RDRA: Lecture 7

Describing and discussing the novel outcomes

Reading Skills and the Discourse of the Research Article
LTH 2014
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Today’s class

Framing sections

Core sections

Results: Describes the novel outcomes achieved (R-section)

Discussion: Links the novel outcomes achieved to the general research area and shows their significance for the field (D-section)

Variations in the organization of results and discussion sections

R-, D- and R&D sections

VARIATIONS IN ORGANIZATION AND CONTENT

Framing sections

Introduction: Links the problem investigated to a general research area (I-section)

Core sections

Methods: Describes the means used to deal with the problem (M-section)

Results: Describes the novel outcomes achieved (R-section)

Discussion: Links the novel outcomes achieved to the general research area and shows their significance for the field (D-section)

Variations in the organization of results and discussion sections

• Stand-alone sections:
  I+M+R+D / I+R+D+M

• Combined sections:
  I+M+R&D / I+R&D+M
  I+M&R+D (Only with topic-specific headings and for novel or modified MADTs)

In RAs with topic-specific headings

• Series sections for example:
  I+M+R+R+R+D
  I+M+(Verification) +D
  I+M+R+R+D+D
  I+M+R&D
R-, D- and R&D sections
VARIATION IN COMMUNICATIVE PURPOSE

Purpose depends on the RA’s novel contribution
• The main novel contribution may be:
  • empirical findings produced/achieved for the first time, for example:
    • new data, more precise data, broader range of findings
    • characterization/isolation of a substance / behavior
  • new means of dealing with a problem, e.g:
    • a new or modified method, MADT

Purpose of R-sections
• If the main contribution is a new or modified method or MADT, the main purpose is:
  • to point out the novelty, value, validity, usefulness, superiority, etc., of the method /MADT
  • often presenting data supporting this novelty claim
  • and/or to present verification results (e.g., in Performance, Test runs, Simulations)
  • But the novel contribution is the method/MADT

Purpose of D-sections
• To position the novel outcomes, findings and insights of the reported research:
  • i.e., show how they relate, possibly with a stance, to:
    • previous research and the goals and directions of the field
  • Note: In the I-section, positioning is toward the research problem investigated

Purpose of R-sections
• If the main contribution is new findings, the main purpose is to:
  • announce and describe the new data /insights (informative)
  • make clear that they are novel (persuasive)
  • demonstrate their validity if necessary (persuasive)

Purpose of D-sections
• To establish the significance of the novel outcomes
  • by showing that they contribute to solving/dealing with research/and real-world problems important in the field
  • The problem mentioned in the I-section
R&D-sections: Common significance claims

• The novel outcomes:
  • allow for useful/important improvements / give important benefits
  • open up a new area of research
  • make possible applications considered necessary / useful/ important
  • solve theoretical, methodological or real-world problems considered important in the field

D-sections: Common significance claims

• The novel outcomes:
  • fill in gaps in information
  • make important additions to the body of knowledge of the field
  • propose new theories/concepts that (have potential to) solve problems or answer questions important for the field

R&D-sections: Communicative purpose

• To describe the outcomes and establish that they are viable and novel
  • AND to establish the significance of the novel outcomes and position them in relation to previous research and common accepted goals of the field

D-sections: Common significance claims

• The novel outcomes:
  • pose questions about or disprove existing assumptions considered important for the work of the field
  • confirm previous findings/theories (lowest level of significance but can add depth and interest to an RA)

Brief conclusions: Communicative purpose

• To clarify the most important and unambiguous
  • novel outcomes
  • implications of the reported research

R-, D- and R&D sections

VARIATION IN THE DISCUSSION OF THE NOVEL OUTCOME
Where does the discussion begin?
A continuum of possibilities

- A predominantly fact-based R-section:
  - Little or no data commentary
  - Discussion only or predominantly in the D-section

- A fact-discussion-based R-section:
  - Some data commentary
  - Initial discussion in the R-section, continuing in the D-section

- A combined R&D section:
  - Factual outcomes, data commentary and discussion in one section

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R-section: example of a fact-based paragraph, with no data commentary

TS: Examples of MICP curves are shown in Fig. 4. (figure reference to novel outcomes) SU’s: The modal pore throat diameter for the samples studied varies between 0.4 and 40 μm. For five samples, unimodal distributions were found, and for one sample (Masillon 106G), the distribution was found to be bimodal, with two peaks located at 18 and 33 μm. (novel findings)

Comment: here, verbs (were found, was found) use to indicate a result, data presentation with no commentary

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R-section: example of a fact-discussion-based paragraph

Helix 2 Contributes to DNA Binding—(Statement of novel outcome as a heading) Although our results indicated that binding of Mad to the GREGNCG occurs via the hairpin, (result) TS: we went on to whether residues within or adjacent to helix 2 might nevertheless contribute to binding. (Methodological considerations) The lysine-rich stretch of helix 2 has been shown to function as a nuclear localization signal (48, 49) (Previous research) but a series of helix 2 lysine to alanine mutations resulted in little or no change in Mad or Med levels in whole cell lysates of transfected 293T cells, as determined from Western blots(Fig. 3B) (Evaluation of data/comparing to previous findings)

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R-section: example of a fact-based paragraph with brief data commentary (background)

TS: The scenario conditions show some notable changes in the annual dynamics of ETR. (refer to type of outcomes) SU’s: The relative change is high during winter; (novel finding) however, this is the season when the ETR is low anyway. (data commentary) As Fig. 9b shows, the total change is highest in Spring and early summer, (novel finding with figure reference) which is the vegetation growing period, and therefore changes in land-cover have a higher impact on evaporation. (data commentary)

Comment: results indicated in TS statement + verbs (show, shows), data commentary (relevant background) to contextualize the results

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R-sections in biochemistry

Journal of Biological Chemistry (JBC), 16 articles by A. Kornberg (Nobel Prize laureate) from 1948-1990

Proceedings of the National Academy of Science (PNAS), 20 articles by biochemists in 1990.

<table>
<thead>
<tr>
<th>Table 2 Percentage of Results Sections Containing Rhetorical Moves</th>
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<tbody>
<tr>
<td>Rhetorical move</td>
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<tr>
<td>-----------------</td>
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<tr>
<td>Methodological justifications</td>
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<tr>
<td>Interpretations of results</td>
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<tr>
<td>Descriptive comments on data</td>
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<tr>
<td>Pure agreement with preestablished studies</td>
</tr>
<tr>
<td>Pure disagreement with preestablished studies</td>
</tr>
<tr>
<td>Casual referencing to disparities</td>
</tr>
<tr>
<td>Citing interpretations with perspectives</td>
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</tbody>
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"Arguing for Experimental ‘facts’ in Science" D.K. Thompson, Written Communication, Jan 1993
D-sections:
Communicative aspects

• After fact-discussion based R-sections:
  • stand-alone D-sections provide a discussion of more general issues of the significance and implications of the novel outcomes than in the R-section

D-section after the fact-discussion-based R-section example above

Finding that the 6-bp site is contacted by two Mad subunits raises new questions, because it is not clear how the two MH1 domains are arranged on the DNA, nor is it known why GNG or GNCN (depending on orientation) is recognized rather than the GTCT site preferred by Smad3 and Smad4. (unanswered questions) Previous work involving Smad1-Smad3 chimeras identified Lys-36 and Ser-37 of Smad3 helix 2 versus Asp-35 and Ala-36 in Smad1 as a key difference necessary for the activation of a (CAGA)9-luc reporter (51). (Previous research)

R&D section: an example of a paragraph

These results confirm that ammonia is an important parameter to be controlled in the “feast” and “famine” processes for PHB production. (implications) Ammonia limitation caused a decrease of the cell growth rate and led to an increase of the polymer storage yield and productivity. (refer to results to substantiate claim of implications)

Discussion-driven paragraph:
Discussion in the beginning of the paragraph, results follows = more common in (late paragraphs in) combined R&D-(sub)sections

Common organization of paragraphs in R-sections

• Results-driven paragraphs common in fact based R-sections
• Paragraphs with background sentences before top-down TS in fact-discussion based R-sections

R&D section: an example of a paragraph

TS: The dissolved oxygen concentration (DO) decreases immediately after substrate addition, remaining almost constant during the “feast” period and rising again after the carbon source exhaustion. (novel findings) The OUR was in agreement with the variations of DO concentration. (commentary substantiating validity) These results clearly indicate that the amount of substrate consumed during the “feast” period was used for PHB storage, cell growth, and maintenance processes (oxygen respiration). (implications)

Results-drive paragraph:
Results in the beginning of the paragraph, discussion follows = common in (early paragraphs in) combined R&D-(sub)sections

Common organization of groups of paragraphs in R-sections

• Often the most important and indisputable result(s) are early in the section
• The least important finding(s) and those most open to discussion, later
  • If logic permits
Common organization of paragraphs in D-sections

- Common paragraph sequences:
  1. Discussion-driven paragraphs
     - Emphasis on points of discussion
  2. Results-driven paragraphs
     - Emphasis on novel outcomes
  3. Both discussion-driven and results-driven
     - Emphasis on both

Common organization of paragraphs in R&D-sections

1. Results- and discussion-driven paragraphs:
   - Results-driven paragraphs in the beginning of a (sub)section
   - Discussion-driven paragraph(s) in the end
2. Results-driven paragraphs
   - Novel outcomes in the beginning of paragraphs and discussion as the paragraph proceeds
3. Mixed Results- and discussion-driven Results-driven paragraphs

Common organization of groups of paragraphs in D-sections

- Early TSs often refer to
  - The most important and indisputable:
    - Findings
    - Implications / applications of the findings
    - Issues of most interest to the audience and main message

Common organization of groups of paragraphs in D-sections

- Thereafter TSs often refer to:
  - Progressively less important findings / implications / applications / issues /limitations
  - those open to discussion
  - those of less interest to the main RA message about the RR
  - Late TSs tend to refer to the broad picture taking up, for example, further research.

Reading strategy

- Skim R-sections:
  - To determine whether the paragraph-initial sentence(s) focus on:
    - results (fact-based)
    - or background (fact-discussion-based) with result in a later (2nd or 3rd) sentence
Reading strategy:

- As you read **fact-based R-sections**, ask:
  - Why is discussion taken up separately from outcomes?
  - Do the “facts speak for themselves” about the novelty of the results?
  - Is the audience able (prefers to) assess the facts for themselves, without immediate discussion?

Reading strategy:

- Read the brief conclusion to get a clear sense of
  - the main message about novelty and significance
  - predict what topics, information, ideas and details will be central
  - understand why topics, information, ideas and details are included / not included in the R- and D-sections

Reading strategy:

- As you read **R+D** and **R&D-** sections, note:
  - how much and what kind of discussion tends to accompany the factual / logical presentation / description of the novel outcomes
  - in a particular RA
  - in a journal
  - in an area

Moves and steps in R-sections

Analyzing Communicative Purpose

**Topic and Purpose in R-Sections**

- **Main topic**: the original findings, outcomes, insights or approaches, or the validation of the novel outcomes
- **Main purposes**: to clarify what was discovered or developed (informative purpose) and demonstrate that these outcomes provide valid and original ways of responding to the research question, (persuasive purpose).
- Sometimes to demonstrate the validity of novel outcome(s), especially in for a novel or modified MADT. (informative and persuasive purpose)
Moves in R-Sections

• R-move 1) Create a context for the novelty claim: prepare and orient the reader so that they can understand and appreciate the novel outcomes
• R-Move 2) Establish novelty: describe the novel outcomes produced, if needed, explain why they are novel
• R-Move 3) Substantiate the novelty claim: demonstrate, confirm, support, clarify, illustrate, etc. the validity and/ or novelty by providing evidence and explanations for the novelty referred to in R-move 2.

R-MOVE 1

Common steps in R-move 1

Orienting steps:
• Step: Give a brief overview of the main points covered in the R-section / main important outcomes / main claim(s) of novelty (main points/concepts/ideas/issues)
• Step: Clarify the need for/purpose in obtaining the (type of) results (need/purpose)
• Step: Provide information about the organization of the section, the type of data presented and/or how to understand/interpret/locate data (help reading)

R-section: Communicative aspects

• Both M-Move 3 and R-Move 3) point out/comment on important aspects of the research work to show/support/demonstrate/clarify special value/interest of the work accomplished
• Unlike M-Move 3:
  • R-Move 3 is almost always included

R-section: Communicative aspects

• Moves in R-sections and M-sections are similar in many ways (both are core section):
  • R-move 1)/M-Move 1) are optional
  • M-Move 2)/R-Move 2) provide the main highly factual / logical description of the research work

Common steps in R-move 1

Background steps
• Step: Provide background the audience needs to understand and appreciate the results (general background)
• Step: Summarize aspects of the methods, especially those important for understanding the results (especially common if readers tend to skip the M-section)(methods summary)
R-Move 1:
Communicative purpose
• To ensure the readers
  • can locate and understand the results/outcomes (informative)
  • can appreciate the value, validity and novelty of the results/outcomes (persuasive)

R-Move 1:
Communicative aspects
• A lengthy R-Move 1 introducing a section or subsection tends to indicate that
  • the outcomes are unfamiliar, controversial, not typical
  • and/or the readers:
    • lack necessary background
    • typically read the R-section first

R-Move 1:
Reading strategy
• Pay attention to the amount and kind of orienting and background steps:
  • To determine the background, needs and interests of the intended audience
  • To discover possible audience assumptions about what outcomes are considered acceptably/somewhat/very/highly novel

Establish novelty
R-Move 2

Common steps in R-Move 2
• Step: Present preparatory or preliminary results produced (needed to achieve the novel outcomes) (preliminary results)
• Step: Refer to facts and data obtained/discovered for the first time (main/secondary) novel outcome/finding
  • As seen in Fig 3, an increase in X resulted in a decrease of 20% in Y.
• Step: Refer to the type of novel results (main/secondary) type of novel outcome
  • Fig. 3 shows the results of the experiments investigating the effect of X on Y.
Common steps in R-Move 2

- **Step:** Refer to new relationships discovered (new relationship)
  - The findings show a clear correlation between X and Y.
- **Step:** Refer to the novel (modifications of) methods/MADTs developed
  - This procedure was developed to allow for modeling of both parameters simultaneously.

R-Move2: Reading strategy

- Pay attention to the way novelty claims are formulated:
  - To determine the background and interests of the intended audience
  - To discover possible audience assumptions about what is an adequate, good, excellent, ground-breaking result

Common steps in R-Move 2

- **Step:** Refer to applications made possible by new methods/MADTs (applications)
  - As a result, the device can be used with fluids that are not homogenous.
  - This approach provides a straightforward mean of determining...
- **Step:** Refer to methods and results of methods for verifying the outcomes obtained with the method or MADT (verification methods/results)
  - The predictions are in good agreement with the data collected over the past 40 years for...

Substantiate the novelty claim R-Move 3

Common steps in R-Move 3

- **Step:** Provide evidence/commentary to demonstrate/clarify how the findings/novel outcomes are valid, viable, reliable, accurate, suitable for solving/dealing with the problem investigated, etc. (show validity/viability/accuracy/suitability, etc...of the findings/novel outcomes)
- **Step:** Point out/demonstrate/clarify/explain how the findings/novel outcomes are novel (comment on/support novelty)

R-Move2: Communicative purpose

- To establish/point out/clarify that the research produced valid outcomes that are novel, that is:
  - findings, insights, methods, data, model modification, etc. not previously obtained
  - Sometimes to clarify the kind of novelty and/or degree of novelty claimed
Common steps in R-Move 3

• Step: Explain/interpret important or non-obvious relationships that clarify or, especially, confirm or substantiate novelty and viability. (interpret / explain)

Common relationships include those between:
• The data obtained and theory
• The methods and the novel outcomes
• The various novel outcomes

Moves and steps in D-sections

The significance of the novel outcomes

Common steps in R-Move 3

• Step: Demonstrate/comment on important, non-obvious aspects of the findings/outcomes (e.g., their interest, importance, viability, reliability, value) in preparation for the D-section discussion. (demonstrate importance)

D section: Topic and Purpose

• Main topic: the significance/implications of the novel outcomes
• Main purposes: to describe the significance and implications of the novel outcomes (informative purpose) and show that they contribute to the on-going research and are of value for the long-term, current and future goals of the field (persuasive purpose)

R-Move 3: Communicative purpose

• To make sure it is clear what is claimed as novel (R-Move 2)
• To substantiate in detail the statements of novelty (R-Move 3)
• To use facts/logic to meet possible objections or scepticism about the novelty (R-Move 3)
• To indicate which novelty claims are primary and which are secondary (R-Move 3)

Moves in D-Sections

D-move 1) Create a context: orient the reader to the main implications and significance of the novel outcomes
D-Move 2) Re-establish the niche: show how the reported research responds to previous related research and to the problem investigated (i.e., the niche)
D-Move 3) Re-establish the territory: show that the novel outcomes have implications of significance for the general goals and direction of the field
D-move 1

Create a context for discussing significance: orient the reader to the main value, implications and importance of the novel outcomes
Optional

D-Move1: Communicative purpose

- To ensure the readers:
  - do not miss the main significance of the novel outcomes
  - are oriented toward the main message(s) about significance as they read the section

Common steps in D-Move 1

Step: Preview the main implications / applications claimed (implications / applications)
Step: Preview the main points to be covered (main points)
Step: Summarize the main novel outcomes achieved, especially when readers tend to skip the R-section (Summary of novel outcomes)

D-Move1: Communicative aspects

- May be found:
  - in the beginning of (sub)sections or within paragraphs as introductory text
  - within (subsections) to clarify aspects

Common steps in D-Move 1

Step: Briefly describe important aspects of the method / MADT used if central to or the main contribution, especially if readers tend to skip the M-section (Methods Summary)
Step: Point out/review how the goals of the reported research (Goals)
Step: Point out links between the outcomes and the accepted goals of the field (goals and links to the research area)
Step: Provide factual or conceptual background supporting significance claims (background)

Re-establish the niche

D-Move 2
Common steps in D-Move 2

- Step: Claim the novel outcomes have implications/applications/benefits of significance for the research field and/or for solving real-world problems (*Novelty/Implications*)
  - a central positioning step /usually obligatory

D-Move2: Communicative purpose

- To demonstrate that the novel findings have important implications for the on-going research of the field
- To position the research with relation to the on-going research of the field

Common steps in D-Move 2

- Step: Show how the novel outcomes add to, confirm / are confirmed by, question or disprove specific previous related research. (*Previous research*)
  - an important positioning step /usually obligatory

D-Move2: Communicative purpose

- To show competent knowledge of / ability to contribute to the discussion of how the reported research:
  - relates to specific research in the field
  - builds on related research and/or advances or questions that work

Common steps in D-Move 2

Step: If necessary, substantiate, point out or clarify the claim of novelty or significance (*point out novelty*)
Step: If necessary, admit the limits of aspects of the research findings or methods (*limitations*)
  - a step often avoided in some areas
  - necessary for credibility in others

D-Move 3

Re-establish the territory
Common steps in **D-Move 3**

**Step:** Link the findings to the values and goals of the common ground (links findings to the goals of the field)

**Step:** Discuss interesting insights or questions that arose from the research (insights and important questions)

**Step:** Make specific recommendations or general suggestions based on the findings (recommendations/suggestions)

**Step:** Claim the findings have implications for future research (sometimes used instead of indicating limitations) (future research)

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**In-class analysis**

- Bridge and tunnel toll elasticities in New York: Some recent evidence
- Transportation

- “Ozone Storage Effects on Anthocyanin Content and Fungal Growth in Blackberries,” Journal of Food Science

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**R-Move 3: Communicative purpose**

- To discuss the reported research:
  - To show how it
    - solves/contributes to solving the problem described in the I-section
    - contributes to the general goals and direction of the field
    - relates to/can contribute to an understanding of important issues, problems and questions in the field

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**In-class analysis**

1) Skim the TSs in the R- and D-sections and predict
   A. Who the intended audience is.
   B. What the main contribution is:
      a) new data produced using an existing experimental method?
      b) a new or modified method or model?
      c) applying an existing method or model to a new area?
      d) findings produced applying an existing model?
      e) Other?
2) Identify any moves and steps from the checklist
3) Create new steps if needed

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**D-Moves 1, 2 and 3 Common organization (1): Reverse of the I-section**

**I-section**

CONVERGING toward the reported research

- Establish the territory (the general area)
- Establish a niche
- Occupy the niche (the reported research)

**D-section**

Create a context

Discussion Section

DIVERGING from the R

- RE-Occupy the niche (the reported research)
- RE-Occupy the territory (the general area)

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**Homework for workshop**

- Analyze (part of) R, D- or R&D:
  - Underline any headings or subheadings and any Topic Sentences
  - Mark any Moves and Steps
  - Underline any information in the RA’s abstract that is also found in the section to be discussed.
  - Be ready to take up/point out possible issues for discussion (See Overview of course requirements)

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Homework

- For those leading the workshop discussion
  - Complete the Journal Impact and Citation Index Exercise for the RA
  - Two working days before the workshop, send your copy of the section analysis by e-mail, along with the Journal Impact and Citation Index Exercise to Margaret and to the other people in your workshop group