BCS 206 :: Writing Like a (Cognitive) Scientist

Common Structure of Research Articles: Though research-based articles can differ wildly across disciplines, and even within disciplines, they generally share a common "core": the IMR(A)D structure.

I: Introduction ("What do we need to know", "Why does it matter?" and "What do we think the answer is?")
M: Method ("What did we do to try to find the answer?")
R and A: Results and and Analysis ("What did we find out?")
D: Discussion ("What do our findings mean?" "How does this relate to the 'big picture'?")

The reason research-based articles share this core structure is because it captures what we do when we investigate things through scientific research - those questions map onto the "scientific method".

Common Structure within Introductions: John Swales (1990) did a corpus-analysis of introductions from research-based articles across a wide range of academic disciplines, and found that they, too, shared a common structure, which he refers to as the "Creating a Research Space" (or CARS) Structure:

Move 1: Establishing a territory
- Step 1: Claiming importance AND/OR
- Step 2: Making topic generalizations AND/OR
- Step 3: Reviewing items of previous research

Move 2: Establishing a "niche"
- Step 1a: Counter-claiming OR
- Step 1b: Indicating a gap OR
- Step 1c: Question-raising OR
- Step 1d: Continuing a tradition

Move 3: Occupying the niche:
- Step 1a: Outlining purposes OR
- Step 1b: Announcing present research
- Step 2: Announcing principle findings
- Step 3: Indicating article structure

Again, there's good reason: these moves are exactly the moves you need to make in order to establish a common understanding of the territory with the reader, and claim that your research will provide a necessary and important contribution.

Exercise 1: Analyzing an Introduction (from your paper, or another paper)

1. Read through JUST the introduction/background section of the paper. How well do you think it "works"?
2. Highlight any sentences that seem to be making "Move 1" in GREEN. You can also label them with the "Step" number.
3. Highlight any sentences that seem to be making "Move 2" in YELLOW. Label which "Step" you think is being taken.
4. Highlight any sentences that seem to be making "Move 3" in PINK. You can also label them with the "Step" number.
5. Look at the patterns. Do the Moves appear in the right order? Within each Move, does each necessary Step appear in the right order?
6. If you notice a missing Move or Step, or one that appears out of order *in your own paper*, see if you can revise the introduction so that it appears in the expected place. Re-read the introduction - does it work better?

Common Structure within Methods and Results Section? This is trickier, because these are the parts of the research process that are VERY discipline-specific. Cognitive Science alone encompasses an enormously broad range of subfields, each with a variety of methodologies and approaches to data analysis. The best approach here is to find papers that use similar methods/analysis techniques (if you have a journal in mind for your own paper, look for papers from THAT journal), and look for patterns.

Exercise 2: Analyzing the structure of Methods and Results Sections:

1. Gather your papers, and focus on JUST the Methods, or JUST the Results section of each paper.
2. Make note of the patterns you find. If you had to label the "Moves" and "Steps" that are needed, what would you call them?
3. Apply these observations to your own writing!

Common Structure within Discussion Sections: Though there are still discipline and even journal-specific expectations for how a Discussion section will be structured, there are some core moves that have been identified by linguists who've done corpus studies like Swales. Here's one way of stating the patterns most common in the kinds of research done by cognitive scientists:

- **Move 1:** Contextualize the findings (often echoing questions presented in Introduction)
- **Move 2:** Restate selected findings
- **Move 3:** Offer interpretation of the findings
  - **Step 1:** Make overt claims or generalizations
  - **Step 2:** Acknowledge limitations
  - **Step 3:** Ward off counter-interpretations of the findings
- **Move 4:** What's next?
  - **Step 1:** State implications
  - **Step 2a:** Set up the question for the NEXT study AND/OR
  - **Step 2b:** Suggest future research directions

Exercise 3: Analyzing the structure of the Discussion Section (of your own paper, or another paper):

1. Read through JUST the Discussion section of the paper (one at a time, if there are multiple ones). How well does it "work"?
2. Highlight any sentence that seems to be making Move 1 in GREEN
3. Highlight any sentence that seems to be making Move 2 in YELLOW
4. Highlight any sentence that seems to be making Move 3 in PINK. Label which step you think each sentence is making.
5. Highlight any sentence that seems to be making Move 4 in ORANGE. Again, label steps.
6. Look at the patterns. Do the Moves appear in the right order? Within each Move, does each necessary Step appear in the right order?
7. If you notice a missing Move or Step, or one that appears out of order *in your own paper*, see if you can revise the introduction so that it appears in the expected place. Re-read the Discussion - does it work better?

Why think about patterns?

1. The patterns are there because they reflect the underlying "story" of your research
2. Readers who are familiar with the discipline will have expectations about these patterns - meeting reader expectations is a big part of what makes readers think that your paper "flows" and is coherent.
3. If you're stuck, you can treat them as a "template" - you still have to fill in your OWN material, but it can give you a good starting point.
4. They're a good "diagnostic" tool during revision - if a section isn't working, see if it's following the patterns. If not, revise!