Intro to Abstracts

Adapted from Sarah Burcon, Ph.D.

The purpose of an abstract is to:

give a clear indication of the **project objective, scope, approach and results** of the paper so that readers may determine whether the full text will be of particular interest to them. The abstract should not attempt to condense the whole subject matter into a few words for quick reading.

provide **key words and phrases** for indexing, abstracting, and retrieval purposes. Keywords should be included on a separate line at the end of the abstract text.

The abstract should be one paragraph and should be no more than 250 words.

Abstracts act as "snapshots" of research papers or "previews" of conference papers.

Abstracts entice prospective "customers" (or not!)

Swales and Feak distinguish between Research Paper (RP) Abstracts and Conference Paper (CP) Abstracts in their research into different types of writing.

You'll be writing a RP Abstract, but we will discuss both here, for context.

Note: in some fields, the terms "precis" or "synopsis" are used instead.

Essential Characteristics: Research Paper Abstracts

- They must be highly condensed (typically 100 – 500 words) AND they are attached to the completed paper.
- They must capture the main information from at least two of the four IMRaD (Introduction/Methods/Results/Discussion) sections.
    - Some are exclusively "indicative" (i.e., they include I and M only)
    - Some are "informative" (i.e., they include R and D also)
- They can be structured (with headings) or unstructured (without headings).

Essential Characteristics: Conference Paper Abstracts

- They are typically less condensed than Research Paper abstracts, and they are (typically) independent from the paper.
- They may be less informative than RP abstracts
  - The paper may not exist yet
  - Completed results usually aren't available
  - They typically focus on the I, M, and the value of the projected R

Five Rhetorical Moves in Abstracts

- John Swales and Christine Feak (and other researchers) identify a potential total of five **rhetorical moves** (communicative stages) in research abstracts in various fields.
  Note: all five moves are not necessarily always present in an abstract.

- They suggest that Moves 2 and 4 are most common, while Move 5 is the least common.

The following information on abstracts has been adapted from: Swales, John M. and Christine B. Feak. *Abstracts and the Writing of Abstracts*. Ann Arbor: U of M Press, 2009.

Rhetorical Moves in Abstracts

Move #	Typical labels	Implied questions
Move 1	Background/introduction/situation	What do we know about the topic? Why is the topic important?
Move 2	Present research/purpose	What is this study about?
Move 3	Methods/materials/subjects/procedures	How was it done?
Move 4	Results/findings	What was discovered?
Move 5	Discussion/conclusion/implications/recommendations	What do the findings mean?

Four basic types of opening sentences for abstracts

Type A: Starting with a Real-World Phenomenon or with Standard Practice
For example: Economists have long been interested in the relationship between corporate taxation and corporate strategy.

Type B: Starting with Purpose or Objective
For example: The aim of this study is to examine the effects of the recent change in corporate taxation.

Type C: Starting with Present Researcher Action
For example: We analyze corporate taxation returns before and after the introduction of the new tax rules.

Type D: Starting with a Problem or an Uncertainty
For example: The relationship between corporate taxation and corporate strategy remain unclear.

Compressing Methods Descriptions: Move 3

- Move 3 can include information about data, length of study, etc.; therefore, a lot of information needs to fit into a small space.
- In general, methods (in abstracts) are likely to use past tense and passive voice.

Please read the following. This 50-word section needs to be reduced because the entire abstract could only be 100 words.

The primary data used consist of approximately 300 memoranda (internal correspondence) and 150 fax messages (external correspondence) associated with four different Turkish companies selected to represent a range of sectors, sizes and management styles. Analysis of the primary data was supported by interviews with executives from these four companies. (50 words)

Compressing Methods Descriptions: Move 3

Original: The primary data used consist of approximately 300 memoranda (internal correspondence) and 150 fax messages (external correspondence) associated with four different Turkish companies selected to represent a range of sectors, sizes and management styles. Analysis of the primary data was supported by interviews with executives from these four companies.

Version 1

- The primary data consist of internal and external correspondence (faxes) from four very different Turkish companies. Secondary data comes from interviews with selected executives. (24 words)

Version 2

- The main data consist of 300 memoranda and 150 faxes associated with four Turkish companies representing a range of different types of enterprise. (22 words)

Version 3

- Internal memoranda and external faxes were collected from four Turkish companies of varying sizes. This primary data were supported by secondary interviews. (22 words)

Which do you think is best, and why?

Writing the Results in Abstracts: Move 4

Swales and Feak put forward two questions:

1. How do you organize your findings? Do you first talk about results in general? Do you then provide specific information about your findings?
2. Do you use precise numbers and percentages in your abstract, or is it better to provide an approximation of your results?

They found that, across disciplines, the tendency was:

1) to present the general results first, followed by specifics, and
2) to provide exact numbers and exact statistical data.

Concluding an Abstract: Move 5

Eighteen out of 25 abstracts from 2006 issues of *Computer Modeling in Engineering and Science (CMES)* appeared to have definite and upbeat conclusions, often stressing the utility of the reported results. For example:

- The algorithm developed by...is found to be a robust, fast, and efficient method for detecting...
- Some numerical examples are given to demonstrate the power and scope of the method.
- The accuracy and efficiency of...approach was verified by analyzing the...

Swales and Feak suggest the following "moves" for conference abstracts*

Move 1	**Outlining/promoting/problematizing the research field or topic**
Move 2	Justifying this particular piece of research/study
Move 3	Methodological, demographic, or procedural comments
Move 4	Summarizing the main findings
Move 5	Highlighting its outcome/results
Move 6	Further observations (implications, limitations, future developments)

*The extra move is because CAs need to make a strong appeal to review committees.

EXAMPLE ABSTRACT

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While collaboration has always played an important role in scientific research, information technology has introduced new opportunities for collaborative research. [2] In particular, collaboratories, which use computer networks to facilitate scientists' access to remote instruments, to remote colleagues, and to archived data, represent a novel environment for scientific collaboration. [3] By diminishing the importance of physical proximity, collaboratories provide a technological basis for new forms of networks of scholars (Wellman, 2002). [4] Based on previous studies of information technology use and on the social networks of scientists, it is here hypothesized that collaboratory use may extend network range. [5] One likely pathway for this is by generating more opportunities for junior scientists and those employed by non-doctoral institutions to become inter-connected in ways comparable to the networks of senior scientists at elite institutions. [6] On the basis of a survey of space scientists and on an examination of co-authorship relations among those scientists from 1993 to 1996, this longitudinal study compares space scientists' social network structure before and after they adopted the Upper Atmospheric Research Collaboratory in order to examine its impact on their scientific work. [7] Results of this research indicate that collaboratory use has led to an increase in the network range of the aerospace science community. [8] More specifically, junior scientists and peripheral institutes have become more connected to the senior scientists and elite institutes. [9] The paper closes by discussing whether the space science collaboratory is typical of others or has distinctively predisposing collaborative features. [249 words]

Move 1: Background/intro/ problematization)
Sentences 1-3

Move 2:
Present research/purpose
Sentences 4-5

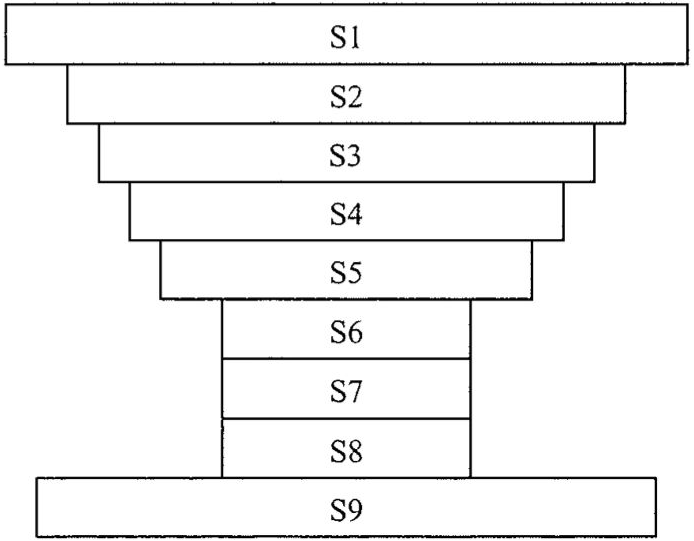
Move 3:
Methods/materials/procedures
Sentence 6

Move 4:
Results/findings
Sentences 7-8

Move 5:
Highlighting the results
N/A

Move 6:
Implications/limitations, etc.
Sentence 9

The content of this abstract has a ‘shape’:
it narrows as it moves from background to topic to results, and then widens in the final sentence.
Note: we’ll see this later in the discussion of the paper.



Writing about your Approach (Methods)

Approach subsection: 3rd level heading

Issues?

Testing Procedure: The static test was conducted with steady deflection on the beam and no vibration to help determine the relationship between damping ratio and length. The test involved hanging five different masses on seven different cantilever beam lengths using a LabVIEW 2015 program "Vibrating Beam cDAQ.vi" to take strain measurements at 2000 Hz for each test. Once the beam is clamped, calibrate and null the strain gauge using the LabVIEW program and hang a weight ranging from 10 to 200 grams. When the weight is steady and no longer swinging, start the LabVIEW 2015 program and let it run for 5 seconds.

Recall:

- *Organized for skimmability:* Sub-headings are precise and concise, and topic sentences are appropriate to each subsection.
- *Language* is in narrative form, and is clear, concise, and professional.
- *Type of data recorded should include sufficient information.* Equipment descriptions should include (where appropriate) make and model number/software version number, associated uncertainties, number of measurements taken, and the type of data recorded.
- *Test descriptions* should state steps taken from beginning to end, at the appropriate "level" (enough detail that a knowledgeable reader can assess the appropriateness of the methods, not information that can be assumed).

Use figures and tables to support your claim.

Tensile Test. The number of pixels *npixels* across the width of each specimen was 330. A summary the measurements taken for gauge width (*W gauge*), cross-sectional area (*A*), and calculated pixel size (*dpixel*) for each tensile test can be seen in Table 1 below. In addition, the nominal stress-strain curve obtained from the tensile test can be seen in Fig. 2.A in the Elastic Modulus section.

Table 1. Summary of naval brass dogbone specimen measurements and resulting pixel size prior to tensile test.

Specimen #	W_{gauge} [m] ÷ 10^2	A [m²] ÷ 10^4	d_{pixel} [m] ÷ 10^5
5	1.64 ± 0.00	1.05 ± 0.00	4.98
6	1.64 ± 0.00	1.05 ± 0.01	4.98
8	1.63 ± 0.02	1.03 ± 0.03	4.95

Elastic Modulus. The elastic portion of the true stress-strain curve used to obtain Young's modulus can be seen in Fig. 2.B below.

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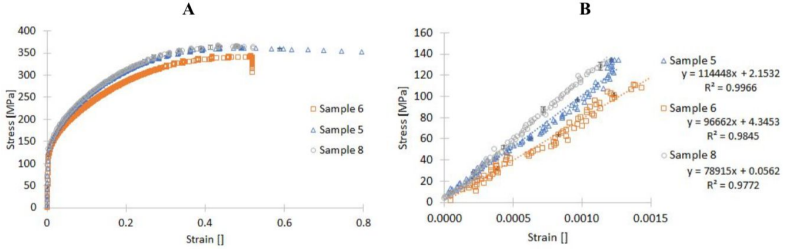

Figure 2. Nominal stress-strain curve obtained from the tensile test (A) and graph used to obtain Young's modulus (B). Error bars on both graphs are present but small and difficult to distinguish. From Graph B, Young's modulus was determined to be 88 ± 24 GPa.

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Use figures and tables to support your claim

Reference to visual

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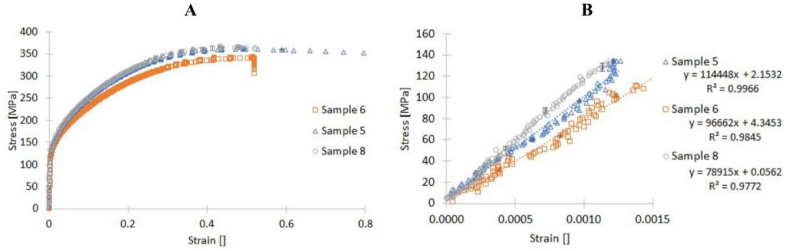

Caption with conclusion

Figure 2. Nominal stress-strain curve obtained from the tensile test (A) and graph used to obtain Young's modulus (B). Error bars on both graphs are present but small and difficult to distinguish. From Graph B, Young's modulus was determined to be 88 ± 24 GPa.

Explanatory text would follow.

General Guidelines

- Introduce figures and tables in text prior to their appearance
- Use the same language across sections
- Make sure variables, titles, labels are consistent and clear
- Refer back to equations, figures, sections by name or number
- Use connecting language to ensure that ties between activities/sections can be understood

What is the *first* thing you want your reader to know?

- Figure 1 shows that temperature increases proportionally to increases in pressure.
- Temperature increases proportionally to increases in pressure (Figure 1).