The Introduction Section of RAs

Reading the discourse of the research article
Autumn 2014
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Writer Purpose
In the RA:
- Provide an account of the new research (informative)
- Make clear its novel and significant contribution to the field (persuasive)

In the abstract:
- Provide a condensed version of
  - the main aspects of the research (informative)
    - Problem investigated, means of studying it, novel outcomes, significance of the outcomes (informative)
  - its main contribution (persuasive)
    - Purpose is carried out in 4 moves

Moves and paragraphs
- Moves are used simultaneously with, but do not necessarily coincide with, paragraphs.
- Paragraphs are organized and formulated according to TOPIC
- Moves are organized and formulated according to PURPOSE

Writer purpose in the introduction section
- To show
  - what problem is investigated (informative)
  - that the research investigates a problem of interest for the field and for the intended readers (persuasive): The same purpose as the I-Move of the abstract
  - The purpose of the introduction section is typically accomplished in 3 moves

Common organization of I-Moves
- Introductions typically include all three moves
  - begin with I-move 1
  - end with I-Move 3
  - Cycling: In longer introductions, there may be repetition of moves after the first I-Move 1 and before the last I-Move 3

The Moves of the Introduction
John Swales' Create a research space Model (CARS)

- I-Move 1: Establish a territory
  - Purpose: To link the problem studied to the general research area

- I-MOVE 2: Establish a niche
  - Purpose: To indicate the need to study a specific problem in the general area

- I-MOVE 3: Occupy the niche
  - Purpose: To indicate how the reported research responds to the specific problem

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Possible steps in I-Moves

- **STEPS IN I-MOVE 1, Establish a territory**
  - Claim centrality for the area
  - Indicate a territorial lack or problem
  - Present background / topic generalizations
  - Review previous research

- **STEPS IN I-MOVE 2, Establish a niche**
  - Indicate lacks, inadequacies, limitations and/or failures
  - Indicate the present research continues a tradition
  - Point out an unsolved research or real-world problem
  - Make counterclaims

- **STEPS IN I-MOVE 3, Occupy the niche**
  - Announce objectives of the reported research
  - Announce principal outcomes (novel contribution)
  - Describe the scope of the reported research
  - Refer to important aspects, e.g., method used, applications important to the audience
  - Announce the RA structure

Possible steps in I-Moves

**Common organization of I-Moves:**

- **I-move 1**
  - General area/problem/issue
  - Establish a territory
  - Claim centrality for the area
  - Indicate a territorial lack or problem
  - Present background / topic generalizations
  - Review previous research

- **I-Move 2**
  - Specific problem for study
  - Cycling of all moves
  - Indicate lacks, inadequacies, limitations and/or failures
  - Indicate the present research continues a tradition
  - Point out an unsolved research or real-world problem
  - Make counterclaims

- **I-Move 3**
  - The research response to the problem
  - Announce objectives of the reported research
  - Announce principal outcomes (novel contribution)
  - Describe the scope of the reported research
  - Refer to important aspects, e.g., method used, applications important to the audience
  - Announce the RA structure

**Steps in I-Move 1: Establish a territory**

- Announce the problem studied and link it to the general research area/common ground of the field
- Claim centrality for the area (**centrality claim**)
- Point out a territorial lack or problem (**territorial lack**)
- Present background/Topic generalizations (**background**)
- Review previous research (**review research**)

**Steps in I-Move 2, Establish a niche**

- Indicate lacks, inadequacies, limitations and/or failures
- Indicate the present research continues a tradition
- Point out an unsolved research or real-world problem
- Make counterclaims

**Steps in I-Move 3, Occupy the niche**

- Announce objectives of the reported research
- Announce principal outcomes (novel contribution)
- Describe the scope of the reported research
- Refer to important aspects, e.g., method used, applications important to the audience
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**I-Move 1: Establish a territory, i.e., the general research area**

**Step:** Claim centrality for the area

This approach provides an excellent test for our current understanding of the origin of viral infection.

(Usefulness for the research area + timeliness)

Ultrasound is used in a wide variety of applications...

(Common/widespread use)
I-MOVE 1: Establish a territory, i.e., the general research area
STEP: Claim centrality for the area

There is currently great interest in optimizing matrix assisted laser desorption/ionization (MALDI) for all classes of synthetic polymers. [1-3]
(Timely + Interest in the research area + wide usefulness)
MALDI offers various potential benefits for polymer characterization,
(Usefulness)

I-MOVE 1: Establish a territory, i.e., the general research area
STEP: Background /Topic Generalization

Typical Nusselt number profiles for a turbulent impinging slot jet give expected maximum levels of heat transfer in the stagnation region directly beneath the impinging jet.
(Factual background)
The theory up to now has explained this behaviour as resulting from the interaction of…
(Conceptual background)

I-MOVE 1: Establish a territory, i.e., the general research area
STEP: Point out a territorial lack

Pesticide contamination of the environment is of increasing concern in the developed countries. (WHO, 1984)
(general unsolved real-world problem)
Note:
NOT the specific problem solved by the reported research, but a general one

I-MOVE 1: Establish a territory, i.e., the general research area
STEP: Claim centrality + background

Multifunctional sentence (2 steps):
Ultrasound is used in a wide variety of applications, including medical imagining, nondestructive evaluation (NDE) and gas-flow metering.
(Centrality claim = Common/widespread use)
(Factual background list of benefits supporting centrality claim)

I-MOVE 1: Establish a territory, i.e., the general research area
STEP: Claim centrality + background

Multifunctional sentence (2 steps):
MALDI offers various potential benefits for polymer characterization, (Centrality claim, usefulness and is used for example in absolute molecular weight determination, structural elucidation and endgroup analysis.
(background, list of benefits for research)
Multifunctional discourse (3 steps):

The use of pesticides is increasing rapidly in developing countries at a time when their use in developed countries is stable or declining.

Factual background (situation in the world)
Territorial lack (real-world problem)
Centrality claim implications (timeliness/implied need for a solution)

STEP: Review the previous research

Researchers have begun to address the above concerns by coupling GPC with MALDI, either online or off-line, extended the performance and understanding of cMUT's.

(Ø stance + timeliness)

Studies of these issues have demonstrated that this is a major problem which primarily affects … (McConnell and Hruska, 1993; McConnell et al.) (+ stance)

COMMON REPORTING VERBS indicating stance in previous research step

- Positive stance (Commitment to / support for the research): show, demonstrate, establish, prove, support, confirm
- Neutral stance (Neutral or weak support): suggest, propose, examine, investigate, report, indicate
- Negative stance (Disagreement with or questions about the research): claim to show, purport to prove, attempt to show, appear to support... in fact...

OTHER PARTS OF SPEECH to indicate STANCE

- Positive stance:
  - Adjectives: superior, definitive, conclusive, impressive, promising, effective
  - Adverbs: conclusively, clearly
  - Nouns: proof, strong evidence
- Neutral stance:
  - Adjectives: viable, useful, sufficient, adequate
  - Nouns: investigation, study, report, project
- Negative stance:
  - Adjectives: inadequate, insufficient, imprecise, trivial
  - Adverbs: seemingly, ostensibly
  - Nouns: attempt, claim
Main purposes in the steps in I-Move 1

- In all four steps, the purpose in I-Move 1 is:
  - To link the problem studied in the RR (reported research)
  - to the general research area (the territory)
  - To show a competent knowledge of (and possibly an ability to discuss) the important issues/problems in the field
  - To position the reported research within the general area of research

Purposes in the different steps in Move 1

- **Background / Topic generalization:**
  - To supply information needed
    - to support/clarify the authors’ claim of centrality/territorial lack
    - To ensure that the audience to understand
      - the reported research
      - how it relates the field
  - Amount and kind of background is a good indicator of the intended audience

Purposes in the different steps in Move 1

- **Centrality claim:**
  - To show the importance for the field of the type of issues considered in the RA
  - And/or to remind readers of the importance of these issues

Purposes in the different steps in Move 1

- **Territorial lack**
  - To indicate and/or remind readers that there exist unsolved problems
    - of clear importance to the field
    - or easily seen as important given the accepted goals of the field

Purposes in the different steps in Move 1

- **Research review**
  - To position the reported research with regard to similar/related work
  - To show a competent knowledge of the related/similar research

Differences in stance in I-Move 1 steps

- **Centrality claims and background and territorial lacks**
  - steps typically refer to uncontroversial research/issues/ideas accepted as part of the body of knowledge of the field
  - Stance-taking is uncommon/unnecessary.

- The **Research review** step refers to research that may not yet be fully accepted in the field.
  - Stance-taking is thus of interest/importance/common:
    - for positioning the RR
    - indicating the value of studying the research problem
Differences in the use of references

- In the review research step, references to specific RAs must be included:
  - to establish credibility, accuracy
  - to acknowledge indebtedness, substantiate claims, support stance, etc.
  - to position the research
- In the other steps, references may be cited:
  - to indicate where information can be found / possibly to substantiate statements / facts
  - Informative rather than persuasive

I-MOVE 2 (Establish a niche)
STEP: Indicate lacks, inadequacies and/or failures

Common cycling of moves and steps: I-Move 1: research review + I-Move 2: indicating gaps:

Several studies have demonstrated the value of this approach (Kodem, 2011, Kent et al, 2012, Lee, 2012).
(Research review)
However, there are few reported long-term outcomes regarding their condition after stand closure.
(indicating gaps)

STEPS IN I-MOVE 2: Establish a niche

Indicate the need to study a specific problem in the general area (territory) in I-Move 1

Indicate lacks, inadequacies and/or failures (indicating gaps)
Indicate the present research continues a tradition (building on existing work)
Indicate a specific unsolved research or real-world problem remains (raising questions/pointing out problems, important issues)
Pointing out that the RR disproves previous research (counterclaims)

I-MOVE 2 (Establish a niche)

STEP: Indicate lacks, inadequacies and/or failures in previous research

...; unfortunately, the data on these elements are still very scarce.
However, there are significant uncertainties in these studies.
No previous experiment has covered a broad range of ...
...their suitability for complex biodiversity issues is not yet proven (Hanley and Spash, 1993; Dias, 1994).

COMMON LANGUAGE to indicate lacks, failures and inadequacies

Expressions of contrast:
However, nevertheless, yet, but, unfortunately
Expressions with negative connotations:
- Nouns: Failure to, limitation, absence of, lack of
- Verbs: fail to, lack, overlook, underestimate, be content with, concentrate on, be limited to
- Adjectives: inconclusive, complex, misleading, limited, questionable, time-consuming, expensive, insufficient, not sufficiently accurate, invasive
- Negative quantifiers: no, little, none (of), few(-), very few, neither...nor (a few)= some (+)

I-MOVE 2 (Establish a niche)

STEP: Indicate that the present research continues a tradition

We apply this method in order to take advantage of the increased selectivity it provides over...

These findings indicate that a potential exists for enhancing the reliability of...
I-MOVE 2 (Establish a niche)

STEP: Indicate that the present research continues a tradition

Common order of moves and steps (I-Move 1: Research review + I-Move 2: Building on previous work):

Sweedler used the channel electrophoresis technique to study derivatization reactions in nanoliter volumes. (Research review)

We apply the same technique in the analysis of dynamic neurotransmitter release from cellular systems. (Building on existing work)

COMMON LANGUAGE to indicate a tradition is being continued

VERBS: Improve, (further) develop, enhance, better understand, continue, build on, modify, increase, optimize, gain / provide / use / profit from (e.g., insights, this new technique)

EXPRESSIONS with MODALS: would be useful, could prove helpful, might provide insights into, should be further developed / investigated

NOUNS: Improvements, developments, modifications, clarifications, continuation, potential

ADJECTIVES: promising, potential

I-MOVE 2 (Establish a niche)

STEP: Indicate an unsolved real-world or research problem, important questions

Two main questions remain about what constitutes sufficient…

A clearer understanding appears to be needed if...

Furthermore, to learn how the interaction of plantation stands alter competition dynamics, it is essential to study both pine and competing plants from many locations.

I-MOVE 2 (Establish a niche)

STEP: Make counterclaims

The “counterclaims step” language is similar to that of the “lacks step”, but is stronger (i.e., less hedged)

- It is a claim that the RR is the only correct outcome/approach/solution
- Uncommon in most fields

Main purposes in the steps in I-Move 2

- To indicate there is a need within the research area to study a specific problem
  - within the general area referred to in I-Move 1

- To position the research with regard to specific previous research or research or real-world problems

Note:
- The "continuation step" is often carried out using information alone:
  - that is, it is written for knowledgeable readers who understand from the information the research applies the findings / method approach referred to or cited
Differences in steps in I-Move 2

- With the lacks and inadequacies step:
  - Authors point out that researchers have tried with limited or lack of success to solve a problem
  - Research must be cited/Stance is negative toward previous research
- With the continuation of research tradition step:
  - Authors show that the research applies the work of others in their own research
  - Research must be cited/Stance is positive toward previous research
- The raising questions/important problem step:
  - Authors merely show that a problem of importance exists/important questions need to be answered
  - Reference to specific previous research not necessary/implied stance

I-Move 3: Occupy the niche (The RR as a response to Move 2)

STEP: Announce principal outcomes

In this study, we developed five lectin immunosorbant assays (total SNA, total MAL I, free MAL I, total MAL II, and free MAL II), which analyze α2,6-linked sialylation of total serum PSA by Sambucus nigra lectin (SNA) … (Principal outcomes)

... Our study found clear evidence of a negative relationship between… (Principal outcomes)

This paper describes the development and application of an expert scoring system for evaluating the cost-effectiveness of government expenditure. … (Principal outcomes)

I-MOVE 3: Occupy the niche

Indicate how the reported research responds to the problem pointed out in Move 2

Announce objectives (objectives)
Announce principal outcomes (novel outcomes)
Describe the scope of the research (Scope)
Refer to important aspects, e.g., method used, important applications (important aspects)
Announce the RA structure (RA structure)

I-Move 3: Occupy the niche (The RR as a response to Move 2)

STEP: Scope

This paper explores the extent to which technological learning has occurred in two industrial sectors: industrialized housing and car production. (scope)

We conducted a study of the interaction of iron and zinc on clinical outcomes when these minerals are supplemented separately versus together… (scope)

I-Move 3: Occupy the niche (The RR as a response to Move 2)

STEP: Objective

The aim of this study is to characterize defects and present the production process at two companies (Table 1) in order to gain insight into the current quality level. (Objective)

The main goal of this study was to examine whether this equipment is capable of producing extra carbon from SAS and to investigate the mechanisms of disintegration. (Objective)

I-Move 3: Occupy the niche (The RR as a response to Move 2)

STEP: Announce RA structure/objectives

The first part of this review summarizes the critical aspects of stand stability. The second part focuses on the economics of various thinning strategies in terms… (Step: Announce the structure)

My objectives in this paper are threefold. First, I define attributes of the decision space in which the model is to be used. Second, I examine model linkages to the environment… (Objective explained using the RA structure)
I-Move 3: Occupy the niche (The RR as a response to Move 2)

**STEP: Important aspects**

The processes investigated are widely used in many food industries. *(Important aspects for industrial audience)*

In this study, a *two-phase approach* was applied in the … *(Important aspect: novel modification of a method)*

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**Purpose in all steps of I-Move 3**

- To show the value and interest of the reported research (RR)
- To show that the RR is a viable / interesting / useful / novel / significant response to the niche created in I-Move 2

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**Differences in the steps of I-Move 3**

- Authors tend to select the steps:
  - most useful step(s) for clarifying the novelty and significance of their research
  - of greatest for the intended audience
  - By noticing which steps are selected/ not selected, you can often predict:
    - What major aspects of the research the authors will/will not highlight in the RA
    - Who the intended audience is

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**CYCLING **
*(Repeating sequences of moves or steps)*

- **Common cycling of steps in I-Move 1**
  - Step: Centrality Claim
  - Step: Background / Topic Generalizations
  - Step: Centrality Claim
  - Step: Background / Topic Generalizations

**NEW Paragraph**

- I-Move 2
  - Step: Previous Research (negative stance)
  - NEW Paragraph
    - I-Move 2
      - Step: Continuing previous research

**NEW Paragraph**

- I-Move 3

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**Reader strategies: Using the discourse of the Introduction section**

- **Use top-down organization**
  - To skim introduction paragraphs
    - to discover the main topics and the main points the author wants to highlight about:
      - The research problem
      - Its significance in the field
      - (The need for further research if mentioned in the TS)
      - The novel contribution made to solve the problem
Reader strategies: Using the discourse of the Introduction section

- **Use knowledge of moves in introductions**
  - To locate relevant information quickly if it tends to be in a typical order in a journal/area of research
  - To understand the purpose of the information located

Homework due next week

- All students:
  - Assignment 2) Do an informal analysis of paragraphs and moves and steps. Bring your informal analysis to the workshop next week, along with the whole RA.
- One student in each group
  - Assignment 3)
    - Lead a discussion on the I section of your sample RA. Sign up for leading a discussion today if you have not yet
  - Assignment 4)
    - Do the science citation index exercise. Send it with your analysis when you lead the section discussion in the workshop.

In-class practice analysis

1. In groups of 3, look for the moves and steps in "Stress-dependent flow through fractured clay till: a laboratory study"
2. Discuss how the steps are used to fulfill the purposes of each move.
3. Discuss which moves and/or steps are found in TS position.
4. Discuss any use cycling.

In-class practice:
   analyzing an introduction section

PRACTICE ANALYSIS OF THE MOVES AND STEPS

Stress-dependent flow through fractured clay till: a laboratory study