

Week 2

Academic articles and Baldwin Formula for Academic writing

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Random groups

- Please sit with people in your TRACK if you can
- Energy AI
- Energy materials and devices
- Grid modernization track
- Hydrogen energy track
- Environmental and climate technology track

Questions?

Homework

- Did everyone upload this ok?
- No system problem?

NOTES

- EMAIL ME
- Don't send a message on the LMS system because I do not always get them

Discussion

- Quick group discussion of the HW article
- Was it useful?
- Was it new to you?
- Was it helpful?

Summary of week 1

- Some final things I want to mention from week 1

Example 2: Is this a good para? Why or why not? Discuss in groups.

The most important thing for students to study at university is philosophy. Technical skills, like math and engineering, are very important also. Many famous businesspeople like Peter Thiel, Jack Ma, and Susan Wojcicki did not study business, but they still became famous in the technology industry. All of these famous people became very successful in very technical fields. They also founded or enhanced amazing and innovative technologies that changed the world. Therefore, instead of studying engineering or math, students will benefit most from studying philosophy. That being said, math and engineering should not be neglected.

BAD paragraph!

- Why?

BAD paragraph! Why?

- Lack of focus - what exactly is this about?
 - Philosophy majors instead of STEM?
 - The achievements of Thiel, Ma, and Wojcicki?
- Poor structure
 - Jumps between these two ideas
- Poor language
 - Never explicitly states the main idea itself OR even takes a clear stance

Better paragraph

There is a debate concerning whether students should study hard sciences (such as math and engineering) or soft sciences or humanities (such as English or philosophy). While I see merits to both, I believe that it is better to study philosophy compared to STEM fields. Studying a soft science does not necessarily mean that students must neglect hard sciences and engineering. Many students who study humanities subjects can still study engineering and math outside of class to high levels. Additionally, many famous tech leaders were not STEM majors. For example, Peter Thiel of Paypal studied philosophy and law, while Jack Ma of Alibaba studied English. CEO of YouTube, Susan Wojcicki studied economics and business. So to succeed in technical fields does not require an engineering degree. I also think that the humanities and soft sciences teach crucial skills that will leave students disadvantaged if they do not have them. For these reasons I think students should major in a soft science or humanity field and study engineering and math as hobbies.

Better paragraph

There is a debate concerning whether students should study hard sciences (such as math and engineering) or soft sciences or humanities (such as English or philosophy). While I see merits to both, I believe that it is better to study philosophy compared to STEM fields. Studying a soft science does not necessarily mean that students must neglect hard sciences and engineering. Many students who study humanities subjects can still study engineering and math outside of class to high levels. Additionally, many famous tech leaders were not STEM majors. For example, Peter Thiel of Paypal studied philosophy and law, while Jack Ma of Alibaba studied English. CEO of YouTube, Susan Wojcicki studied economics and business. So to succeed in technical fields does not require an engineering degree. I also think that the humanities and soft sciences teach crucial skills that will leave students disadvantaged if they do not have them. For these reasons I think students should major in a soft science or humanity field and study engineering and math as hobbies.

Topic sentence, Supporting idea 1, Supporting idea 2, Supporting idea 3, Concluding sentence

Ideal outline of paragraph

- Topic/Main Idea: I argue that it is better to study philosophy compared to STEM fields.
- Supporting sentences/ideas:
 - # 1 Majoring in philosophy does not mean you have to neglect STEM
 - #2 Many famous tech people did not major in a STEM field
 - Thiel, Ma, Wojcicki
 - #3 Soft sciences/humanities teach important skills students can't learn in sciences
- Concluding sentence: For these reasons I think students should major in a soft science or humanity field and study engineering and math as hobbies.

This is a powerful and effective structure, but....

- This is just a structure NOT a rule
- You will see all different kinds of variations of this in English writing

NOTE

- Skipped some content from week 1
- Review on your own and ask me if you want to review it

Week 2 Overview: Important Week

- General academic article structure
 - Intro
 - Thesis statement
 - Body
 - Conclusion
- We are going to see what kinds of content goes into these
- Baldwin formula for academic writing
- Think about research topics for final paper
- Writing workshop activity

Opening discussion (5 minutes)

- WHAT IS THE BASIC STRUCTURE OF AN ENGLISH ARTICLE OR ARGUMENT?
- ARE THERE ANY DIFFERENCES IN THE WAY PAPERS OR ARTICLES MAY BE WRITTEN AND PRESENTED?
- Talk about this together

Academic article structure

- General format of English writing (review?)
 - Do you know this already?
- There is a lot of flexibility in English writing
- But there are also a lot of things you cannot/should not do
- We will review all of them

Components to academic articles (basic)

1. Introduction
 - a. THESIS STATEMENT
2. Body
 - a. Body part 1
 - b. Body part 2
 - c.
3. Conclusion

Components to academic articles (detailed)

1. Abstract (we discuss this later)
2. Introduction
 - a. introduction (contextualize, explain)
 - b. Problem paragraph
 - c. Research findings and argument
3. Body
 - a. Lit Review
 - b. Data
 - c. Methods
 - d. Research findings
4. Discussion *
 - a. Why is your research meaningful or important
5. Conclusion
6. Limitations
7. References

Remember from week 1

English writing structure is flexibility. These are PRINCIPLES not RULES.

Components to academic articles (more detailed)

1. Introduction
 - a. introduction (contextualize, explain)
 - b. Problem paragraph
 - c. Research findings and argument [often optional]
 - i. Thesis statement
 - ii. What this article does
2. Body
 - a. Lit Review
 - b. Data
 - c. Methods
 - d. Research findings
3. Discussion *
 - a. Why is your research meaningful or important
4. Conclusion
5. Limitations
6. References

Introduction

- Introduces the topic of the paper
- Moves from GENERAL to SPECIFIC information
- Contextualizes the topic and its importance
 - Broadly connects the topic to other relevant research, issues, etc.
- Usually 1-4 paragraph
 - Para 1: Contextualizes issue
 - Para 2: Problem paragraph [where is there a gap]
 - Para 3: Foreshadowing paragraph *
 - Argument, research findings, etc.
 - Thesis statements

Introduction: What NOT to do

- Do NOT add too much information about the paper itself
- Provide too much detail unnecessarily
- Provide specific information that can go in the body of the paper (specifics about methods, detailed literature review, discussion points, implications, etc.)

Examples (note some of these are better than others)

- Chen, Kim, and Yamaguchi
- Alsharif, Kim, and Kim
- Angelidou
- Nelson

Chen, Kim, and Yamaguchi

- P1: Contextualizes the situation of renewable energy in Korea, Japan, and Taiwan
- P2: Interest in renewable energy in these countries
- P3: The primary purpose of this paper is...

Alsharif, Kim, and Kim

- Paragraph 1
 - Introduce energy security in SK
 - Define energy security
 - Explain challenges to energy security in SK
- Paragraph 1/2 (where the second should be)
 - Potential solutions to achieve energy security through renewable energy
 - “Fourth Basic Plan for New and Renewable Energy”
- Paragraph 2/3
 - Government’s effort to devote attention to solar and wind energy long-term
 - Use of data to explain
- Paragraph 3/4
 - Background of Korea’s geography and wind data
- Paragraph 4/5
 - What this paper will do: discuss renewable energy opportunities and government’s potential...
 - Other parts of paper: data sources, government’s long-term plan and prospects, challenges, limitations, recommendations

Angelidou

- P1: Diverse academic interests in smart cities
 - How they are 'multidisciplinary'
- P2: Confusion about smart cities and how they are implemented
 - Theoretical problems with their development
- P3: 'What is needed is a clearer view of smart city strategies...'
- P4: This paper will...

Discussions in groups

- Do these introductions look similar or different to ones you have seen?
- Is there anything unique to papers in your field or track that is different from these?
- Comments, thoughts, questions, etc.?

Find an article in your track

- Does the introduction match what I just said
- Longer intro going into more details

THESIS STATEMENTS

- Small group discussion
- What is a THESIS STATEMENT?
- How are THESIS STATEMENTS used?
- How long should they be?
- Where should they go within the paper?

THESIS STATEMENT

- “A short statement which provides an insight into what the [paper] is going to be about” and emphasize different things:
 - Main arguments
 - Purpose
 - Point of view of author
- In academic papers, usually one paragraph at the end of the introduction
- Sometimes only appears at the end of the abstract and not in introduction
- Should be clear, precise, and explain what the paper is going to be about
- HOWEVER
 - This is NOT always the case
 - Some papers have them but do not explain the main arguments

Let's look at TS in the articles we just reviewed

- What do you notice about these?
- Is this what you expected?
- Is this common in your field?

BODY: The substance of the paper

- Literature review
- Methods and methodology
- Data
- Experiments
- Discussions (often in conclusion)
- Limitations (often in conclusion)

BODY SECTIONS: What they should do

- Provide details on the context and substance of the research
- Contextualize the research through relevant literature reviews
- Explain how research was conducted
- Provide relevant visuals to support data and arguments in the paper
- Highlight key results/findings/discussions

Examples from three papers

Conclusion (and Discussion/Implications)

- Summarizes main findings and implications of the paper
- What is most important
- How do these findings relate to other literature in the field
- What is the most important contribution of this research
- Directions for future research
- Limitations or problems with your data

Examples again

- Look at what they are doing
- What are they talking about
- What kinds of information are they including or excluding ?

NOTE

- The format is often journal and/or discipline-specific
- Consult the journal and authoritative papers in your field for reference

PART 2 START HERE

QUESTIONS?

AGAIN

- Please sit with people in your track today
- We will do random groups again next week

ACTIVITY

- Go to the **leading** journal in your track
- Find a RECENT article
- Work with other people to identify and analyze a recent article in your field (maybe track)
- Identify:
 - (1) the thesis statement
 - (2) the content in the body that supports the thesis statement
 - (3) the major implications of this research in the discussion
- Identify the important sentences/paragraphs for (1), (2), (3)

Review

Review findings together in class

BALDWIN FORMULA FOR ACADEMIC WRITING

- Ian T. Baldwin
- American ecologist
- PhD Cornell 1989
- Max Planck Institute for Chemical Ecology
- Researcher in chemical ecology
- Created this useful 'formula' for writing scientific articles

Baldwin video

- Downloaded video and slow it down a bit

DISCUSSION

- In small groups, discuss:
- 1) What do you think was the MAIN point of the video?
- 2) What did you find was the most important point of the video?
- 3) Is there anything in the video you strongly agree with?
- 4) Anything you strongly disagree with?
- 5) Other comments?

VIDEO SUMMARY GENERAL NOTES

- Writing as obligation
- Writing sharpens your thinking
- Start writing as early as possible
- Break down writing into small 'bite size' pieces
- Science writing is a FOREIGN LANGUAGE TO NATIVE SPEAKERS
- **CLARITY > ELEGANCE !!**
- Erase the memory of what you have written
 - 'Men in black solution' = forget what you wrote before

VIDEO SUMMARY THE RED LINE

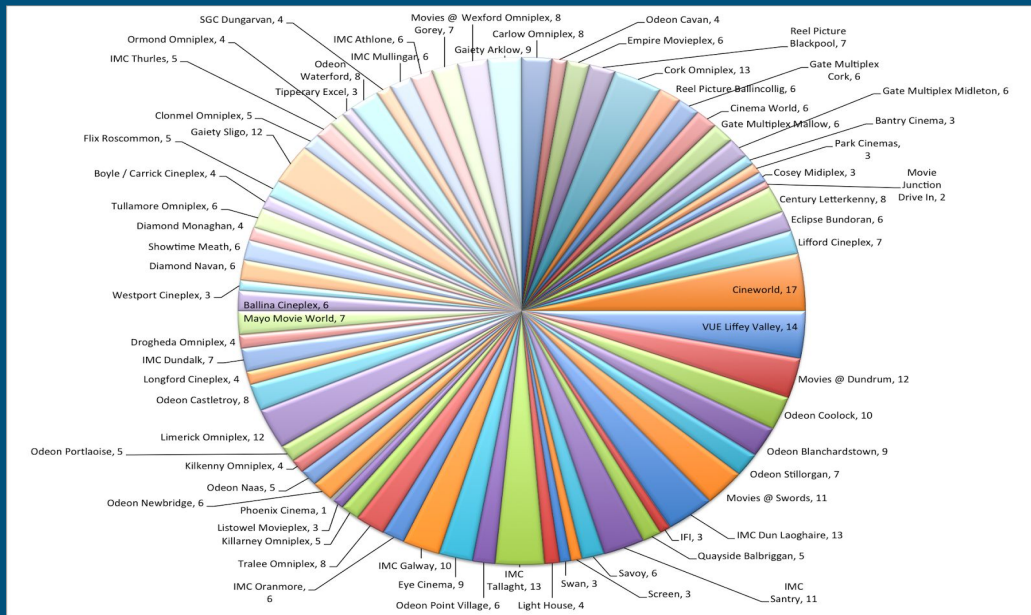
- The most important part of the paper
- Simply what the paper is about
- 1) Start with an ABSTRACT FOR YOU
 - 500 words narrative (!)
 - Logic of paper
 - Key arguments
- 2) Then write TITLE
 - Highlight keywords in abstract to create title
- 3) Figures, captions, and tables
 - Use them strategically to highlight important arguments and findings
 - Understandable in 30 seconds, draft by hand first
 - Show them to a naive colleague (or me)

Figure 4: Energy-related CO₂ emissions by sector
Million metric tons

The chart displays four data series representing different sectors. The 'Power' sector (blue line) shows the highest emissions, starting around 1850 million metric tons in 1990, peaking at approximately 2450 in 2007, and ending at about 1750 in 2017. The 'Transportation' sector (green line) shows a steady increase from 1990 to 2007, peaking at around 2000 million metric tons, and then declining to approximately 1900 in 2017. The 'Industry' sector (red line) shows a general decline from 1990 to 2007, peaking at around 1100 million metric tons, and then declining to approximately 950 in 2017. The 'Buildings' sector (yellow line) shows a general decline from 1990 to 2007, peaking at around 600 million metric tons, and then declining to approximately 550 in 2017.

Year	Power	Transportation	Industry	Buildings
1990	1850	1550	1050	550
1991	1850	1550	1000	550
1992	1850	1550	1050	550
1993	1900	1600	1050	550
1994	1950	1650	1050	550
1995	1950	1700	1050	550
1996	2050	1750	1100	600
1997	2150	1750	1100	550
1998	2200	1800	1050	550
1999	2200	1850	1050	550
2000	2300	1900	1050	600
2001	2250	1850	1000	550
2002	2250	1900	1000	550
2003	2300	1950	1000	600
2004	2350	2000	1050	600
2005	2400	2000	1000	550
2006	2350	2000	1000	500
2007	2450	2000	1000	550
2008	2400	1900	950	550
2009	2150	1850	850	550
2010	2250	1850	900	550
2011	2150	1800	900	500
2012	2050	1750	950	500
2013	2050	1800	950	550
2014	2050	1850	950	550
2015	1950	1850	950	550
2016	1850	1850	950	550
2017	1750	1900	950	550

Source: EIA, GenScape, OPIS and Rhodium Group estimates



PARTS OF PAPER [from Baldwin]

- Introduction
- Materials/methods = describe exactly how you did the experiment
 - Becoming smaller and smaller
 - Reproducibility is important
- Results
- Discussions

BALDWIN FORMULA OTHER PARTS OF PAPER:

Intro

- Start your writing with last paragraph of the introduction
- 'Here is the logic of this paper and here is what I will show.'
- Use this section to explain what you discuss in the rest of the introduction
- 'Reverse engineer' the introduction
 - Reverse engineer = start with the end and then work backwards
 - By writing this last paragraph, you can see what else you need to explain later

What is the difference between RESULTS and DISCUSSION?

BODY SECTIONS: Results are NOT Discussions

- Results
 - Explaining the data
 - Self-explanatory
 - Logic and key ideas emerge naturally from data
 - Should follow the 'red line'
- Discussions
 - Points that require elaboration
 - Not easily understood from data
 - Need to highlight inferences
 - Anticipate criticisms

Questions, comments, etc.?

Baldwin discussion

- What do you think of Baldwin's formula relative to papers in your track?
- Do you think there are any limitations of it?
- Can it be better in any way?
- Will you use it?

HOMEWORK

- Read Baldwin's longer article that is uploaded to Canvass
- We will discuss the rest of it next week

FINAL RESEARCH PAPER SUMMARY

- Due week 16
- 3500 words at least
- Proper academic paper
- Using structure we discuss in class
- Something that can possibly be publishable OR an extensive literature review of something you are interested in
- NOTE: I can evaluate structure and content, not accuracy!
- Still I hope you can publish this anyway

SOME IDEAS

- Consult with your advisors and see what might be good to do here
- Research something that you are interested in professionally or personally
- Research something that you want to use as part of your larger research
- Literature review of a part of your research
 - Previous studies
 - Interdisciplinary: combining studies from different areas
- Compare your experiments with others

FINAL RESEARCH PAPER QUESTIONS ?

Writing Workshop

- Interactive community writing activity
- Learn a simple grammar point
- Practice it
- Practice writing
- Read out loud = reading and speaking practice
- Get familiar with classmates

Writing Workshop Procedure

- Explain grammar or writing feature - 5-10 minutes
- Students write 10-15 minutes
- Students share 10-15 minutes
- Constructive feedback

Writing workshop activity: Narrative writing s academic writing

- NARRATIVE writing vs ACADEMIC writing
- NARRATIVE = personal stories, commentaries, experiences
- ACADEMIC = anything written for school or educational contexts

STYLE: NARRATIVE VS ACADEMIC

- Narrative = conversational, first person (use of I), organized in sequence, non-technical vocab, no serious references, subjective
- Academic = formal, structured around ideas (what we learned today), technical vocab, uses references and concepts, objective

Example of narrative paragraph: **What are the 'narrative' features of this para?** Discuss pairs.

"I was born in New York City to immigrant parents from Italy and Poland. As a child, I really enjoyed playing baseball with my school friends. In junior high school, I was really good at baseball. I played second base, and in one game I stopped six balls and throw out the batters. Everyone was super impressed! But when I got into high school, I stopped playing baseball. I wasn't a good student actually. Instead of focusing on my studies and athletics, I played a lot of video games and tried to find a girlfriend. I feel like I wasted a lot of time. Then, right before I went to college, I became a serious student again. My last year of high school, I got good grades and then got into a pretty good college. And now I am here, so I guess things turned out okay. Like the title of Shakespeare said 'all's well that ends well.'"

Example of narrative paragraph: What are the 'narrative' features of this para? Discuss pairs.

"I was born in New York City to immigrant parents from Italy and Poland. As a child, I really enjoyed playing baseball with my school friends. In junior high school, I was really good at baseball. I played second base, and in one game I stopped six balls and throw out the batters. Everyone was super impressed! But when I got into high school, I stopped playing baseball. I wasn't a good student actually. Instead of focusing on my studies and athletics, I played a lot of video games and tried to find a girlfriend. I feel like I wasted a lot of time. Then, right before I went to college, I became a serious student again. My last year of high school, I got good grades and then got into a pretty good college. And now I am here, so I guess things turned out okay. Like the title of Shakespeare said 'all's well that ends well.'"

NARRATIVE FEATURES

- Use of first-person (“I”)
 - Academic writing uses pronouns too but less frequently
- Use of informal words (I got, I got into, super, really)
 - Academic uses more formal and literary words
- Use of informal connectors (then)
 - More formal and literary
- Generally short sentences lacking long noun phrases

Academic writing paragraph: What are the more academic features? In pairs

Text 3-5

Science is widely recognized as a discipline that involves the empirical work of observing, manipulating, and experimenting with the material world (Yore, Bisanz & Hand, 2003). At the same time, however, it is also a form of discourse involving argument (Kuhn, 2010; Osborne, 2010). Scientists use language and other semiotic resources such as graphs, charts, pictures, diagrams, and sonograms to record, describe, classify, explain, model, and theorize the natural phenomena. They use evidence gathered from their reading, observation, and experiment to make their case for new ideas or alternative interpretations. These ideas or interpretations are in turn subjected to scrutiny and critique by the scientific community and the public. For example, a study by Yore, Hand, and Florence (2004) found that scientists engage in many different types of writing in their daily work, including journal articles, grant proposals, manuscript reviews, seminars, reports, essays, emails, lab notes, field notes, and lecture notes.

Academic writing paragraph: What are the more academic features?

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Academic writing features

- Academic writing usually uses OBJECTIVE PROSE
 - No use of first person
 - Abstractions of groups (scientists; they; these)
- Formal connectors (however (not but); for example)
- Long noun phrases to convey dense meaning
- Formal vocabulary (widely recognized)

Examples of non-academic and academic vocabulary

Formal and Informal Vocab			
Informal	Formal	Informal	Formal
anyways	nevertheless	think about	consider
break down	fail	put in	insert
break off	suspend	a lot of	numerous
blow up	explode	make out	discern
thanks	gratitude	look like	resemble
put off	postpone	look at	examine
go before	precede	lots of	much, many
bring about	cause	look for	seek
mend	repair	look into	investigate
make up	fabricate	need to	required
put up	tolerate	stand for	represent
WWW.MECHMASS.ORG			

Informal & Formal Words	
Informal	Formal
Ask	Enquire
Tell	Inform
But	However
Get	Receive
Bad	Negative
Seem	Appear
Also	Moreover
Buy	Purchase
Have to	Must
End	Finish
Lack	Deficiency
Live	Reside
Lively	Energetic
Hurt	Damage
Put in	Insert
Check	Verify
Sorry	Apologize
Help	Assist
Chance	Opportunity
Use	Utilize
  lessonsforenglish.com	

NOTE

- We will discuss these more in the future, don't worry about memorizing these now

QUESTIONS?

Writing workshop activity PLEASE WRITE AND UPLOAD LATER - Don't worry about spelling, etc.

- Write about your personal academic background
- This might include...
 - Where did you go to high school?
 - What did you study as an undergraduate?
 - What memorable experiments did you?
 - Research, grants, jobs, etc.?
- Or other things too

Time for writing in class

Reading and sharing

- Read your story to your group mates
- Group mates consider:

1. What features of narrative writing does the speaker use?
2. Is the writing in a casual tone that is common in narrative?
3. Does the speaker write in the first person?
4. Is it easy to understand? Or are there too many technical terms or vocabulary?
5. Is it interesting? (narrative should be interesting =)]
6. Can you feel the subjective aspects of the writing (vs. objective)?

Homework

- READ: Baldwin formula for writing a scientific paper and reviewing papers
- WRITE: Write a 300-500 word research topic of the final paper
 - What topic are you interested in?
 - How are you going to find this information?
 - How will you use this information?