

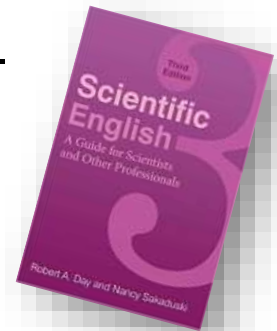
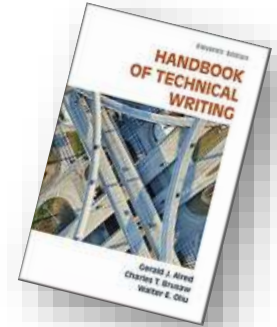
Routine Communications / Writing for Understanding

ENGR 361: *Scientific Research Communication*

<https://www.csulb.edu>

References

- Alred, G. J., Brusaw, C. T., & Oliu, W. E. (2009). *Handbook of technical writing*. Macmillan.
- Day, R. A., Sakaduski, N., & Day, N. (2011). *Scientific English: A guide for scientists and other professionals*. ABC-CLIO.
- Boiarsky, C. (2014, October). Will we ever learn: Case studies of rhetorical errors and effective rhetorical strategies in written communication-from the challenger accident to the BP/Horizon Oil Rig disaster to the 2011 Mississippi flood. In *Professional Communication Conference (IPCC), 2014 IEEE International* (pp. 1-13). IEEE.



Scientific Communication

Write for Understanding

- Write/speak with the reader/hearer in mind



- Can you list different types of scientific writing?

Scientific Communication

Write for Understanding

- Who is the audience?
- How does the writing change?
 - Book
 - Textbook
 - Scientific Blog
 - Technical Report
 - Original Research
 - Review Article
 - Experimental Protocol
 - Research Report
 - Data Logging
 - Grant Proposal



Scientific Communication

Write for Understanding



Scientific Communication

Write for Understanding



Scientific Communication

- Proper language and structure promotes understanding
- Effective communication of science requires the use of words with clear meaning

Importance of words and structure ... { Clear
Simple
Well ordered

In-Class Activity

Paper Discussion

Will We Ever Learn: Case Studies of Rhetorical Errors and Effective Rhetorical Strategies in Written Communication—From the Challenger Accident to the BP/Horizon Oil Rig Disaster to the 2011 Mississippi Flood

Carolyn Boiarsky
Purdue University Calumet
boiarsc@comcast.net

In-Class Activity

Paper Discussion

- Separate into 5 groups. Each group will lead the discussion for one of the situations described in the paper.
 - Chicago Flood of 1992
 - Columbia disaster
 - Challenger disaster
 - BP/Horizon Gulf Oil Rig explosion
 - Mississippi flood
- Prepare to address the following:
 1. The situation
 2. Method of communication used
 3. Relationship between the writer and the reader
 4. Message that needed to be delivered (as understood by the writer)
 5. Message that was delivered (as interpreted by the reader)
 6. Failures in the message delivery
 7. How this situation would be similar in your field/area of research?

In-Class Activity

Paper Discussion

■ Challenger Disaster Letter

- *On January 28, 1986, the American shuttle orbiter Challenger broke up 73 seconds after liftoff. The disaster claimed the lives of all seven astronauts aboard, including Christa McAuliffe, a teacher from New Hampshire who had been selected to join the mission and teach lessons from space to schoolchildren around the country.*



In-Class Activity

Paper Discussion

■ Chicago Flood Memorandum

- *The Chicago flood occurred on April 13, 1992, when the damaged wall of a utility tunnel beneath the Chicago River opened into a breach which flooded basements and underground facilities throughout the Chicago Loop with an estimated 250 million US gallons of water.*



In-Class Activity

Paper Discussion

■ Columbia Disaster PowerPoint Presentation & E-mail

- *On February 1, 2003, the Space Shuttle Columbia broke apart while re-entering the atmosphere over Texas, killing all seven crew members on board. An investigation later determined the catastrophe was caused by a problem that took place shortly after launch on January 16, when a piece of foam insulation broke off from the shuttle's propellant tank and damaged the edge of the shuttle's left wing.*



In-Class Activity

Paper Discussion

■ The BP/Horizon Oil Rig Email Messages

- *On April 20, 2010, an explosion on the Deepwater Horizon Macondo oil well drilling platform started the largest marine oil spill in U.S. history, releasing millions of barrels of oil into the Gulf of Mexico.*



Reader–Centered Communication

Criteria	Rubric
Considers Reader's Prior Knowledge, Needs and Wants	

In-Class Activity

Paper Discussion

- Failures in written communication
 - Chicago Flood of 1992
 - Columbia disaster
 - Challenger disaster
 - BP/Horizon Gulf Oil Rig explosion
- Engineers lacked rhetorical strategies to counter the culture of an organization and challenge managerial decisions
- Documents were writer- rather than reader-based

In-Class Activity

Paper Discussion

- Ineffective Communication
 - Failure to include sufficient content and to organize and sequence the information so that readers can understand the message and make appropriate decisions
 - Failure to recognize the readers' needs, wants, processes, and styles is evident

In-Class Activity

Paper Discussion

- Effective communication
 - Mississippi flood
- Writers used rhetorical devices that considered the reader's knowledge and reading processes

Writing Reader-Based Texts Writing with the Reader In Mind / Personal Statements


ENGR 361: Scientific Research Communication

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References

- Alred, G. J., Brusaw, C. T., & Oliu, W. E. (2009). *Handbook of technical writing*. Macmillan.
- Day, R. A., Sakaduski, N., & Day, N. (2011). *Scientific English: A guide for scientists and other professionals*. ABC-CLIO.
- Hewitt, M. (2007). How to Search and Critically Evaluate Research literature. The NIHR Research Design Service for the East Midlands / Yorkshire and the Humber.





Capture your reader,
let him not depart,
from dull beginnings
that refuse to start

Horace

“Based on the microhomologies identified at breakpoint junctions, the apparent template driven insertional complexities at breakpoints, and the fusions of distantly distributed sequences in complex genomic rearrangements, a replication based mechanism, the fork stalling and template switching (FoSTeS) model, has been proposed to explain the formation of such rearrangement complexities in the human genome.”

Liu P, et al (2011) *Cell* 146:889-903

(54 words, but who's counting?)

What Readers Do When They Read

- Readers construct meaning
 - How is the term “DNA” understood by a...
 - 7th grader?
 - High school junior?
 - Senior biology major?
 - Molecular biology researcher?
 - Wall Street commodities broker?



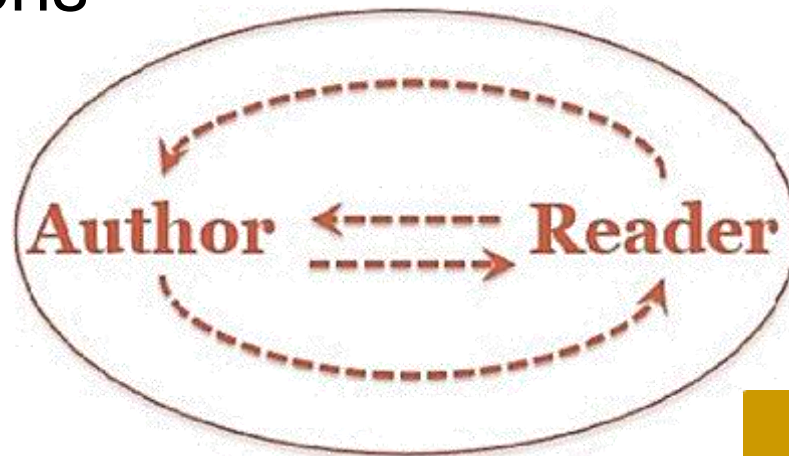
What Do Reader Do When They Read

- Readers construct meaning
- Readers respond according to their situation
- Readers react moment-to-moment



The Writer – Reader Connection

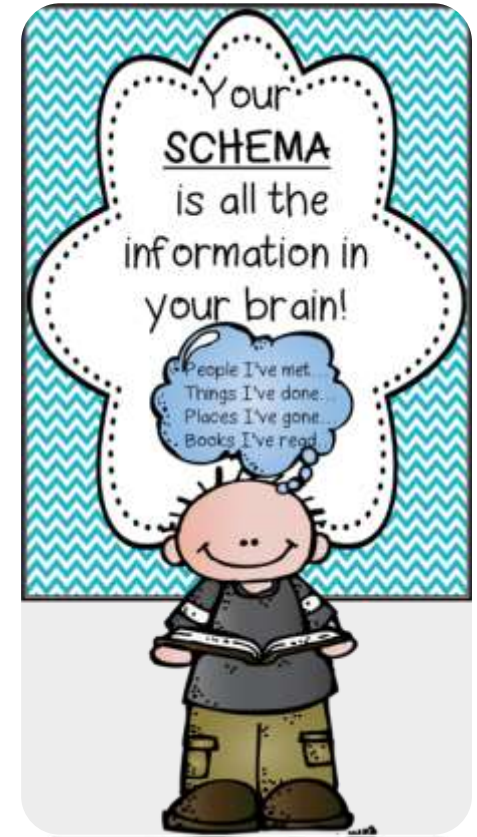
- When readers read critically, they are asking questions, making observations, and constructing interpretations of the information they are reading
- A writer fulfills the pact with the reader by addressing these questions, observations and interpretations



Writer's and Reader's Schemata

Schema Theory

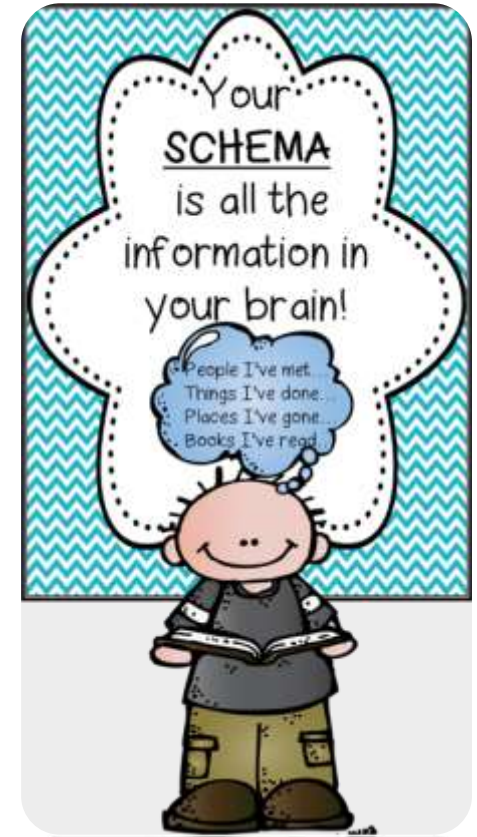
- Knowing something about a subject makes it easier to learn more about that subject
- Our prior knowledge serves as a framework which makes the new information more meaningful and easier to absorb



Writer's and Reader's Schemata

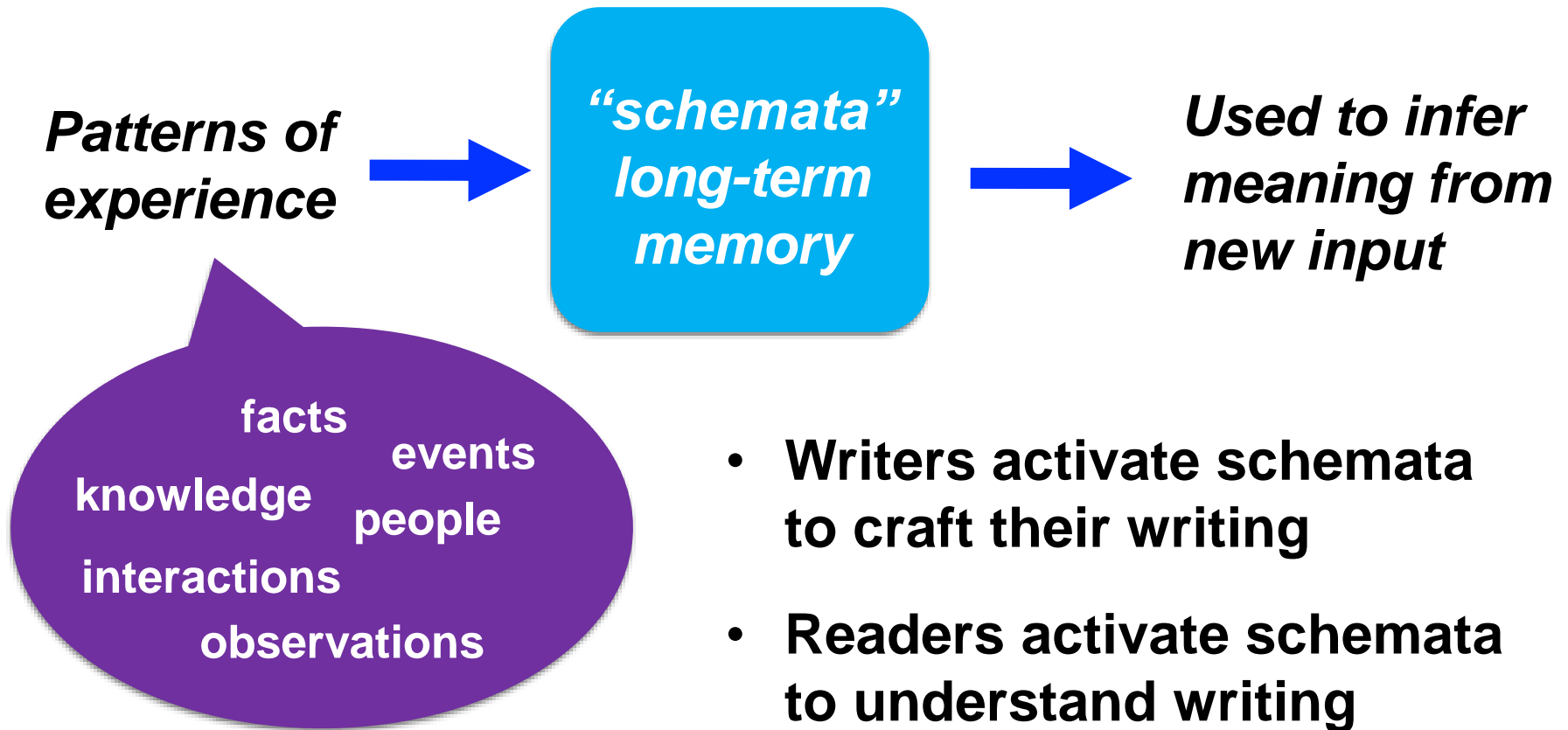
Schema Theory

- The human mind routinely constructs, on the basis of patterns of experience, abstract generic concepts or “schemata”
- These schemata are stored in long-term memory and thereafter guide the way we perceive and remember things



Writer's and Reader's Schemata

Existing knowledge/framework: Schemata



Writer's and Reader's Schemata

- What do you know about your target audience?
- Writer must know as much as possible about the reader's background

I was talking to one of the writers about our target audience, and he was insulted that I used that term. But if you're given \$60 million to make a film, you'd better know who your target audience is. That's who's going to pay back the bills you run up.

Michael Bay

QuoteAddicts



CALIFORNIA STATE UNIVERSITY

LONG BEACH

Schema Activation

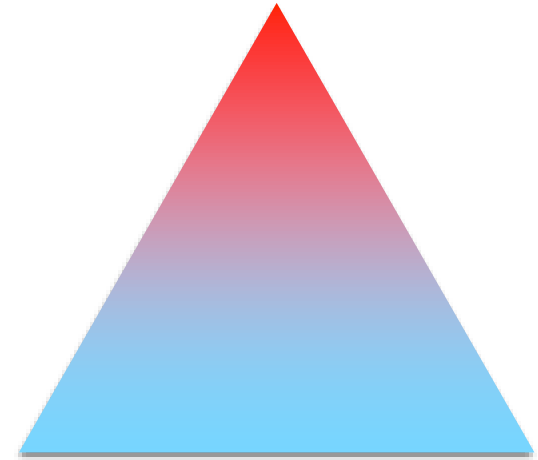
- “...for prior knowledge to aid comprehension, it must become an activated semantic context.”
 - Writer must alert reader to activate prior knowledge
- This previewing helps us remember any knowledge related to the topic to make a stronger association

Schema Activation

- Introduce your topic vividly
- Introduce an interesting fact
- Ask a question
- Use a quotation
- Introduce a short story
- Start with a surprising statement

“It usually takes me more than three weeks to prepare a good impromptu speech.” – Mark Twain

What Do Readers Do When They Read



Levels Effect: “hierarchy”

Most important information should be stated up front
Easier for reader to understand, recall

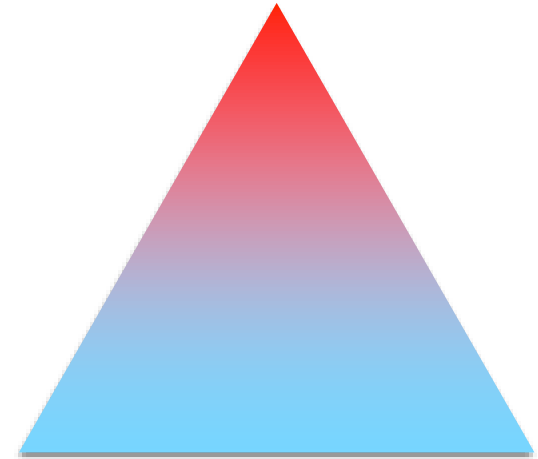
What Do Reader Do When They Read



Levels Effect: “hierarchy”

**Most important information
should be stated up front**

*Easier for reader to
understand, recall*



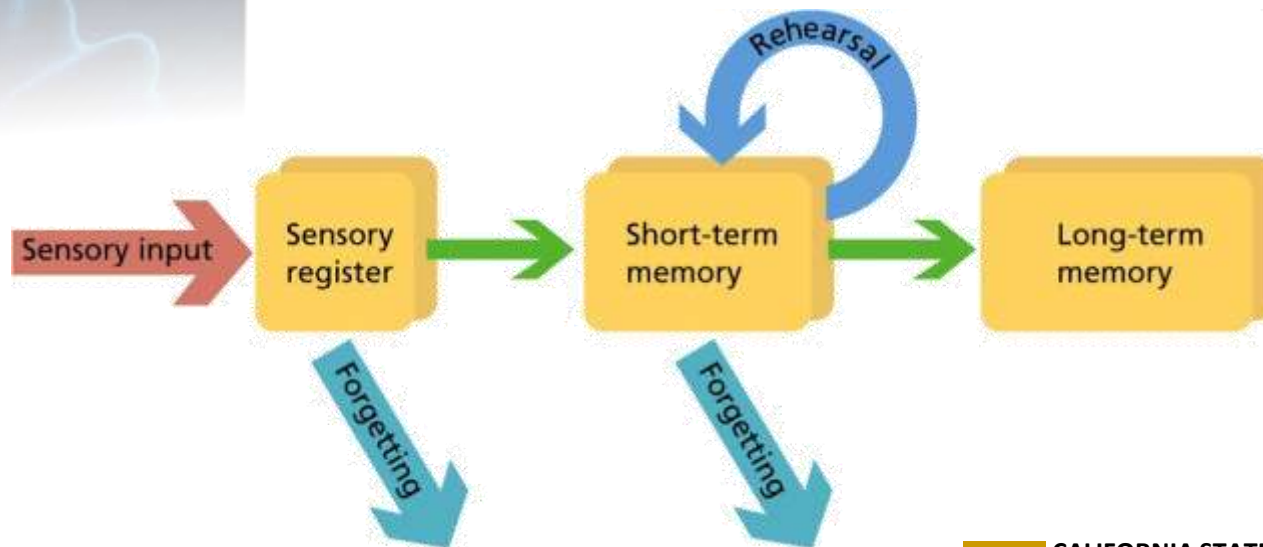
- 1.0 → ON THE INSERT TAB
- 1.1 → the galleries include
- 1.1.1 → items that are designed
- 1.1.1.1 → to coordinate with the
- → overall look of your document
- 2.0 → YOU CAN USE THESE
- 2.1 → galleries to insert tables
- 2.1.1 → headers, footers, lists
- 2.1.1.1 → cover pages, and other
- → document building blocks

- Positions of superior hierarchy:
 - headings
 - sub-headings
 - topic sentences

How Do Reader Store Information



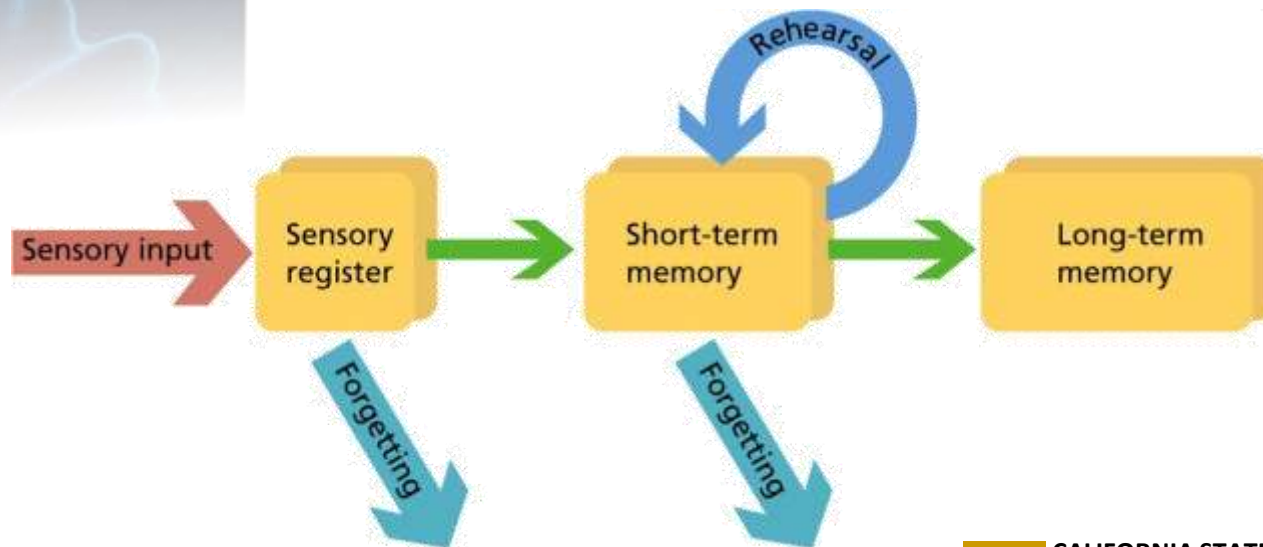
- Long-Term Memory: Stores Schemata
- Short-Term Memory: ~ 7 'chunks' of info
 - *'Stuff' in Short-Term memory must be restated for it to persist*



How Do Reader Store Information



- Long-Term Memory: Stores Schemata
 - Short-Term Memory: ~ 7 '*chunks*' of info
 - Height in Presentation
 - Frequency of mention
- Learning capacity of information



What Do Readers Do when They Read

- Reader Variables
- Reader's familiarity with subject matter
 - Specialist vs. non-specialist activates appropriate schemata differently
 - Intro alerts reader to terminology, which schema to activate



What Do Readers Do when They Read

- Reader Variables
- Optimal communication happens when there is a 50/50 mix of known and unknown information



What Do Readers Do when They Read

■ Reader Variables

■ Reading Style Used by Reader

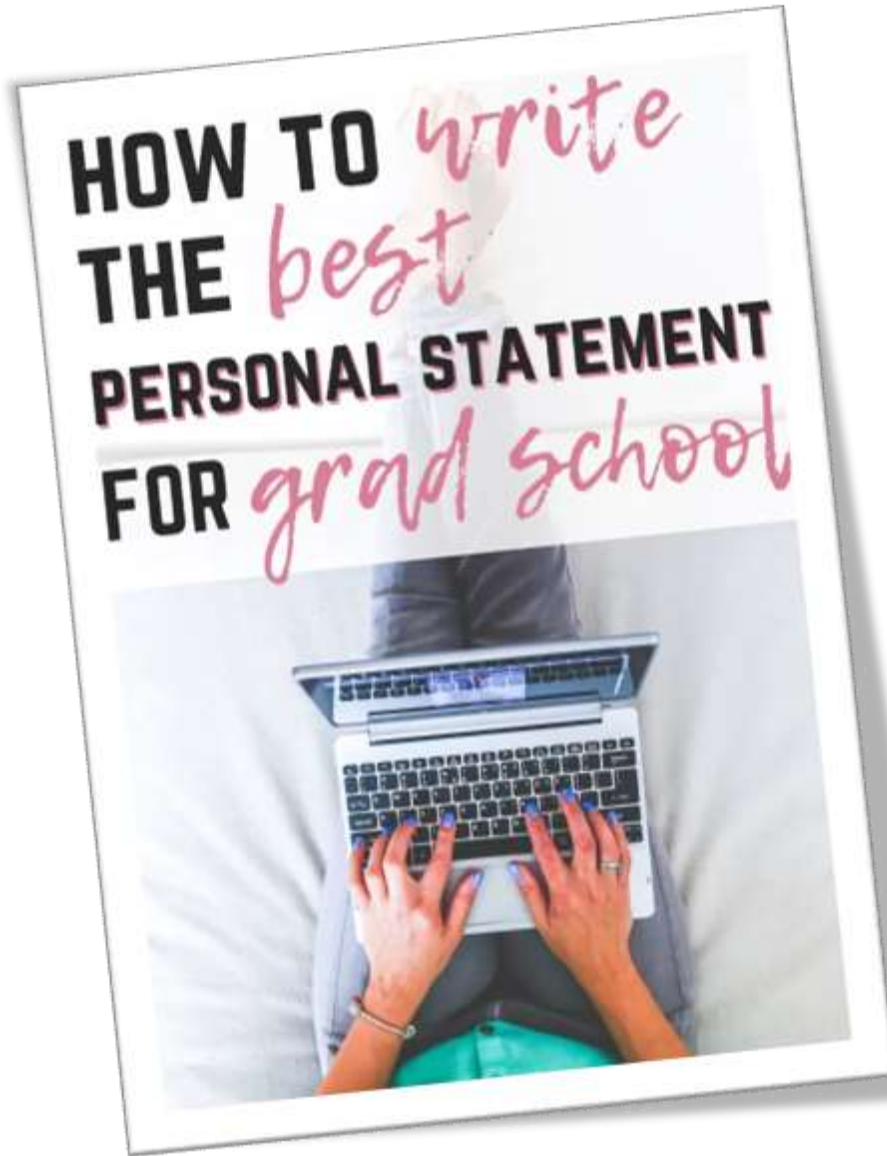
- **Skimming:** general drift of passage
- **Scanning:** rapid looking for key terms
- **Searching:** attention to meaning of specifications
- **Receptive:** for thorough understanding
- **Critical:** for evaluation



Readability Guidelines

1. State purpose explicitly
2. Make topic of each section visually prominent
3. Reference topic frequently—subject hierarchy in sentences
4. Anticipate reading style of reader (skimming, scanning, etc.)
5. Organize writing to highlight most important information to the reader
6. Be consistent with terminology
7. For non-specialists, use frameworks they understand to explain information they don't understand
8. For specialists, do not over-explain

Personal History Statement



Assignment 3 – Personal Statement

Write a Personal History Statement

A Personal History Statement is required for all applicants to the One State University graduate program. In your Personal History Statement, please discuss how your personal background—including any relevant educational, familial, cultural, economic, or social experiences, challenges, or opportunities—informs your decision to pursue a graduate degree. Please describe your career goals, your research interests, and your experiences that prepared you to become an outstanding researcher. Describe how/why you think the OSU graduate program and its faculty can help you to achieve your research and career goals.

- First Draft: Include a header with your name, location, contact information. No more than 2-pages doubles spaced. Submit a *.docx file to BeachBoard.
- Final Draft: Include a header with your name, location, contact information. No more than 2-pages doubles spaced. Submit a *.docx file to BeachBoard.

Personal Statement

- Opportunity to describe yourself for the Admissions committee
 - Your goals and passions
 - What you will bring to the program
 - What you are hoping to get out of the program
- Highlight significant things about you that do not appear elsewhere on your application

Personal Statement –vs– Statement of Purpose

- **Statement of Purpose (SOP)** also can be called a **Letter of Intent (LOI)**
 - Focused on your academic or professional credentials and your future research and/or professional interests
- **Personal Statements** also addresses your academic experiences and goals
 - Can be more personal

Personal Statement and/or Statement of Purpose

- Some programs ask for both a Personal Statement and a Statement of Purpose
 - The **Personal Statement** is more focused on your life experience
 - The **Statement of Purpose** will focus on your academic/research experiences and goals



Personal Statement and/or Statement of Purpose

- Not always a large difference between a personal statement and a statement of purpose
 - Both statement types should address a lot of the same themes (future goals and the valuable assets you bring to the program)
 - Some programs will ask for a personal statement but the prompt will be focused primarily on your research and professional experiences and interests
 - Some will ask for a statement of purpose but the prompt will be more focused on your general life experiences

Personal Statement

- What makes a good Graduate School Personal Statement?
 - Clear narrative
 - Be Specific! Provide specific examples
 - Why you are a good fit
 - Strong Writing
 - (Appropriate Boundaries)

Personal Statement

- **Clear Narrative**

- Clearly communicate what makes you a strong applicant
- Provide information supporting your likely success in graduate school
- While drafting your Personal Statement
 - Think about a couple of key points that you want to communicate about yourself
 - Determine how you can best communicate those points

Personal Statement

■ Clear Narrative

- Decide whether to address setbacks or gaps in your application
 - Have a low GPA for a couple semesters from a health issue?
 - Been out of a job for a while taking care of a family member?
- Make sure that the overall arc is more about demonstrating positive qualities like resilience and diligence than about providing excuses

Personal Statement

■ **Specific Examples**

- Use specific examples to support application
- Anecdotes that demonstrate particular traits
 - Just saying “I love plants,” is vague
 - Describe how you worked in a plant lab during undergrad and then carefully cultivated your own greenhouse where you cross-bred new flower colors by hand
 - Much more specific and descriptive, which makes for better evidence

Personal Statement

■ A Good Fit

- Describe why you are a good fit for the program
- Describe why the program is a good fit for you
- Do your research...
 - Identify specific things about the program that appeal to you
 - How you'll take advantage of those opportunities?
 - Mention specific professors you might be interested in working with

Personal Statement

■ Strong Writing

- All science require some writing
 - Important that your personal statement shows strong writing skills
 - Communicating clearly
 - No grammar or spelling errors
 - Proofread and ask others to Proofread
- Avoid clichés and gimmicks
- Do not deploy overused phrases like “ever since I was a child”
- Do not structure your statement in a gimmicky way

Personal Statement

■ **Appropriate Boundaries**

- Do not overshare anything too personal about relationships, bodily functions, or illegal activities
- Do not share anything that makes it seem like you may be out of control, unstable, or an otherwise risky investment
- No political or religious views
- If you share inappropriately, you may seem like you have bad judgment (red flag to admissions committees)
- You should also be careful with how you deploy humor and jokes

Personal Statement

- Questions to ask yourself before you write
 - What's special, unique, distinctive, and/or impressive about you or your life story?
 - What details of your life (personal or family problems, history, people or events that have shaped you or influenced your goals) might help the committee better understand you or help set you apart from other applicants?
 - When did you become interested in this field and what have you learned about it (and about yourself) that has further stimulated your interest and reinforced your conviction that you are well suited to this field? What insights have you gained?
 - How have you learned about this field—through classes, readings, seminars, work or other experiences, or conversations with people already in the field?

Personal Statement

- Questions to ask yourself before you write
 - If you have worked a lot during your college years, what have you learned (leadership or managerial skills, for example), and how has that work contributed to your growth?
 - What are your career goals?
 - Are there any gaps or discrepancies in your academic record that you should explain (great grades but mediocre LSAT or GRE scores, for example, or a distinct upward pattern to your GPA if it was only average in the beginning)?
 - Have you had to overcome any unusual obstacles or hardships (for example, economic, familial, or physical) in your life?

Personal Statement

- Writing your Personal Statement
 - If applying to several schools, you may find questions in each application that are somewhat similar
 - Do not be tempted to use the same statement for all applications
 - Answer each question being asked, and if slightly different answers are needed, you should write separate statements

Personal Statement

- Writing your Personal Statement

- Tell A Story

- One of the worst things you can do is to bore the admissions committee
 - Distinguish yourself through your story, you will make yourself memorable

- Find an *Angle*

- Figure out a way to make your story interesting
 - Find an angle or a "hook"

Personal Statement

- Concentrate on your opening paragraph
 - The lead or opening paragraph is generally the most important
 - First sentence must catch the interest the reader!
 - Grab the reader's attention or lose it
 - First paragraph becomes the framework for the rest of the Personal Statement

Personal Statement

- Top 10 “Rules”

1. Strive for depth rather than breadth; narrow focus to one or two key themes, ideas or experiences
2. Try to tell the reader something that no other applicant will be able to say
3. Provide the reader with insight into what drives you
4. Be yourself, not the 'ideal' applicant
5. Get creative and imaginative in the opening remarks, but make sure it's something that no one else could write

Personal Statement

- Top 10 “Rules”

6. Address the school's unique features that interest you
7. Focus on the affirmative in the personal statement; consider an addendum to explain deficiencies or blemishes
8. Evaluate experiences, rather than describe them
9. PROOFREAD carefully for grammar, syntax, punctuation, word usage, and style
10. Use readable fonts, typeface, and conventional spacing and margins

Personal Statement

■ Top 10 “Pitfalls”

1. Do not submit an expository resume; avoid repeating information found elsewhere on the application
2. Do not complain or whine about the "system" or circumstances in your life
3. Do not preach to your reader. You can express opinions, but do not come across as fanatical or extreme
4. Do not talk about money as a motivator
5. Do not discuss your minority status or disadvantaged background unless you have a compelling and unique story that relates to it

Personal Statement

■ Top 10 “Pitfalls”

6. Do not remind the school of its rankings or tell them how good they are
7. Do not use boring clichéd intros or conclusions
 - "Allow me to introduce myself. My name is..."
 - "This question asks me to discuss..."
 - "I would like to thank the admissions committee for considering my application."
 - "It is my sincere hope that you will grant me the opportunity to attend your fine school."
 - "In sum, there are three reasons why you should admit me..."

Personal Statement

- Top 10 “Pitfalls”

8. Do not use unconventional and gimmicky formats and packages
9. Do not submit supplemental materials unless they are requested
10. Do not get the name of the school wrong
11. Do not incorporate technical language or very uncommon words

Personal Statement Resources

- [Yale Guide](#)
- [GoGrad](#)
- [Kaplan](#)
- [Berkeley](#)
- [PrepScholar](#)

Assignment 3 – Personal Statement

Write YOUR Personal Statement

A Personal Statement is required for all applicants to the One State University graduate program. In your Personal Statement, please discuss how your personal background—including any relevant educational, familial, cultural, economic, or social experiences, challenges, or opportunities—informs your decision to pursue a graduate degree. Please describe your career goals, your research interests, and your experiences that prepared you to become an outstanding researcher. Describe how/why you think the OSU graduate program and its faculty can help you to achieve your research and career goals.

- First Draft: Include a header with your name, location, contact information. No more than 2-pages doubles spaced. Submit a *.docx file to BeachBoard.
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