical coutcomes...

Passive voice:

The effect of smoking on the **achievement** of clinical outcomes by patients was considered in an **investigation** by Smith et al. (2012)

Verbs and nominalization

Nominalization is the coversion of a verb to it's 'noun' form.

This should be avoided

Verb	Nominalization
Analyze	Analysis
Predict	Prediction
Investigate	Investigation
Demonstrate	Demonstration
Explore	Exploration

Warning: Avoiding nominalization

Words that end in "-ation" are ususally nominalizations of verbs. Generally avoid them (they will be more expensive in words).

Editing your own work

Go through your manuscript and underline every word that ends in "-ation", can you change the sentence to the active voice?

Clear writing

Keep subjects (nouns) near their verbs (actions)

Right:

Smith et al.(2012) **investigated** the **effect of smoking on patients acheiving clinical coutcomes**...

Wrong:

Patient achievement of clinical outcomes was investigated by Smith et al. (2012) where the main focus was on the effect of smoking.

Structuring paragraphs

The first hint to writing a good **paragraph** is:

Hint:

Make sure the first and last sentences of a paragraph match.

A bad paragraph

I like cats. Cats were first domesticated in Mesopotamia, 10000 years ago. Mesopatamia literatelly means 'the land in two rivers' in Latin. Latin was the langauage of the Romans.

Even though all the sentences link (good cohesion), the first and last setences are unrelated.

Editing your own work

1. Does the last sentence's topic match the first sentence's topic?
2. Does every sentence in the paragraph relate to the first (topic) sentence?

Structuring paragraphs

Old information should occur **before** new information.
Most readers will find your writing more clear if you consistently begin sentences with familiar (old) information and conclude sentences with unfamiliar (new) information.

Pitfall:

If you present your new information (in a sentence) first, the reader will often try to link it to the previous sentence, rather than reading on to complete the sentence

Editing your own work

Go through and highlight any new information in a sentence. Does it occur before or after the old information. If before, you will need to change this.

Example:

In the following sentence, new information is highlighted in **red** and old in **blue**

Farmers try to provide optimal growing conditions *for crops by using* **soil additives to adjust soil pH**. **Garden lime, or agricultural limestone**, *is made from pulverized chalk, and can be used to* **raise the pH of the soil**. **Clay soil**, *which is naturally acidic, often requires addition of* **agricultural lime**.

First sentence fine, but following two present new information before old information. Restructing the paragraph...

Example:

Rem: **Old** and **New**

Farmers try to provide optimal growing conditions *for crops by using* **soil additives to adjust soil pH**. *One way to* **raise the pH of the soil** *is an additive made from pulverized chalk called* **garden lime or agricultural limestone**. **Agricultural limestone** *is often added to naturally acidic soils, such as* **clay soil**.

The importance of an outline

- Many (especially inexperineced) researchers will just sit down and start writing their manuscript (or thesis).
- GUESS WHAT: It shows
- How does it show: Inconsisencies, dead ends, convoluted explanations and jumping backwards and forwards
- The downstream effect is a confusing, badly structure argument.
- What do you think a reviewer/examiner will do with such a manuscript/thesis???.....WORSE: WHAT WILL YOUR ADVISOR SAY????

Warning:

Take home message: Please, please **PLEASE** start with an outline!!!!!

How to write an outline: sign-posting

- Section headings
  - Subsection headings
    - Dot point for each paragraph (or main point)

  By doing this, we can (re)arrange our story, so we can present a well structured, flowing article.

One section at a time

Another good idea is to **write one section at a time**.

For example, the objectives of the **Introduction** and the **Methods** section are totally different. Write the Intro (or Methods) section first, then only when you are quite happy with it, move onto the next section. If you do this, you will find the quality of your manuscript to be MUCH better.

Where should you start? Depends on who you are, and the type of study. As a boistatitsician I always start with the Methods and Results, and only then go back to the Intro and DIscusion. However, many of you (having done a throrough review of the literature), will often start with the introduction.

Sections of manuscripts

I know we have covered this MANY times, but it is such an important aspect, I would like to cover it again. Typically a manuscript is divided into four sections (excluding the abstract)

1. Introduction
2. Methods
3. Results
4. Discussion

Role of the Intro/background

- Like any research article, there has to be a justification for doing the research
- Reviewers are busy people, and an author needs to mydgpull them in with their problem statement
- The introductory statements are the first thing the reviewers sees. If we can't capture their interest here, we have lost them
- An author needed to impress on the reviewer the **WOW** factor (COMPELLING)

Role of the Introduction

There are three main ingedients in an introduction:

1. Background statement
2. Knowledge gap
3. Research objective

Role of the methods section (in a paper)

Goods research is about scientific replicability. We should be able to see all the details in the methods section needed to (almost exactly) repeat the study. Typically a methods section will be split up into different parts (with or without sub headings):

1. Target (or Study) Population
2. Participants and study design (including sampling approach)
3. Measurement procedures and/or variables collected (including outcome, study effect and covariates variables considered)
4. (if prospective) Sample size calculations
5. Statistical analysis

If we can't replicate the study exactly from the methods section, it is not acceptable. If the study is experimental we should be able to extract the PICO/PICOT from this section alone

Results sections in manuscripts

DOs

- Start off with a brief presentation of sample statistics that can be for the group as a whole, and/or between the main groups (e.g. Treatment or exposure group):
  - For RCTs this is about showing confounders are balanced
  - For observational studies, show statistics for group as a whole, and then split according to study effect (to show 'other' potential independant risk factors and confounders)
- Section for figures and tables and a very succint interpretation of the results from these 'statistical outputs'

The results section

DON'Ts

- Avoid linking the results from different analyses
- Never mention result implications (especially in terms of findings of others)
- Never introduce methods here (not mentioned in the methods section)

Discussions/implications/conclusions

The discussion is where you:

1. Reiterate your main findings
2. Tie these findings in with the literature (agree/disagree)
3. Talk about the strengths and limtations of your study
4. (If relevant) talk about how your findings may feed into (Policy, clinical practice, or future research)
5. Again, reiterate you main findings

Narrative and the Scientific Manuscripts

Clearly, writing a scientific paper is not the same as wrting a story and all of our training has taught us to be sophisticated experts, so why can't we just write it the way our sophisticated brains tell us to?? Two reasons.

1. We are VERY familar with our project (and the reader isn't) so we have to make it AS SIMPLE AS POSSIBLE for the reader to quickly grasp the message we are trying to convey.
2. Human brains like a story. For most of our history as a species (with the ability to speak) we have gain knowldge through the story. History and knowledge was passed down orally (sitting around a fire). It has only been a 20-30 centries (out of a few hundred) where knoweldge has been passed down through the written word.

Let's write a manuscript: Introduction

Introduction: Once upon a time,

- .... there was a problem, a big problem
- Other people had tried to solve the problem, but this was a slightly different problem (e.g. Western populations)
- Before going further, let me tell you a little bit more about the problem (this is detailed research....if it was well understood it wouldn't need to be done)
- So (now that you understand the context), this is the specific (aspect of the) problem I am going to address (try to solve)

Let's write a manuscript: Methods

Methods:

- Let me tell you how I went about trying to solve the problem (so you can do it too, if you like)
- This is the people I consider (target population)
- Here is how I collected a group of them together (sampling, exclusion/inclusion criteria)
- Here are the things I measured from them
- This is how I put it all together (to try and answer the question)

Let's write a manuscript: Results and discussion

Results: This is (exactly) what I found (without too much context)

Discussion:

- These are the important things I found
- This is how it agrees/disagrees with other people (who have tried to consider the same or a similar problem)
- This is what I could have done better (limitations)....for next time
- This is what I did really well (strengths)....and important findings
- (Everything said and done), this is what I achieved....I solved the problem, and this is how it can be used (clinical practice, design of interventions, policy formulation etc)

....and we all lived happily ever after.

Concluding remarks

- Remember your audience
- Start with an outline (PLEASE!!!!!)...will save you lots of time in the end
- Only after we are happy with the outline, should we start to sit down and write sections.
- Do this one section at a time (REMEMBERING THE ROLE OF THAT SECTION) start to write
- Using the principles of a good sentences (clear and concise) and paragraph (cohesive and consitent)
- KEEP IT SIMPLE (KISS)
- Get your friends (and enemies) to review your work. It is better than upsetting your advisor or reviewers.

A trick: One thing I used to do: In the old days (starting out) is writing powerpoints presentation before I wrote the manuscript. Maybe this is because I taught for a few years before I wrote, but this really worked for me.

PEP talk

- First 5 MSs (**HURT**)
- 6-10 (still a little **uncomfortable: mai khoy sabai**)
- >10....EASY: you won't understand why you ever found it hard

THANK-YOU!!

Questions??