“How To Write An Abstract”

Summer 2023

Importance of the Abstract

- Purpose of an abstract:
  - To help readers decide whether or not they want to read the full paper.
  - Abstracts are often published separately in outlets such as Web sites or secondary and indexing journals.
- It is often the only part of your work that will be read.
  - Sometimes only the abstract is available.
  - The reader may be in a hurry.

Content of an Abstract

- Everything that is important in the paper must be reflected in the abstract; it is the paper in miniature.
- Flow and outline should roughly match the paper:
  1. Introduction
  2. Materials / Methods
  3. Results
  4. Discussion
  5. Conclusion
  - (But! These headings will not actually occur in the abstract)
- Succinct writing is absolutely critical.

The Title

- Thousands of people will read a title, but fewer will actually go on to read the paper.
- Title should represent the contents of the paper as accurately and concisely as possible.
- For a scientific paper, don't use cute, poetic, or otherwise overly stylized titles.
- A good title will include significant key words and suggest the focus (and even conclusions) of the paper.

The Title, con't….Which one is better?

- *"Famers Dig Into Soil Quality: Analytical Technique Promises to Match Fertilizers to Soil in Bid to Boost Yields."*
- *"Feline Leukemia Virus Requires a Post-Receptor Binding Envelope-Dependent Cellular Component."*

Prose – The Nuts and Bolts of Writing

- Don't try to be literary or overly clever. Clear, direct, unambiguous and forceful writing is appropriate for scientific communication.
- Re-read your text as if it were written by somebody else and ask yourself.
  - Is the language clear?
  - Does it read smoothly?
  - Is it as short and direct as possible? (No redundancies!)
  - Does it read like English? (e.g., does it use English constructions?)
  - Use spell and grammar check.
  - Be careful with your verb tenses.
  - Be purposeful and consistent with active/passive voice.

Style Points

- Should not contain citations unless they are absolutely necessary to understand the work.
- Should not include detailed reasoning.
- Choose either active or passive voice and be consistent throughout the abstract. Passive is okay. Do not refer to the authors in the 3rd person. Say "I" or "we" if you are using active voice.
- Avoid unnecessary phrases, instead keep it simple
  - "The results show…"
  - "The analysis reveals…"

Four Sample Sections

(Rank them, and identify the primary flaw in all but the strongest)

A. In my opinion, it seems to me that college football should be abolished. The reason why I think this to be true is because college football is bad in nearly every respect. As Robert Hutchins has said, it would be better and just as logical if the colleges had horse races. I firmly agree that this point is true, and as my research shows…

B. The lizard beetles of the tribe Languriini constitute a moderately diversified taxon, consisting of hundreds of species worldwide, and have been reported to feed primarily on plant matter. Adult females of the lizard beetle *Doubledaya bucculenta*, which is endemic to Japan, have a large asymmetric head with enlarged mandibles and elongated forelegs. In spring, they excavate a small hole on a recently-dead stem of *Pleioblastus* and *Semiarundinaria* bamboos, lay an egg into the cavity, and plug the hole with bamboo fiber. We found that…

C. But what becomes most interesting is the departure from the Joycean epiphany in the later stages of his oeuvre. Gone is the notion of the "quidditas," and gone too are the other trappings of modernity (and pure realism before it). Indeed, as many scholars have illustrated, by this stage a postmodern fascination with the very quotidian nature of the sentence itself has completely subsumed the notion of character and characterization.

D. But seriously – these fish are out there eating like a million flies. By the end of the study, there were only maybe four or five left. And cause of this, we knew that these fish *would* eat em all, if they could. (They were like nom nom nom - LOL!)

Let’s look at some other abstracts….

From "Experimental Evaluation of Shark Detection Rates by Aerial Observers"

William D. Robbins, Victor M. Peddemors, Steven J. Kennelly, and Matthew C. Ives

Introduction

Aerial surveys using helicopter and fixed-wing aircraft have been used to estimate the presence and abundance of terrestrial and marine animals for many years. Terrestrial surveys have focused on large quadrupeds such as moose, oryx, elk, deer, horses and zebras [1–6], although abundances of smaller animals such as kangaroos, goats, emus and smaller birds have also been assessed [7–11]. Numerous factors affect the ability of observers to sight terrestrial species, including group size, individual activity and the frequency at which animals are obscured by vegetation [4,12,13]. Although not affected by many of the factors involved in terrestrial aerial surveys, aerial sighting rates of marine animals are influenced by their own suite of environmental and biological factors. Water turbidity, wind strength and sea chop can all reduce sighting rates [14,15], as can the size and behaviour of the animals. Marine aerial surveys have generally focused on the abundance of air-breathing animals, such as bottlenose dolphins, right whales, sea lions, harbour seals, dugongs and turtles [16–22]. Sightings of such species are easier than for submerged species like sharks, because they spend at least some time on the surface [14]. Sighting animals as they surface to breathe reduces the obscuring effects of turbidity, and creates additional sighting cues such as a high contrast wake as individuals break the surface. This effect is enhanced when surveying species such as dolphins travelling in pods, where thousands of individuals may be present in a single group [23].

Targeted aerial surveys of sharks have focused mostly on very large (>10 m) species, such as whale sharks (Rhincodon typus) and basking sharks (Cetorhinus maximus) [24–27]. These species frequent the surface for feeding and courtship [28,29], allowing groups of individuals to be readily detected. However, most shark species are much smaller, generally do not form aggregations, and spend much of their time below the surface of the water [30,31]. This makes them a difficult target for aerial observers to detect and identify. While smaller shark species such as blue sharks (Prionace glauca) and hammerhead sharks (Sphyrna spp) have been recorded in published aerial surveys [32], sharks are generally absent or are reported in low numbers in aerial marine surveys [23].

Aerial shark detection for public safety occurs in Australia using both helicopters and fixed-wing aircraft. Although these aerial beach patrols are not formal surveys for quantifying the abundances of sharks, their role as a means for protecting swimmers from attack means they should ideally detect a high proportion of sharks present in the area overflown. Australian aerial patrols survey large expanses of beach, receive considerable public support as a perceived form of protection against shark attack and resulting shark sightings often receive considerable media attention. However, because potentially dangerous coastal sharks such as white sharks and tiger sharks may spend much of their time close to the substratum [30,33], the reported sightings from aerial surveillance may represent only a small proportion of the sharks actually present.

As part of a process to review the suitability of aerial beach patrols in NSW we undertook a structured assessment of shark sighting rates by observers in both helicopters and fixed-wing aircraft, using comparable conditions (speed, altitude and cockpit configuration) to those employed during aerial beach patrols. As the real-time tracking of live sharks was logistically impractical, we assessed aerial sighting effectiveness using life-sized plywood shark analogues. Artificial animal analogues have been successfully used to calibrate previous marine surveys [15] and allowed us to control the depth and spatial distribution of potential sightings while providing a realistic visual image for aircrew observers. We initially assessed the depths at which the shark analogues were sighted by fixed-wing and helicopter observers and, using this information, investigated the effects of aircraft distance and environmental variability on sighting rates.

Materials and Methods

The study was carried out at the northern side of Jervis Bay, NSW (35.0167uS, 150.7311uE). This is a large embayment…

The Abstract

- Aerial surveys are a recognized technique to identify the presence and abundance of marine animals. However, the capability of aerial observers to reliably sight coastal sharks has not been previously assessed, nor have differences in sighting rates between aircraft types been examined. In this study we investigated the ability of observers in fixed-wing and helicopter aircraft to sight 2.5 m artificial shark analogues placed at known depths and positions. Initial tests revealed that the shark analogues could only be detected at shallow depths, averaging only 2.5 m and 2.7 m below the water surface for observers in fixed-wing and helicopter aircraft, respectively. We then deployed analogues at shallower depths along a 5 km long grid, and assessed their sightability to aircraft observers through a series of transects flown within 500 m. Analogues were seen infrequently from all distances, with overall sighting rates of only 12.5% and 17.1% for fixed-wing and helicopter observers, respectively. Although helicopter observers had consistently higher success rates of sighting analogues within 250 m of their flight path, neither aircraft observers sighted more than 9% of analogues deployed over 300 m from their flight paths. Modelling of sighting rates against environmental and experimental variables indicated that observations were affected by distance, aircraft type, sun glare and sea conditions, while the range of water turbidities observed had no effect. We conclude that aerial observers have limited ability to detect the presence of submerged animals such as sharks, particularly when the sharks are deeper than ~2.6 m, or over 300 m distant from the aircraft's flight path, especially during sunny or windy days. The low rates of detections found in this study cast serious doubts on the use of aerial beach patrols as an effective early-warning system to prevent shark attacks.

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Where are the different parts of this abstract?

- Introduction
- Materials and Methods
- Results
- Discussion and Conclusion

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How to Prepare Your Abstract

- Write your abstract – review it – ask a peer to read it
- Send your abstract to all of your co-authors with time for them to review and provide edits/feedback to you. Track changes in MS Word works great.
- For "Co-Authors," include those you've worked with closely, who've been directly involved in your work.
  - Grad student who assisted with your experiments? Yes.
  - IT person who fixed your laptop? No.
  - If their name(s) will be on the poster, they should be listed as a co-author and have a chance to review your abstract.
- Note that you may well not have all your results and conclusions yet. This is fine. You can include any preliminary results or anticipated results.

How to Submit Your Abstract for the August 4th Poster Session (Deadline Is July 21, 2023)

- https://summerresearch.wsu.edu/poster-symposium/
- Click "Summer Research Poster Symposium"
- Click "Submit Your Abstract" at the top and enter your information. Type carefully and proofread closely.
- For "Other Collaborators/Co-Authors," include those you've worked with closely, who've been directly involved in your work.
- Note: an email will be automatically sent to your program director when you submit the abstract
- Feel free to email UG.Research@wsu.edu with any technical questions about the submission form.
- Email your research mentors with questions like:
  - Should Mary the lab assistant be a co-author?
  - Should we mention the results of the test that failed?

Questions?

- Look at previous abstract books online here

https://summerresearch.wsu.edu/previous-experiences/