Part III - Structure

Providing Transition, Depth and Emphasis


Transitions

- Transitions are critical to lead the reader through your organizational strategy & to get your points across
  - Between sections
  - Between paragraphs &
  - Between sentences (Part IV)

Section Transitions

- Having set up an organization with sections, there have to be transitions between the sections so the reader understands how sections are related
- **Mapping sections**
  - Presenting the name of the sections in an explanatory list (like a table on contents) just before the sections

Paragraph Transitions

- Words or phrases should link paragraphs to create a smooth flow between them
  - Repeat the same word from the last sentence of the previous paragraph to the first sentence of the next
  - Use a similar word in the first sentence of the next paragraph to one in the last sentence of the previous paragraph
  - Use a detail from the previous paragraph in the next one
  - Use introductory works like: in addition, meanwhile, because, since, nevertheless, however, etc.

Transitions to Avoid

- Empty beginning – waste the first sentence without saying anything significant
  - Many people are interested in global warming
- Begin with details that are too specific
  - Oxygen isotopic data from Antarctic ice cores on the Ross Ice Shelf range from ...
- Begin with a statement that is too general
  - Global warming is a world-wide problem
Eliminate Sentence Discontinuities with Transition Bridges

- Discontinuities are typically a result of poor transitions between ideas:
  - Use conjunctive words early in a sentence to make strong transitions from previous sentences (although, however,...)
- Transitional words signal one of three things:
  - Movement of ideas will continue in the same direction
    - Also, moreover, first...second... third
  - Movement of ideas will pause
    - For instance, for example, in other words
  - Movement of ideas will reverse
    - However, on the other hand, conversely

Depth of Details

- Depth includes the way you classify, analyze, and assess details
  - Level 1 – classification & organization of data
  - Level 2 – analyze data for significance
  - Level 3 – assess the validity of analysis
- Audience determines level of detail
  - Interest of the audience
  - Technical level of the audience
  - Purpose for the audience (info vs persuasion)
- Parallel depth of discussion of related topics

Emphasis of Details

- Details need to be presented so that the reader understands their relative importance
- Four ways to emphasize:
  - Repetition
  - Wording
  - Illustration
  - Placement

Emphasizing Details with Repetition

- Repeating important results in different sections of the paper – in the abstract, summary and conclusions, for instance
- Increases the likelihood that the reader will recall important details
- Contrast repetition with redundancy
  - redundant – containing material that is predictable from its context (It was late in the month of July vs. It was late July)

Emphasizing Details with Wording

- To emphasize important details, sentences should explain why the details are important
- Rather than giving details in a sequence of prepositional phrases (above the lake, along the shore, under the ledge), which give equal emphasis, use dependent clauses and infinitive phrases
- Dependent clauses begin with introductory words such as: because, since, as, although, when
  - Although most of the gneisses were granitic, we recognized several interlayers of mafic gneiss
- Infinitive phrases are verb phrases that begin with the word “to”
  - To make sure we recognized all of the mafic gneisses, we conducted traverses at 100-meter intervals.
- These help show the relative importance of details
- Inverse word order also emphasizes the details in both of the example sentences
Emphasizing Details with Illustrations

- Readers may not read every sentence, but they will usually look at your illustrations.
- If possible, put important results in an illustration.
- Always integrate your illustrations into your text for emphasis of the text.
- Overuse of illustrations dilutes their ability to emphasize.

Emphasizing Details with Placement – Sentences & Paragraphs

- Text that borders white space has more emphasis than text surrounded by words.
- Titles and headings.
- Beginning and end of sections or paragraphs.
- Just before or after figures.

Emphasizing Details with changes in sentence & paragraph length

- Changes in the length of sentences and paragraphs.
  - Short sentences or paragraphs following long sentences or paragraphs receive emphasis.
  - We hiked about five miles over rugged terrane and forded two streams before arriving at the mine around dusk.
  - It was flooded.

Emphasizing Details with Placement – Items in Lists

- Lists of important information should be short, prioritized and placed for emphasis.
- Consider using numbers or first, second etc.
- Consider a vertical listing (use sparingly).
- Consider shortening a list to two or three important points followed by a list of secondary points or recommendations.

Part IV - Language

Being Precise, Clear, Forthright, Familiar, Concise and Fluid


Being Precise – Saying what You Mean

- One of the most important goals of language in scientific writing.
- Involves two aspects of language:
  - Choosing the right word - usage.
  - Choosing the appropriate level of accuracy.
Choosing the Right Word

- Understand the correct use of similar meanings:
  - Comprise vs compose
  - Affect vs effect
  - Continual vs continuous
  - Principle vs principal
  - See also Appendix B of Alley (1996)

Choosing the Right Level of Detail

- Balance general statements with specific statements
  - General statements establish the direction of thought
    - Global warming may lead to major changes in sea level
  - Specific statements give evidence to support the thought
    - Studies have already shown that many of the Antarctic glaciers have undergone extensive melting between 1928 and 2004

Choosing the Right Word

- Avoid using word grouping with no meaning:
  - Centers around, revolves around
- Avoid using words as synonyms that are not exact synonyms
  - Classified – secret – mysterious – unidentified – unclassified

Choosing the Right Level of Detail

- General statements by themselves do not leave an impression, they only set up the context for details
- Too many details without a context confuses your reader or makes for tiresome reading
- Choose only useful details

**Being Clear – Avoiding Things that You Don’t Mean**

- Two things make writing unclear
  - Needless complexity of words
  - Needless complexity of phrases
  - Needless complexity of sentences
  - Ambiguity

**Needlessly Complex Words**

- Are the words precise?
- Are the words clear?
  - If so, use them; if not find simpler substitutes
- Suspect words end in ize,
Needlessly Complex Phrases

- Are commonly a result of strung together
  modifiers preceding the noun
  - "Critically important aspects of the fluorescent dye tracer testing procedures resulted in a very unfortunate failure of our experiment."
  - "Problems with our dye tracer procedures caused the experiment to fail."
- Complexity dilutes the significance of the modifiers because they get lost in the phrase
- Complexity can reduce the precision of the sentence

Needlessly Complex Sentences

- Long sentences test a reader's patience, but not all long sentences are complex
- Convoluted sentences are a bigger problem
  - Too many prepositional phrases
  - Too many ideas
- Every sentence should have just one main idea

Spotting Complex Sentences

- Does the sentence have more than one idea?
- Do you notice that the sentence is long
  - In a good long sentence you don't notice the length
- How clear would it be to you as the reader
  - Imagine yourself sitting across from your most important reader
  - Write your paper as if you were talking to that reader
- Get rid of needless formality and complexity
  - Your purpose is to inform, not to impress your reader with needlessly formal or complex wording

Avoid Ambiguity

- Ambiguity occurs when a word, phrase or sentence can be interpreted in more than one way
- You are most likely to recognize ambiguity when you are revising your writing several days after having written it
  - You are more likely to recognize ambiguity as a reader than as a writer
  - Print out a draft rather than reviewing it only on a computer screen

Types of Ambiguity

- Ambiguity of word choice
  - Many words in English have multiple meanings
    - "I parked down the street about two meters" 
- Ambiguity in syntax
  - Syntax refers to the order and structure of word or phrases in a sentence
    - "The geologists left the campsite dirty"
- Ambiguity of pronouns
  - There should be no doubt as to what the pronoun refers
    - Be careful using "it" and "this"
    - "I stepped onto the rocky ledge and hit the rock with the pointed end of my hammer. This was a dangerous thing to do."
- Ambiguity of punctuation
  - Commas cause the most ambiguity
    - Mandatory commas – used to keep a sentence from being misread
      - For instance, following an introductory phrase
        - Commas with "and" or "or" in sequences of three or more (serial comma)
          - We went to a dry cleaners, a hardware, and grocery store.
Language: 
*Being Fortright*

- When you are forthright you are:
  - Sincere, straightforward
  - You use strong nouns and verbs
- You control this with the “tone” of your writing
- Tone is the part of your language that indicates your attitude toward your subject

**Controlling Tone**

- Avoid pretentious words that are likely to smack of a “pseudo-intellectuality”
  - facilitate, implement, interface, component, utilize
    - To facilitate and implement our business marketing interface, we utilized lettered plastic components on the office door.
    - To let people know about our business, we put up a plastic sign on the office door.
- Avoid arrogant phrases
  - as is well known, of course, clearly demonstrate, unambiguous, it is obvious that
- Avoid clichés
  - Rat race, bundle of nerves, ...

**Choosing Strong Nouns & Verbs**

- A noun is strong if it invokes one of the five senses in a reader (concrete nouns)
  - touch, smell, taste, hearing & vision
- Abstract nouns do not invoke the senses
  - ability, approach, capability, concept, factor, nature, parameter

**Strong Verbs**

- Avoid verb phrases in favor of active verbs
  - arranged vs made arrangements for
  - decided vs made the decision
- Words that indicate the natural action of the sentence are the best verbs
- Don’t bury strong verbs with verb “to be”
  - begins vs is beginning
  - detects vs is used to detect

**Active vs Passive Voice**

- In most cases, sentences are more straight forward if the subject completes the action of the sentences (active voice) rather than being acted upon (passive voice)
  - The seismometer recorded the earthquake
    - "recorded" is an active verb
  - The earthquake was recorded by the seismometer
    - "was recorded" is a passive verb construction
- General rule: let subjects do the things they were made to do

**Passive Voice to Avoid First-Person References**

- We analyzed the samples for gold. vs
  - The samples were analyzed for gold.
- Use of the first person is fine as long as the emphasis remains on your work and not on you.
Language – Being Familiar

- Use terms that are familiar to your primary audience.
- Avoid unnecessary jargon
- Define unfamiliar terms if necessary
- Define acronyms the first time they are used
  - X-ray computed tomography (CT) will revolutionize rock textural studies.

Incorporate Examples and Analogies

- Whenever you make a general statement, you should anchor the statement with examples.
  - Color is not a good property to use to identify a mineral. For instance, quartz...
- Analogies compare obscure thoughts, features, or processes to familiar ones

Language – Being Concise

- Being concise usually follows from being clear and being forthright
- Four ways to cut the fat in scientific writing
  - Eliminate redundancies
  - Eliminate meaningless phrases (zeros)
  - Reduce sentences to their simplest form
  - Cut bureaucratic waste

Eliminate redundancies

- Redundancies occur when you:
  - Repeat the meaning of an earlier expression
  - (completely) eliminate, mix (together), (still) persists
  - Make a point that is implicit in what has already been stated
    - aluminum (metal)
- Catch redundancies by reading to eliminate words

Eliminating Writing Zeros

- Writing zeros are phrases that have no meaning and offer no information to the reader:
  - It is interesting to note that...
  - The presence of...
  - In the course of...
  - I might add that...
  - As a matter of fact...

Reducing a Sentence to Its Simplest Form

- This does not mean limiting yourself to simple sentences
- It means using only the necessary words in whatever sentence structure you choose, be it simple, compound, or complex
Reducing a Sentence to Its Simplest Form

- Eliminate fat phrases
  - At this point in time = now
  - In the vicinity of = near
  - In the event that = if
- Eliminate overused adjectives or adverbs that don’t serve a purpose in your sentence
  - Comprehensive, detailed, fundamental, somewhat, rather, very, pervasive are commonly overused or unnecessary

Reducing a Sentence to Its Simplest Form

- Eliminate nouns containing verbs
  - Establishment, measurement, development
- Eliminate needless passive voice
  - It was concluded that...

Eliminating Bureaucratic Waste

- Eliminate the use of empty bureaucratic nouns
  - Target, parameter, development
- Think about the interest of your principal audience
  - Consider what your audience wants to learn from your document
- Eliminate things that are superfluous
  - Concise writing is forceful and helps your audience focus on what you say
  - Fat writing is lethargic and allows your reader’s mind to wander from your text

Language – Being Fluid

- Fluid writing uses variations in:
  - Sentence rhythms
  - Sentence lengths
  - Sentence structure
  - Paragraph length
    - to lead the reader through the text
- Fluid writing - eliminate discontinuities by
  - Providing smooth transitions between ideas
  - Providing a smooth visual format

Varying Sentence Rhythms

- Sentences that have the same kind of beginning, same length, the same noun, verb, and phrase arrangements are boring to read and can make your subject boring.
- Vary rhythms by changing the way sentences begin, the way they end, the position of subjects and verbs, their length, and their complexity (see Alley, p. 130-137)

Summary

- Read your textbook assignments!
- So, what was the message?
Stages of the writing process

- Getting in the mood
  - Preparing to write
- Writing the first draft
  - Thinking & writing
- Revising, revising, revising
  - Rewriting
- Finishing
  - Attending to layout/format

Think Before You Write
(note just while you write)

- Think about your audience
- Think about your purpose
  - And strategies for achieving it
- Think about your style
  - Structure
  - Language
  - Illustrations

Who is your audience?

- Your boss, a client, co-worker?
  - Management (your professor?)
- Your answer determines
  - Your choice of words
  - The detail of illustrations you can present
  - The depth of your presentation
  - The kinds of bridges that you have to construct for your audience from known information to new information

Purpose of the Document

- Informing
- Persuading

Strategies to Fit Your Purpose

- Types of strategies:
  - Chronological – used in discussions of timeline or cyclic processes
  - Spatial – to follow the pattern of a physical form
  - Flow – to follow the change in some variable through a system
  - Cause and effect
  - Division and classification

Writing Style

- Style is the way that you put your thoughts into words and images. Includes, for example:
  - The way you emphasize details
  - Sentence length and structure you use
- Three basic elements of style:
  - Structure
  - Language
  - Illustration
Their Functions

- **Beginning** - prepares the reader for the middle by fulfilling certain expectations:
  - Defines the work to be described
  - Indicates why it was done
  - Gives background for understanding the work
  - Indicates how the work will be presented
- **Middle** - presents the work
- **End** - provides analysis, summary, and future perspectives

Illustrations

- **Illustration**
  - The meshing of figures and tables with language
  - Illustrations make your writing efficient by clarifying concepts that are too complex to be conveyed by language alone
  - Used for emphasis
  - Used for detail
  - Use may be governed by format constraints

Six Goals of Language

- **Your writing should be:**
  - Precise
  - Clear
  - Forthright
  - Concise
  - Familiar
  - Fluid