Lecture 3: Reading and the discourse of the abstract

Reading Skills and the Discourse of the Technical Research Article (RDRA)
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Writer’s Purpose in abstracts

- To provide a highly condensed version of two main aspects of the research
  - The kind of research reported in the RA
    - informative
  - The contribution the research makes to the field
    - persuasive

Writer’s Purpose and Audience

- The writer selects and formulates information for (a part of) the journal readership, for example:
  - Academic researchers
  - Industrial researchers
  - Readers interested in theory / applications / methods development…
  - A mixed audience, for example:
    - Both academic and industrial researchers
    - Analytical chemists and environmentalists

Readers Purpose

- To quickly determine:
  - the kind of research reported issues treated, applies or develops methods, models, approaches, etc.
  - what is claimed as novel and significant
- To predict whether aspects of the research would be of interest for their research

Readers’ Purpose and audience

- To determine who the intended audience is
  - in order to predict:
    - what aspects will be of main importance
    - what sort of background will probably be provided
    - what sort of background is probably assumed
ORGANIZATION OF ABSTRACTS

The Abstract Organization
- Four main topics (types of information)
  - The problem investigated (I)
  - The means used or developed to deal with the problem, e.g., method; model, approach, device, design or theory (MADT) (M)
  - The original outcomes produced, e.g., findings, results, insights or innovations (R)
  - The main implications or significance of the reported research (D)

Abstract Moves and steps
Tools for analyzing purpose

The Organization of the Four Main Topics
- Typically order:
  - I+M+R+D
  - A mirror of the sections
- Common variation (cycling):
  - I+M+R+M+R+D
  - I+M+R+D+R+D

Moves
- Units of language
  - used to carry out purpose:
    - the persuasive intent of language and information

Reading skills (using co-text):
Predicting from the four main topics
- Using co-text:
  - Awareness of the 4 main topics and their typical order, you can often predict:
    - what the authors consider:
      - the most important sections in an RA
      - the most important aspect(s) in each section
    - which sections might be most interesting for your own research

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MOVES:
Author Purpose in the four parts of Abstracts

- (I) Topic: The problem investigated
  - (I-Move) Purpose: to show the interest of investigating the problem
- (M) Topic: The means used or developed to deal with the problem
  - (M-Move) Purpose: to show that a valid (or possibly superior or novel) means was used

Common Author Purpose in Abstracts

- (R) Topic: The original outcomes produced, e.g., findings, results, analysis, insights or innovations
  - (R-Move) Purpose: to show viable and interesting novel outcomes were achieved
- (D) Topic: The main implications or significance of the reported research
  - (D-Move) Purpose: to show that the outcomes contribute to important accepted goals and directions of the field

Abstract Moves and Steps
The I-Move and common steps

Common steps in the I-Move

- Common ways to show that the problem is of interest
  - Provide background or give an overview of the problem studied (Background)
  - Claim centrality for the problem (Centrality Claim)
  - Describe objectives (Objectives)
  - Preview the results (Results Preview)
  - Describe the scope (Scope)

Moves and Steps

Steps =

- Typical means used to carry out the moves

I-Move: Background step

- Factual or conceptual information about the general area and/or problem investigated

- Communicative aspects:
  - Typical when the intended AUDIENCE are UNFAMILIAR with (aspects of) the research problem
In Scotland, the government is committed to restoring the natural woodland ecosystem of mountain areas and gives payments to landowners for establishing new woodlands. (Factual background)

Although the aim of the policy is to restore a natural woodland ecosystem, the rate of payment available is correlated with the costs of establishment rather than the contribution new woodlands make to restoring the natural ecosystem. (Claiming there is a real-world problem)

The aim of this study was to investigate whether human basophils function as APC for the major birch pollen allergen Bet v 1. (objective)

Ecosystem restoration has emerged as an important approach to safe-guarding biodiversity. (Claim of the importance of the research area)
I-Move: Results Preview step

- **Results** = The major outcome(s) that the research did in fact accomplish

- **Communicative aspects**
  - May be used when results are important/easily described in a brief sentence or phrase
  - It is a common convention in the field to state the result early

  Check the conventions in your field

Sample language:

**steps in I-Move**

The effectiveness of disodium octaborate tetrahydrate (DOT) as a treatment chemical for Sitka spruce in Britain was tested using…

(Scope) (the only I-Move step, i.e., the 1st ½ of 1st sentence)

In this study, the cost-effectiveness of government expenditure is investigated by...

(Scope) (1st ½ of 4th sentence)

Sample language:

**steps in I-Move**

A terminating rotational band has been identified in 51Mn K shell (1s) and L-shell (2s) ionization potentials…are predicted to an accuracy of a few 10 eV… (results preview)

We present results on time-dependent CP asymmetries in neutral B decays to several CP eigenstates. (results preview)

Abstract Moves and Steps

**M-Move and common steps**

Common steps in the M-Move

- **Common ways** to show that the method or MADT used was valid, or possibly superior or novel, for dealing with the problem: different kinds and amount of information:
  - Merely indicate what method / MADT was used (indicative methods)
  - Also briefly describe important aspects (informative-descriptive methods)
  - Also briefly explain or point to important aspects (informative-explanatory methods)

I-Move: scope step

- **Scope** = What is covered in the RA (the extent of the study)

- **Communicative aspects**:
  - I-Move with only scope.
  - Common with technically knowledgeable readers:
    - They have background to understand the objective and interest of the research from the description of the scope alone
M-Move
Step: indicative method / MADT

- Communicative aspects
  - Common when the method / MADT is:
    - standard, obvious, common for the readers
    - and/or easily accepted as suitable for dealing with the problem
    - and/or has no importance for demonstrating the interest, novelty or significance

M-Move: brief description step

- Refer to important aspects of the method and/or how it functions
- Communicative aspects
  - Common for methods / MADTs not well known to the audience
  - and/or not obvious for dealing with the problem
  - and/or important for showing the novelty, significance or viability of the results
  - appealing to the intended audience

Sample language: steps in M-Move

...using a 252Cf source in a differential plunger arrangement, together with the EUROBALL and SAPHIR multi-detector arrays. (**end ½ of first sentence**)

(informative-descriptive methods)

Sample language: steps in M-Move

A mixture of VFAs was spiked directly into a continuous-stirred tank reactor (CSTR) to assess subsequent impacts on nitrite removal, nitrate formation, CO2 fixation, total bacterial density, and dominant nitrite oxidizing bacteria (NOB) concentration (i.e. *Nitrospira*). The activity of the periplasmic nitrate reductase (NAP) enzyme and the presence of (nap) gene were also measured. (informative-explanatory-descriptive methods)

Sample language: steps in M-Move

...analyzing the birefringence induced in a room temperature vapour by a strong counterpropagating circularly polarized pump beam. In contrast to most other work on polarization spectroscopy, we use a polarization beam splitting cube and two detectors (rather than a polarizer and one detector) to analyze the probe beam. The signal is in the form of a derivative of a Lorentzian. For theoretical analysis we study the closed atomic transition 52 S1/2 (F = 3) → 52 P3/2 (F′ = 4) in the D2 line of 85Rb. We study the time needed (to redistribute population among the mF states, (long informative-explanatory –explanatory methods) Indicates important methodological implications of the research.
No M-Move

- Communicative aspects
  - Highly uncommon
  - Usually indicates that the method is obvious
- A four-move abstract with three moves!
  Silence often means something.

Common steps in the R-Move

- Common ways to clarify what outcomes were achieved: different kinds and amount of information
  - Merely indicate the type of novel outcome(s) (Indicative results)
  - Announce the best outcome(s) / validation result(s) with specific, often quantitative, information (Informative results)

Abstract Moves and Steps

R-Move and common steps

Common steps in the R-Move

- Common ways to clarify what outcomes were achieved
  - Also include a brief description of important aspects of their novelty/validity (descriptive results)
  - Also include brief explanation(s) (informative-explanatory results)

R-Move: the novel outcomes move

- Communicative aspects
  - If the results have already been announced in the I-Move (Results Preview), the R-Move then presents more detailed information / explanations
  - Sometimes there is only a results preview

R-Move: indicative results

- Only refer to the type of result
- Communicative aspects
  - Typically used when the novel outcomes are not easily described in a few words
  - The audience is already aware of the interest of the type of result
I briefly summarize the problems and advantages of each option and describe why there has been a move toward rights-based instruments in recent years: ITQ (individual transferable quotas), tradable emission permits, and private water rights. (indicative results)

**R-Move:** informative-descriptive results

- **Communicative Aspects**
  - Common when a brief factual statement is not sufficient to show the novelty/validity/interest of the novel outcomes

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**R-Move:** informative results

- **Briefly describe the most important result, often in quantitatively**
- **Communicative aspects**
  - Used to highlight the main facts that “speak for themselves” about their novelty/validity for a knowledgeable audience

Sample language: steps in R-Move

Test results showed that groove size tolerance up to +/-22% does not affect the overall performance of such systems. (Informative results)

The system has been proved capable of covering a range of lifetimes from a nanosecond to a picosecond. (Informative results)

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**R-Move:** explanatory results

- **Communicative Aspects**
  - Used to indicate briefly that / why the outcomes are novel / valid / interesting
  - To provide brief background
    - for an audience that might otherwise miss their novelty/validity/interest from the facts alone

Sample language: steps in R-Move

The analysis suggests a number of possible limitations to the use of auctions. Auctions may perform poorly when projects are complex contractual design is incomplete, and there are few available bidders. Furthermore, auctions may stifle communication between buyers and sellers, preventing the buyer from utilizing the contractor’s expertise when designing the project. (Informative-descriptive results in an Analysis RA)
The best immobilization results were obtained for beads of concentration of 10 mg of spray-dried cells (containing recombinant (S)-aminotransferase) per milliliter of sodium alginate bead. As a result of immobilization, the properties of immobilized spray-dried cells differed from the properties of free spray-dried cells. (Informative-descriptive-explanatory results) Comments: on which results were best / comparison of different results obtained)

Abstract Moves and Steps
The D-Move and common steps

Steps in the D-Move
- Principal conclusions about/ Implications of the novel outcomes
- Applications of the novel outcomes
- Recommendations/Suggestions based on the novel outcomes
- Interpretations of the novel outcomes

D-Move: the discussion move
- Topic: the main implications or significance of the reported research
  - Purpose: to clarify how the research makes a contribution of significance to the
    - the on-going work
    - and/or the long-term goals of the field
    - for the intended audience

Sample language: steps in D-Move
The implications of these findings for the design of trials of control agents that rely on artificial inoculation with Hannonsum and for the selection of dose rates to use in harvesting operations are discussed. (Indicative discussion of implications)

Experimental results show that the parallel implementation may produce significant speedups on multi-core machines. (Hedged implications)
Sample language:

steps in D-Move

These findings are in excellent agreement with theory.
(Principal conclusions—no hedging)

The in vitro antibacterial and antimycobacterial activities may support the use of Salvia species in traditional medicine to treat microbial infections (possible applications—hedging)

Cycling moves in Abstracts
(repetition of moves)

Common cycling sequence:

I-Move) Background and/or objectives, and/or results and/or scope of the investigation
M-Move) Method / MADT #1
R-Move) Major outcomes from Method / MADT #1
M-Move) Method / MADT #2
R-Move) Major results from Method / MADT #2
D-Move) Principal conclusions and/or implications and/or recommendations

Sample language:

steps in D-Move

The origin of this effect lies either in a rotational-induced shape change, or in the strong mixing between the ground and s-bands in 104Mo.
(Discussion of possible interpretations)

Alternative approaches to improving the cost-effectiveness of grant aid are discussed. (Very indicative reference to a discussion to a topic)

Cycling moves in Abstracts
(repetition of moves)

Common cycling sequence:

I-Move) Background and/or objectives, and/or results and/or scope of the investigation
M-Move) Method / MADT
R-Move) Major novel outcomes #1
D-Move) Implications of major outcomes #1
R-Move) Major outcomes #2
D-Move) Implications of major outcomes #2

Cycling the moves

Using the discourse of the abstract

READING SKILLS
Predicting and reading selectively

- Awareness of the common discourse of abstracts helps you:
  - predict what the main claims of novelty and significance will be
  - predict the main message in each section and which sections carry the main message
  - decide which sections to read, skim only, leave unread
  - READ ACTIVELY

To read actively

- Predict what you expect to find
  - Expected information/ideas
- Think about what you already know
  - Known information/ideas
- Think about what you want to find out
  - Sought information/ideas
  - READ ACTIVELY