Task 3:

Write your Lit Review

	More info	Page

Deliverables for this Task

A detailed outline of your Lit Review

The complete working version of your Lit Review, with the full list of references in APA format.

You will be able to revise and rework your Lit Review and list of references later, as you understand the material better.

Overview

By this time, you have probably found quite a bit of published material to work with, so you have a long lists of references to publications about your research problem. Now what will you do with this long list? What should you read first? How are you *ever* going to get through all of these articles? What is most important? What can you skip? Where will you find the time? What should you write first? How will you phrase it?

> To avoid getting overwhelmed and exhausted, specify what exactly you have to get done (your goals for the task) and then develop a plan to reach these goals. This Task Package will help.

A research paper starts with a concise summary of what the author can find, understand, and describe of what other researchers have found about the specific research problem. This becomes the first section of a research paper (the "introduction" or "Lit Review") and in many ways, it is the most important section. You main objective for Task 3 is to write your Lit Review. Consider first why it is that you need to write one.

Goals of the Lit Review. The first section of a research paper (the "introduction" or "Lit Review") has several goals. Keeping these goals in mind will help you decide how to choose, organize, and present the information in your Lit Review.

These are the most important goals of the Lit Review:

1) To make sure that the readers have a *very clear* idea of what problem you are studying. This also forces you to formulate your research problem in simpler, clearer terms for yourself.

2) To convince the readers that your problem is important to study and important enough for them to keep reading ("it's interesting" is no good!).

3) To make sure that the readers understand all the facts and background that you think are relevant (so that they can understand your way of thinking) – basically, to provide an overview of what is known about your problem.

> This background information implicitly assures the reader that what you are doing makes sense – since other people have studied your problem or related problems in similar ways. It also prepares the reader to understand very clearly the importance of what you want to accomplish with this particular study.

4) To create the impression that you, the author, are a well-informed, clear-thinking professional, so that readers will believe your results.

> A clear and direct summary of what was done in the literature, why it was done, and what is missing makes the reader think that you have enough background to do a reliable study. The Lit Review basically establishes your credentials as someone who is knowledgeable about the specific research problem; someone who is findings can be trusted.

> However, none of your readers will believe anything that you say if you don't write like a professional researcher. Grammar, punctuation, and spelling are *very* important in presenting research. You are trying to present yourself as someone who can understand complex research, so simple things like spelling shouldn't be a problem for you, right?

The next sections will help you plan your Lit Review then research and write up each of its sections. Before you submit or circulate your Lit Review, it is essential to review it very carefully to achieve a professional writing style. Your reputation as a professional depends on how well you write!

1. Plan before you begin

When you planned your literature search in the last Task, it became easier to see what you had to find and how to look for each kind of information. Similarly, by planning how you will read and write your Lit Review, you will be able to approach it step by step and produce better work with less effort.

Make a detailed outline

Your outline is a plan for reading and writing about the research literature that you have found. When you have a clear outline to start from, you can easily identify the parts of the Lit Review and you know what information to find for each part. So, you can focus on one part of the outline, read only the material that is relevant for that part and then write that part as well before moving on to another part of your outline. The outline helped guide your literature search and now it will guide what to concentrate on when you are reading and writing. The outline below is a good place to start.

Research on writing shows that expert writers start from a clear idea of the goals they have – or the questions they want to answer – for each section of what they write. These goals help them decide what is relevant and what is not, and clear goals make it easier for them to see whether or not they are making progress. You can do the same thing. The items in an outline describe the writer's goal for each section and help the writer decide what is relevant to read.

Researchers organize Lit Reviews in a wide range of different ways, often depending on the kind of problem or audience that they want to address. There are several sample Lit Reviews included in this Task Package so that you can see how other authors write them [See Sample Lit Reviews].

This outline below shows representative *parts* of a Lit Review. (Imagine that each dash ["-"] represents a sentence or paragraph. The number of sentences/paragraphs is not the real number that you should use. The section titles are just to indicate structure. You should NOT word them like this in your Lit Review.) Remember that this is just a start: your outline should go into more detail for each section.

Opening (The problem and the importance of studying this problem)
-
-
General background (The process and sub-process under study and their characteristics)
-
-
Specific background (The specific effects of the factors on the sub-process)
    The effects of Factor 1 on your sub-process
    -
    -
    -
    The effects of Factor 2 on your sub-process
    -
    -
    -
    Joint effects of Factor1 and Factor2
    -
    -
Closing paragraph
    What is still not known about your sub-process?
    -
    Which of these unknowns will you study in the current experiment?
    -

Most reports of experimental research use "issues-based" or "topical" Lit Reviews, rather than historical ones. An issues-based Lit Review focuses on **results and conclusions** from other studies, rather than on the authors or their methods – this already gives you a hint about which parts of each publication to read most carefully. Also, rather than organizing the information in chronological or historical order, for an issues-based Lit Review, the author groups the information with separate sections or paragraphs about each **factor** (or group of factors) that affect your sub-process.

Now take the outline above and adapt it to your research problem. For each paragraph, state what the main idea of that paragraph will be. Here is an example from a student project on *The Effects of Sex and Stereotype Threat on Mathematical Problem Solving Ability*. In this case, several of the topics were written up in only one or two sentences and each section ended up being one to three paragraphs long.

Opening
- Women are underrepresented in the workplace
  o they have fewer opportunities
  o their talents are not used
General Background [Process: Problem solving, sub-process: Math problem solving]
- Overview of important factors
- Problem Type
- Situational influences
- Kinds of reasoning
Effects of gender on mathematical problem solving [Factor 1: Gender]
- Sex differences change with age.
- Negative attitudes and socialization may contribute.
- Genetic factors may play a role.
- Sex differences change with test difficulty.
Effects of stereotype threat on mathematical problem solving [Factor 2: stereotype threat]
- Effects of stereotype threat generally
- Effects of stereotype threat on math
- Triggers of stereotype threat
Effects of gender and stereotype threat on mathematical problem solving
- Effects of stereotype threat on males
- Effects of stereotype threat on females
Closing paragraph

By doing this now, you will be planning *before* you write. It is much, much harder to plan and write at the same time.

Sort and Prioritize your sources

For Task 2, you found many sources for information about your research question, hopefully 50 or more. Don't even *consider* reading all of them! You will rarely need to do a totally complete and comprehensive review of all of the research literature that has ever been written on a particular topic. That is exhausting both for you, the writer, and for the reader. Instead, you want to pick the best sources and focus on them. They way that you pick and organize your sources shows a professional reader a lot about how you think about your research problem.

Sort your sources first. Make separate piles of your paper sources (books, photocopies, notes, etc.) and make separate folders for your electronic sources (reference lists, pdf files, etc.). You need separate piles because you will read, digest, and write about them separately. You won't need a separate pile for your Closing paragraph.

- Make one pile or folder for your **Opening**. Include any sources that will help you convince the reader that your research problem is important to study. Statistics about how many people are affected by your problem or about how much money is spent trying to fix it are usually helpful.

- Make another pile for your **General Background**. Include sources that talk about how your process and sub-process work in general. For example, what parts or stages have researchers identified for your process? [Your sub-process should be one of them.] What kinds of things make your sub-process faster, slower, more accurate, more error-prone, etc.? Review articles, book chapters, and books by researchers are often good for this. Experimental articles often have good information about this in their Lit Reviews, so you may want to put a separate copy of some of your experimental articles in this pile, too.

- Make another pile for **Factor 1**, to help you write the specific background sections. Include experimental articles that investigate how your factor 1 affects your sub-process. Usually, both your factor 1 and your process or sub-process will be mentioned in the title of the article or in the abstract.

- Make another pile for **Factor 2**, too. Include experimental articles that investigate how your factor 2 affects your sub-process. Usually, both your factor 2 and your process or sub-process will be mentioned in the title of the article or in the abstract.

- Finally, make another pile for experiments that study **BOTH of your factors**. These are sometimes harder to find, so you may have to go back and search for more at this point.

If you are not sure exactly where a particular article should go, then that's a topic for discussion. See if reading the abstract can help you decide. It should be very, very clear to you that a given source has to be on one pile or the other. Be prepared to explain why you put it there. Discuss any doubts with your partner until you both agree. Bring to class any articles that you cannot classify, for discussion.

Prioritize the sources in each pile. Skip the Opening pile for now. Separate each of the other piles into two: the "definitely read" pile and the "maybe read" pile.

In Task 2, there was a section on *Choosing the Best Publications*. Review that section.

a) Get rid of any articles that you cannot read because you don't know the language or that don't talk about specific experiments. You will use theoretical articles later, but not for this project.

b) Get rid of any articles that are not really about your process. Sometimes the name of your process or sub-process shows up but the article is about something else.

Now check each source to decide whether it goes in the "definitely read" pile or the "maybe read" pile.

a) Put into the "maybe read" pile sources where the authors are *not* using the same approach or discipline as you are. If they are not experimental studies and not in Psychology, then they go into the maybe pile.

   The name of the journal and the departmental affiliations of the authors will be useful clues: if you are doing an experiment in Cognitive Psychology, journals from psychiatry or neuropsychology will usually be "maybes". Authors from different departments will usually be "maybes", too.

b) Put into the "definitely read" pile sources that have your process or sub-process and any of your factors in the title or the abstract. If you see the same author on several articles, then mark those articles "read first".

c) Put into the "maybe read" pile anything else.

Now you have five piles and each pile has a "definitely read" part and a "maybe read" part.

> If any of your piles are empty or have nothing in the "definitely read" part, then go back to the library and look for more.
>
> If you still have a hard time finding sources, then consider changing to a different research problem.

Your plan now is simple:

> Don't even think of working on the "maybe read" sources until you have finished all of the "definitely read" sources.

Develop a reading strategy

How are you going to read the mountain of books and articles that you found? One by one, in alphabetical order? From oldest to most recent? The whole article from end to end? Only the abstract? These are important questions if you want to do a great job without feeling overwhelmed. A *reading strategy* is a set of answers to these questions – a plan for getting the most out of your sources.

If you sorted and prioritized your sources, then you can see that that will be a big help. Now, how will you approach all of those "definitely read" sources that you found?

There is a general reading strategy that is common to all of the parts of the Lit Review:

> ### Read *only* what you need to read!
> You should *not* read all of your articles from end to end;
> **SKIM** the articles for relevant information.

This suggestion comes as a surprise to most students, who often think that they should read everything, from start to finish. That is probably because most of your experience with reading is related to literary works and textbooks, which are designed to be read from beginning to end. Technical and scientific writing are different: articles have a very predictable structure so that you can quickly skim to find the *part* of the article that you want and get *only the information that you need* for a particular purpose.

Of course, if you have extra time and/or extra interest, you can read everything. Your main strategy, however, will be to *locate relevant information*. You are not reading comic books or delicious literary works; you are looking for specific information, so you have to be selective or reading will become very time consuming. With this skimming strategy, reviewing even 40 or 50 articles will not be a lot of work.   This allows you to include references to more articles (a good idea!) without adding too much work.

You usually do not need to read the methods section of each article for the Lit Review. But you should skim through it looking for ideas about how to do your own study.

In some cases, you can get the information that you need by reading only the abstract [the summary at the beginning of an article], particularly when you need to decide whether a study is really worth reading or not.

Specific reading strategies.   Prioritize! Decide what is most important to read first. A Lit Review has different sections that focus on different kinds of information from different sources. So,

you will have a different reading strategy for each section, just as if you had a different search strategy for each section in Task 2. Depending on which part of the Lit Review you are working on, you should only read one or two sections of an article, then you might go back to the same article later and read other sections. For each section of the Lit Review, there is a part of this Task Package that discusses the section's goals, organization, and a good reading strategy. Most of the information that you need for the Specific Background section, for example, will come from the results and conclusion sections of each article. For the Opening of your Lit Review, you will focus on information from the introduction and discussion sections of each article, etc. The table below gives you some hints on where to find the information that you will need for your Lit Review.

Where to look in an article ➜ What to find ⬇	Beginning of the article's Lit Review	The article's Lit Review	The end of the article's Lit Review	The article's Methods section	The article's Results section	The article's Discussion section
The importance of your research problem (for the Opening)	↑ Look here					↑ Look here
How your process works in general (for the General Background section)		↑ Look here				
How your factors affect your process (for the Specific Background sections)		↑ Look here for other sources			↑ Look here for facts	↑ Look here for explanations
What's still unknown? (for the Closing)			↑ Look here			

Table 3.1. Where to find information for different parts of your Lit Review, in an experimental article. The Methods section of an article is generally not useful for writing your Lit Review.

Take notes while you read. One option is to use a separate sheet of scrap paper for notes about each section. Write down useful information and include which article and which page you found it on – so you can find it again.

Develop a writing strategy

OK, so you've read everything. Now what? How will you write it all? It seems so complex and there is so much information! Even before you start writing, think about *how* you want to write: what you want to accomplish, how you can do it.

Different kinds of papers have different goals and are written for different audiences. Consequently, they have different content and different styles, as well. There is more information about the content of the different parts of a Lit Review in the sections after this one and more information on professional writing style in the section below called Revise *everything*.

If you approach writing the Lit Review with a couple of simple rules, it will help.

a) Make a detailed outline, as discussed above. One of the big advantages of having a detailed outline is that you can write the different parts *in any order*.

> You don't have to write your Lit Review from the beginning to the end. You can write the different parts *in any order*.

Most people prefer not to write straight through from the first page to the last. The sections below are "out of order" with respect to the finished Lit Review, but many people prefer to work on them in the order presented here so that finishing one section helps to write the next.

b) Divide up the work. You are working with a partner. Decide who will write which parts of the Lit Review. At the very least, one of you will be responsible for one of the factors. Be sure to comment on each others' work to improve the final product.

c) Do one part of the Lit Review at a time.

> Focus, focus, focus!
>
> Just think about one part of the Lit Review at a time.

That way you can concentrate better, you have a better idea of what to read, what to ignore, and of what to write about. You are also less likely to panic or feel overwhelmed.

The next sections provide more details about each part of the Lit Review. For each part of the Lit Review, there is information about what *goals* you are trying to reach with that section, what *reading strategy* you can use, and how to *organize* the section. Finally, there are samples of each section from student papers and published articles so that you can see how other authors have written about their research. In some cases, you will see that they have not been clear enough or they have left out information. You can do better when you know what to look for!

d) Minimize your work at the end of the project by writing better from the beginning. Do your best to write a good draft from the beginning. Most people are tired and distracted when it comes time to revise and polish the final version of a paper. Review the suggestions in section 6 *before* you start writing and try to keep them in mind while you write.

e) Write a draft and then revise very carefully. The old saying is very true: Good writing means good re-writing. Get help from other people. See Revise *everything* below.

> **Writing tip**: If you talk only about one single topic in a paragraph and afterwards start a new paragraph to talk about a different topic, then readers get the impression that you understand each of the topics much better.

2. Draft the General background

Section Summary	General background
Length:	≈1 page for draft ≈1/2 page for final version
Section title:	<your process name>
Position:	After the Opening; before the Specific Background
Main question to answer:	What are the steps or parts of your process? How does your sub-process work?
Reading strategy:	Look in review articles, book chapters, Lit Reviews of experimental articles

The "general background" section of the Lit Review is the next (after the Opening) first full page or two, in which the author describes, citing many references, how the process and sub-process being studied work in general. This, along with the specific background section, is what most people associate with a Lit Review.

Goals. Your main goal in this section is to prepare the reader to understand your research problem. Not everyone knows a lot about your process and the specific part of it that you want to focus on, the sub-process. If your question is precise, few people (even other researchers) know much about it, so you have to educate your readers. The most direct way is to simply describe how your process works in general, and then provide more details about the sub-process.

Also, this is the time to make a good first impression. Show the reader that you are professional and knowledgeable about the existing literature. Show that you can see how experiments and hypotheses relate to each other. A few simple ways of doing this are: follow APA format very carefully, get your writing revised carefully (for most people, imperfect writing is a reliable indicator of poor thinking), and triple check your facts.

Reading Strategy. Work on the "definitely read" part of your General background pile of materials. When you are writing about how your process and sub-process work, skim article introductions (the beginning of each) for information that you can rephrase or rework. Also, look in review articles for a good overview. Use textbooks for your own background information or only to find references – you never want to cite a textbook or website as a source of research.

Theses and book chapters (not those in textbooks), where authors summarize lots of previous research, are particularly useful places to find information for the general background section.

Organization and what to talk about. There are two kinds of information that are useful for writing this section: characteristics of the process as a whole (when and whether it's fast, slow, hard, easy, accurate, inaccurate, etc.) and a description of the *parts* of the process, step by step.

Focus on talking about the facts, not the authors or the studies. Using the author-inside citation style will help.

The easiest way to organize the General Background sentence is to have an introductory sentence or two about the whole process and then separate sentences (in temporal order) about the steps or phases that make up the process. Give further details about the sub-process that you will focus on. You can describe your process by answering questions like: What is known about it? What parts, sub-processes, or phases does it have? What affects each part?

For example, if your process was reading, you would have an initial sentence about reading (citing leading researchers) saying general things (i.e., about the process as a whole). Then, you would have separate sentences for word recognition, sentence analysis, semantic interpretation, and the use of prior topic knowledge.

In each sentence, you will cite important characteristics or findings so the reader can get an idea of how each component works and how they all interact. Simple examples from student papers follow.

Sample #1

There are four processes of reading comprehension. The <mark>first process</mark> is word recognition. This is the ability of the reader to recognize and correctly comprehend words easily. This process involves taking visual features and word encoding (Chabot, Petros, & McCord, 1983). The more letter knowledge and phoneme sensitivity the reader has, the easier word recognition usually is (Muter, Hulme, Snowling, & Stevenson, 2004). If the reader is unsure of a word, he or she can decipher the meaning by looking at the words around it. The more educated the reader is the easier this process is. The <mark>second process</mark>, parsing, is being able to look at a sentence or group of words and be able to describe them grammatically. This is the ability to connect the group of words or sentences to each other. The knowledge of grammar structure is priority in this process (Clifton, et al., 2003). The <mark>third process</mark> is semantic interpretation, which is the interpretation of words or phrases into understandable speech or thoughts. This is the ability to make sense of the sentences or phrases. The <mark>last process</mark> is knowledge integration takes learned information through the other processes and storing the information learned. This process helps speed up word recognition (Maguire, Frith, & Morris, 1999). <mark>Comprehension involves</mark> combining prior knowledge with knowledge gained from the story (Maguire, Frith, & Morris, 1999). The reader can apply what he or she read and answers reading comprehension questions correctly. All these processes are required in order to have optimum reading comprehension. These skills become automatic as reading proficiency is increased (Chabot, Petros, & McCord, 1983). These processes take time for the reader to complete and <mark>if the reader's time is limited</mark>, the reader might not be able to complete these processes as well as they would if there were no time limits or if irrelevant sound is present.

<first part of the process

<second part

<third part

<fourth part

<overview

<link to factor (time limits)

Sample #2

Language production is a complex process consisting of several phases. It begins with a nonverbal message in the speaker's mind. As the speaker decides to communicate his or her idea, the next phase of language production, grammatical encoding, begins (Bock, 1996). During this phase, the speaker chooses a sentence template for the message that follows the rules of the grammar. Next is lexical choice: the speaker chooses a lexical entry for each position in the sentence template, from a cohort of possibilities (Alario, Chainay, Lehericy & Cohen, 2006). Another aspect of this phase is inserting the lexical choice appropriately into the sentence template. The fourth phase of language production is phonological encoding, which involves retrieving the sounds of the words. Once the last phase is complete, the words are sent to the output systems for articulation (Bock).

<process

<parts of process

Lexical choice is necessary for language production to occur. This is the decision to use a specific word that is chosen during grammatical encoding (Bock, 1996; Alario, Chainay, Lehericy & Cohen, 2006). Lexical choice depends on the initial message, the sentence template, and the speaker's background knowledge (Krekeler, 2006). Acquiring background knowledge provides a speaker with a greater range of vocabulary to choose from when making a lexical choice (Alario, Chainay, Lehericy & Cohen, 2006).

<more detail on sub-process

<u>Hint: Keep your General Background section focused.</u>

Identify your process and **focus on one way of looking at it**. Identifying a sub-process (or part of your process) to focus on makes a good impression by showing the reader that you are more focused and interested in more precise, sophisticated questions.

☒ **Avoid** comparing different models, theories, or approaches unless your study focuses on how to decide between them.

☒ **Avoid** historical descriptions of changes in models, theories, or approaches.

☒ Do not talk about the brain **unless** you are studying the brain.

Before "surgery"	After
In addition, comprehension requires the collaboration of structural analysis, fluency in reading, knowledge integration, comprehension strategies, and monitoring understanding (Edmonds and Vaughn, 2006). The collaboration of these sub processes is active and intentional with the goal of constructing meaning (Neufeld, 2005).	In addition, comprehension requires the coordination of word recognition, structural analysis, semantic interpretation, and knowledge integration (Edmonds and Vaughn, 2006). These sub processes are active and readers coordinate them with the goal of constructing meaning (Neufeld, 2005).
[Be careful: The items in the list are not all sub-processes. Structural analysis and knowledge integration are sub-processes of comprehension; fluency is a characteristic of reading as a whole, not a sub-process; strategies are ways of manipulating the sub-processes – strategies are not sub-processes.]	
Another alternative model has emerged as an attempt to explain the mechanisms of the short-term memory.	**<Choose only one model to present.>**
When examining MRI images taken of both males and females during the execution of working memory related tasks, there are obvious differences in the level and placement of activity in separate areas of the brain.	**<This is fine only if your experiment will _also_ look at different areas and levels of activity in the brain. Otherwise, use this kind of brain-related information sparingly.>**

<u>Hint: Do not _over_cite your sources.</u>

☒ Do not cite _the same_ study more than once in the same paragraph.

☑ Use author-inside citation style.

☑ Every time you present a fact, cite your sources.

Before "surgery"	After
Consistent with previous findings, pressure causes decrements in cognitive performance by reducing working memory available for processing (Marksman, Maddox, Worthy, 2006; Beilock & Carr 2005). Counter intuitively, the hypothesized decrement in working memory capacity improves performance (Marksman, Maddox, Worthy, 2006). Improvement is hypothesized to occur due to how reduced working memory capacity persons are less likely to consistently use a suboptimal rule-based hypothesis-testing strategy for learning the category distinction (Marksman, Maddox, Worthy, 2006). Instead, subjects allow their performance to be guided by an implicit similarity-based process. Pressure that influences performance of highly learned skills by causing people to engage explicitly process that interferes with the learned procedure (Marksman, Maddox, Worthy, 2006).	Pressure causes decrements in cognitive performance by reducing the amount of working memory that is available for processing (Marksman, Maddox, & Worthy, 2006; Beilock & Carr, 2005). Counterintuitively, when the amount of working memory decreases, performance improves. This seems to be because participants do not use rule-based hypothesis testing consistently when less working memory capacity is available. Instead, they use an implicit, highly learned process based on similarity which is less sensitive to variations in working memory capacity (Marksman, Maddox, & Worthy, 2006).

Draft the Specific background

Section Summary	Specific background
Length:	≈8 pages for draft
	≈6 pages for final version
Section titles:	Effects of <factor name> on <your sub-process name>
Position:	After the General background; before the Closing paragraph
Main question to answer:	How does each factor affect your sub-process? How do the factors interact?
Reading strategy:	Look in Results and Discussion of experimental articles
Organization:	Three parts:
	•Effects of <Factor 1> on <your sub process>
	•Effects of <Factor 2> on <your sub-process>
	•Effects of <Factor 1 and Factor 2> on <your sub-process>

The "specific background" section of the Lit Review is usually the next (after the general background) first full two or three pages, in which the author describes, giving many sources, how the factors being studied affect the sub-process that was chosen. Since you are studying two factors, this part of the Lit Review will have three parts: Effects of <Factor 1> on <your sub-process>, Effects of <Factor 2> on <your sub-process>, and Effects of <Factor 1 and Factor 2> on <your sub-process>

Goals. Your main goal in this section is to prepare the reader to understand your research problem in more detail.   In this section, you need to describe how your factors affect your sub-process specifically. How does the process change when the factor changes? What is known about this? By reviewing these facts, you show the reader that you are well informed and show that your research problem is something reasonable to study.

Reading Strategy. Work on the "definitely read" part of your Specific background pile of materials. When you are writing about the specific effects of your factor, focus on the results section and discussions from each article. Your job is to summarize and synthesize as many important results as you can.   The article abstract will often give you a quick idea of what the main results were. Initially, you'll skip all the other parts of the articles.

When you talk about controversial issues, you will need to identify *why* they are controversial: different theories or different data? You can compare the introductions of conflicting studies to see what the theoretical differences are and you can compare the methods sections to see whether the different results come from different methods. Controversies are good for a Lit Review: they show that the problem is important enough to generate conflicting research and they hold out the promise that maybe your data will help decide the issue.

Organization and what to talk about. You are studying the effects of more than one factor, so make sure that you discuss each one independently. Then include an extra section about the "interactions" – what happens when both of the factors are studied at the same time. Does one factor interfere with the other? Does it catalyze or accelerate the other? Are they independent?

Focus on talking about the facts, not the authors or the studies. Using the author-inside citation style will help.

Consider, for example, whether the factor *marijuana use* affects the sub-process of *processing numbers* in working memory. For a question like this, research articles will focus on either different amounts or ways of measuring the factor (here, marijuana use) or on different aspects of the sub-

process (here, processing numbers). You can organize your review by one or the other: sections on infrequent, more regular, or constant marijuana use, or high, medium, or low doses of marijuana, for example. Alternatively, one section on adding, subtracting, or multiplying numbers, if this is what the articles studied. The clearer you organize this information, the more professional you will look.

See the sample Specific Background section below for an excellent example with commentary (Broughton & Flores, 2007; the full sample Lit Review is at the end of this Task Package).

Prior knowledge. Prior knowledge of a subject or field has been known to improve text comprehension (Chiesi, Spilich, & Voss, 1979; Voss, & Silfies, 1996; Voss, Vesonder, & Spilich, 1980), and its effect is independent of IQ (Langer & Nicolich, 1981; Lipson, 1982). There are three types of prior knowledge an individual can possess. Domain knowledge is the understanding about an entire field. Topic knowledge encompasses one part of the domain. Finally, knowledge about the text itself allows the reader to easily pick out important information from the text (Surber & Schroeder, 2007).

<Factor 1 (prior knowledge)
<Note that a source is cited for almost every fact mentioned.

 However, familiarity does not always enhance learning (Nelson & McEvoy, 2002). When testing a new product, consumers with high prior knowledge actually learned less about the product than those with low prior knowledge. This was attributed to a lack of motivation and inattention to the product information. Individuals with higher background knowledge felt more confident in their ability to learn, which in turn worked against them. Those with low background knowledge were eager to learn and therefore encoded and recalled more effectively (Wood & Lynch, 2002).

<This part shows that the factor doesn't always have the same kind of effects.

Text signaling. Text signaling are writing devices that assist readers in identifying the most important parts of a text. Extensive research demonstrates that text signals increase retention of information (Dee-Lucas & DiVesta, 1980; Lorch & Lorch, 1985, 1995, 1996a, 1996b; Lorch, Lorch, & Inman, 1993). This may be because readers who use signals encode information differently than those who do not use signals. Types of signaling include headings, previews, and summaries. Additionally, each type of signaling tends to exhibit the same positive result (Lorch & Lorch, 1995). One way signaling improves memorization is through the structure strategy effect. Using a structure strategy allows the reader to categorize the author's ideas based on hierarchal organization so that only the most important parts are remembered (Meyer & Poon, 2001). Some hypothesize that readers switch to the structure strategy when signals are present, which allows them to remember more from the text. Those who read texts without signals merely create a mental list of facts, which is an inefficient system (Lorch & Lorch, 1995).

<Factor 2 (text signals)
<Note how the authors clarify the terminology to help the reader.
<They also explain *why* the effects were found, not only *which* effects.

One type of signal —headings— contributes to a person's understanding of and capacity to retain information. When a group of students, instructed to make a mental outline, read a passage with headings, they recalled more than the students who received no instruction and read a passage with no headings (Sanchez, Lorch, & Lorch, 2001). The frequency of heading repetition is also implicated in accurate recall. When researchers randomly assigned students to a high- and low-heading-frequency group, those students in the high-frequency group scored better on recall measures (Surber, 2001). However, not all studies agree that headings are essential for comprehension. In one study researchers devised four experimental conditions in which randomly assigned groups of students read (1) an entire news article, which consisted of the headline, summary, and text; (2) the headline and text; (3) the summary and text; or, (4) the text alone. They did not find any significant differences that suggest text structure plays a crucial role in recall abilities (León, 1997).

<Specific example of Factor 2 (headings) - they go into more detail about their factor

<This part shows that the factor does not always have the same kind of effects.

Prior knowledge and Text signaling. Research indicates that prior knowledge and organization of written text affect the accuracy of recall. When the two factors are studied at the same time, accuracy of recall for written text depends on the level of prior knowledge. The frequent use of a topic label increased the recall for that specific topic in high and low prior knowledge readers (Surber, 2001). However, text organized by headings increased the overall recall for high prior knowledge readers only (Surber & Schroeder, 2007). In addition, highly structured texts increased the recall for high prior knowledge individuals (Wylie & McGuinness, 2004).

<Factor 1 & Factor 2

<How signals affect high prior knowledge readers

For low prior knowledge readers, headings are not effective in their recall for written text (Surber & Schroeder, 2007). However, these individuals are influenced by headings that indicate importance even if the information is not important to the overall text (Surber, 2001). This finding is consistent with other studies and may indicate that low prior knowledge readers have difficulty using headings to retain and recall text information (Wilhite, 1989).

<How signals affect low prior knowledge readers

Hint: Describe a process; do not make a list.

Another common mistake that some authors make is that they just make a list of findings without saying how the findings relate to each other. A Lit Review will usually focus on a process and on the specific effects of some factors on that process. The reader needs to know *which factors or characteristics* cause the effects, which *parts* of the process change, *in which situations* these changes happen, who is affected, etc.

In the problematic example below, the authors just make a list of research findings, one study at a time. The description would have been better if they made one paragraph for the differences between male and female speech, one for different kinds of people (ex: females, males, aggressive males), and another paragraph for *what* the females are talking about.

In the better example below, the authors describe the effects of auditory distractions (the factor or independent variable) on comprehension (the process). These authors mention the different kinds of auditory distractions that researchers have seen affect the process, they talk about how distractions affect comprehension (by requiring additional processing), and they talk about the kinds of participants that researchers saw affected by this interference.

Problematic Lit Review style

Patricia Hayes Bradley (1981) research suggest that female were more accepted when speech were clear and to the point. In regards to male speech, female were not well accepted regardless if female know what they are talking about or not. Bradley (1981) suggest that even if a female is intellect in speech, female would still be look down upon due to status in society.

Danielle Popp et al (2003) suggest that speech differences were more essential in race than in gender. Both black male and female speech are direct and speech is strain with feelings and is not fit for social environment compare to that of Whites. Female speech has more emotional input and is not as straight forward as that of male speech.

Neil M. Malamuth and Lisa M. Brown (1994) study the effects of aggressive male towards female speech. Malamuth and Brown (1994) findings suggest that aggressive male view on female speech is that of not being able to differentiate between kindness and seductiveness and between assertiveness and hostility; therefore female speech are less likely to be accounted for.

Cheris Kramer (1974) explains many different researches on sex differences in speech. Kramer (1974) explain that female speech are less extravagant that males. Compare to that of male, female speech are often shorter in length and word choice are not as elaborate like those of males. Female tend to show different in pitch presentation when speaking in different type of situations.

<<Can you see that this version is *listing* the studies rather than trying to tell what happens when in the process? The reader keeps asking: How are these studies related to each other?

<Also, it is using author outside citation style.

<It is even using authors' first names, which is journalistic, not scientific, style.

Better Lit Review style

Can you see that >> this version is explaining *how* auditory distractions affect comprehension? It mentions different kinds of distractors and what happens when they affect comprehension.

> Note the effective use of author-inside citation style

Auditory distractions can affect comprehension even if the sounds are ignored or unrelated to the cognitive task at hand (Campbell, 2005). Irrelevant sounds such as auditory distractions, impact comprehension abilities in different ways. Irrelevant sounds often disrupt selective attention and impair cognitive performance (Banbury, Macken, Tremblay, & Jones, 2001). Auditory distractions that occur in one's natural environment also require processing (Schroger, Giard, & Wolff, 2000). This additional processing is in addition to the four complex processes already required for reading comprehension. Reading comprehension levels decrease when irrelevant sounds are present during serial short-term memory tasks (Jones, 1999). Auditory distractions affect different populations and different cognitive tasks (Beaman, 2005). These include reading and writing of children, adolescents, and adults; and students and employees of all ages. Elementary school children, for example, when exposed to auditory distractions showed poor comprehension on challenging tasks (Evans, Hygge, & Bullinger, 1995).

Hint: Tell your reader about *which specific effects* the researchers found; not just that they found "significant effects".   The important information is *what was going on* when the researchers found significant effects. Again, the reader needs to know *which characteristics* cause effects, which *parts* of the process change, *in which situations* these changes happen, who is affected, etc.

Before "surgery"	After
Background noise has a significant effect on cognitive performance (Furham & Strbac, 2002). […] Background noise has significant effects on reading comprehension (Furham & Strbac, 2002).	Cognitive performance in general, and reading comprehension in particular, decreases when noise is present (Furham & Strbac, 2002).
Both kinds of irrelevant sounds had a significant effect on cognitive performance.	Both kinds of irrelevant sounds led to a significant decrease in cognitive performance.

4. Draft the Opening

Section Summary	Opening
Length:	≈1 page for draft ≈1/2 page for final version
Section title:	None
Position:	After the title; before the General Background
Main question to answer:	Why is it important to study this research problem?
Reading strategy:	Look for statistics on how many people are affected or how much money is spent to solve this problem; Look in first paragraph of experimental articles for other reasons

The "opening" of the Lit Review is usually the first half page or first full page of a research paper, in which the author mentions the research problem and explains why it is important for researchers to study this problem. Note that this section is about ALL research on this problem, *not* an attempt to say why *this particular experiment* or *your* research is important. This is very important! It looks extremely unprofessional if you start to brag or glorify your own research.

Goals. The opening (which does not have a subheading) has two goals: make clear what problem you will research and convince the reader that this problem is important.

The opening is especially important if you are writing a proposal where you are asking for funding or other support, if you want the research report to be accepted for presentation or for publication, etc. You might call it the "marketing" section of the paper, where you "sell" the research. *Assuming* that a problem is *inherently or obviously interesting or important* is very often FATAL to a research project, just as it is to a product, company, or service in business.

There are at least four ways that a good research problem can be "interesting" or "important".

- A clear answer to the problem can help people solve some *practical problem*. Can we improve something or solve some pressing problem with the results of this kind of study? How many people will benefit if we have better information about this problem? Answers to questions like these provide what you can call the *practical justification* for a research problem.

- A clear answer to the problem can help people understand better *how the process works*. Will we have answers that we did not have before? Answers to questions like this provide what you can call the *theoretical justification* for a research problem.

- Researching the problem will produce *useful, new data.* Will it be easier for other people to study this problem with your results (for example, your new data)? Answers to questions like this provide what you can call the *empirical justification* for a research problem.

- Researching the problem will produce *useful, new information about the methods and techniques used.* Will we know more about a particular research method after your study? Answers to questions like this provide what you can call the *methodological justification* for a research problem.

Note that different readers will think that one kind of justification is more important than another. Experimenters, for example, value highly the empirical and methodological justification of a research study. Theorists, on the other hand, pay more attention to the theoretical justification. Engineers, politicians, business people, and other non-researchers clearly pay much more attention to the practical justification of a research study. The more clearly you can develop *all* of these aspects of your justification, the stronger your research problem will be.

To develop these kinds of justification, you **have to** cite other researchers who have studied this or related problems, either using their arguments about why it is an important problem or using their results to show that some things are known and others are not. You need to cite others to give your point of view more credibility.

Reading Strategy. Work on the "definitely read" part of your pile of materials for the Opening. You may need to look for more sources. People often look in a wide range of sources, not just research journals, for information to put in the opening. For example, statistics about how many people are affected or how much money or time is spent dealing with a problem are powerful persuaders.

For this kind of information, you should not be reading articles, but skimming reports or summaries of data.

Research articles can also be helpful for the opening, as well, particularly if they deal with the same research problem. However, *just look at the first half-page or so* to see how other authors are convincing people that the problem is worth paying attention to. Sometimes, authors elaborate on the same points at the end of the discussion section, as well, so you can also look there.

Skip the rest of an article when you are looking for information to use in your opening.

Organization and what to talk about. Dive in! The very first sentence – the "hook" -- has to have a clear mention of the process or sub-process (and often of the factor(s)) and will say something clear and simple about how the understanding the process or the effects of the factors is important and what it's important for. One strategy is to cite a list of reasons why it is important and then explain each reason separately in one of the following sentences. Another strategy is to show that not very much is known (or that there are divided opinions) about the particular sub-process or factor (therefore studying it is very important, to cover the gap in our knowledge).

Your next paragraphs will provide *evidence* (usually from published research) that what you say is reasonably true or at least believable. Offering opinions without evidence is, again, often FATAL for a research project. Evidence is basically specific information found in existing research: data, summarized results, consensus opinions, etc. but YOU have to explain why or how it is relevant for what you are saying. Relevance is *never* obvious. In sum, citing other sources is very important for this section. In addition, being clear about *why* you are citing them is also important.

Sample Openings

The sample opening paragraph below, from a student paper on mother-child interaction, illustrates some of the observations above.

Investigation into the different ways that mothers and children interact has helped researchers understand attachment patterns and assess development in infants and children. How a mother shows affection towards an infant, how her emotions and personality affect infant-mother attachment, and patterns of attachment in different cultures are all important clues in understanding the infant's later behavior and development. With this information, researchers can determine whether an avoidant or anxiously attached infant will turn into a difficult child or adolescent and understand what will help the mother and infant form a healthy relationship.

<theoretical importance
<The problem: How X affects Y
<practical importance

In the sample openings below, how good a job did the authors do? Is the problem clear? Is it clear why it is important? Discuss with your partner what you think works and do not work in the different ways that the authors below presented their research problems. Did the authors just say that their topics are important, or did they provide reasons to try to convince you?

Sample #1

Crafting persuasive written arguments is an important writing skill (Fulkerson, 1996). Organizing text as arguments is central to a number of writing genres, including academic, business, expository, and persuasive writing (Gilbert, 1997; Rottenberg, 1988; Toulmin, Rieke, & Janik, 1979). Furthermore, Wiley and Voss (1999) suggested that producing written arguments helps individuals synthesize and deepen the comprehension of texts. One key component of argumentative writing is the consideration of counterarguments to one's position. By definition, a counterargument presents reasons why one's position might not be true or advisable. Consideration of counterarguments is important for two reasons. First, a meta-analysis by O'Keefe (1999) found that texts that considered and rebutted counterarguments were more persuasive than texts that did not (unless the text was selling a product). Because counterarguments may occur to the reader, O'Keefe concluded that raising and rebutting counterarguments on balance enhance persuasiveness. Second, many normative models of good thinking involve the ability to consider and evaluate alternative viewpoints (Baron, 1988; Ennis, 1987, 1995; Scriven, 1976). For both these reasons, researchers regard the consideration of counterarguments as an important aspect of good writing (see Santos & Santos, 1999, for a review).

<the process is important

<the sub-process is important

Nussbaum, E. M. & Kardash. C. (2005). The Effects of Goal Instructions and Text on the Generation of Counterarguments During Writing. *Journal of Educational Psychology, 97*, 157–169.

Sample #2

A fundamental question for professionals involved in the selection, training, evaluation and hiring of simultaneous interpreters is that of what interpreters know that bilinguals do not. Do simultaneous interpreters know different strategies for allocating attentional and memory resources? For making sentence processing more efficient? For bringing prior knowledge to bear on comprehension? Answers to these questions are important in that they can provide the principles on which to base assessment of proficiency and aptitude, planning of training, and on-going improvement of professional performance.

<the process is important in practice

Although simultaneous interpreting has received increasing attention as an object of study (Mackintosh, 1985; Henry & Henry, 1987; Gile, 1988), unfortunately little of it has been in the form of reliable experimental research (Gile, 1988). Consequently, precious little is known about the differences between experienced and novice interpreters' performance, and nothing at all is known about any possible differences in the way they go about carrying out the task (Dillinger, 1989). Two sets of opinions, however, have emerged on this issue.

<the process is important for theory, too

Dillinger, M. (1994). Comprehension during Interpreting: What do Interpreters know that Bilinguals don't? In: S. Lambert & B. Moser-Mercer (Eds.), *Bridging the gap: Empirical research in simultaneous interpretation* (pp. 155-189). Amsterdam: J. Benjamins.

5. Draft the Closing paragraph

Section Summary	Closing paragraph
Length:	≈1/2 page for draft ≈1/2 page for final version
Section title:	None
Position:	After the end of the Specific Background; before the Methods
Main question to answer:	What is unknown and which specific unknown will you study in this experiment?
Reading strategy:	Look in end of Lit Review or Discussion of experimental articles to find unanswered questions

The closing paragraph (not "conclusion"; with *no* heading) of the Lit Review usually summarizes the main findings, identifies some of the things that are still unknown or problematic, and makes some mention (again) of why it is important to study them. The closing paragraph will end by pointing out which one of these unknowns or problems the researcher will study in the experiment(s) that the rest of the paper describes.

Goals. The main goal of the closing paragraph is to make your specific problem clear to the readers, now that they have all the background information that you provided.

State what is problematic, controversial, or not known yet. Make a (short) list of outstanding problems. Which item on the list will your experiment deal with?

This is also an opportunity to restate the focus of your experiment, in more precise technical terms, now that the readers have the necessary background to understand the more precise formulation.

Reading Strategy. When you're writing about the unknown or open issues that require further research, you can look for them in the Discussion section or the end of the Lit Review in each article.

Organization and what to talk about. The Closing paragraph is basically a short summary of the Lit Review that emphasizes the problems that still need to be solved or investigated. It also has to point out the specific problem that the current study will investigate, with a reminder of why it is important as the last sentence.

Sample Closing paragraphs

Below are two example closing paragraphs where you can see very clearly the outstanding issue, a quick summary of the specific background section, some mention of importance, and a quick sketch of the present study.

Sample #1

There has not been much research in the specific area of reading comprehension and time limitations. Individuals may need more time to complete tests, but time limitations may greatly lower their scores. Background noise and time constraints affect reading comprehension by distracting the individual from actively decoding a reading passage's message. The present study will involve testing participants on their ability to read an assigned passage and answer questions while television and time constraints are present. Contrasting this research to participants tested with no noise and no time constraints affects reading comprehension due to environmental differences. This research will provide individuals as well as educational institutions the ability to understand the environmental conditions necessary for reading comprehension. This study observes time limitations and television exposure on reading comprehension among native English speaking adults.

<Outstanding issue

<Summary

<The present study

<Importance

Sample #2

Past research has suggested that prior knowledge and text signaling affect recall. However, much of the interactional studies between the two factors focus on recall of summaries or texts within a school textbook. Additionally, there exists some discrepancy surrounding prior knowledge and whether it significantly facilitates learning. The present study will assess participants on their ability to accurately recall facts from a brief article based on their prior knowledge and presence of text signals. This research will provide government officials, educators, and others with a better understanding of how to write more effectively in order to cater to different populations based on background knowledge and interests.

<Summary

<Outstanding issue

<The present study

<Importance

In the sample closing paragraphs below, how good a job did the authors do? Is it clear *exactly* what they will be studying and why it is important? Discuss with your partner what you think works and do not work in the different ways that the authors below presented their research problems.

Sample #3

Furthermore, there is a research group that investigates the usability of Web pages (Morkes and Nielsen, 1997). It is categorized into a field of computer engineering and is named as a research field of human computer interactions. The two research streams that investigate cognitive processes of readers scarcely have connections with research achievements of the human computer interactions. Even the two research streams to investigate the cognitive processes of readers seem to have little exchange with each other. For example, reading models advocated for print text have not been integrated into those related to reading hypertext. In other words, the three research streams that are related to the topic of this paper seem to have remained independent of one another. Given this background, this paper tries to investigate the kinds of strategies ESL learners use when they read through the authentic pages on the Internet, incorporating all the knowledge about reading processes for print text both in L1 and L2, about hypertext and about Web navigation.

Konishi, M. (2003). Strategies for reading hypertext by Japanese ESL learners. *The Reading Matrix, 3*, 3-18.

Sample #4

The top-down approach to designing interfaces for assembly, then, provides two cognitive design principles: First, structure the interface to match the structure of the procedure to be taught. This means the interface should explicitly represent the hierarchical structure of the task to be performed. Second, use text and pictures, with a question mark on animated versus static pictures.

We applied these principles to the design of interfaces for two different assembly tasks, assembly of a saxophone and assembly of a toy bug from a construction kit. For the saxophone, we had determined the hierarchical structure from previous research (Zacks et al., 2001), but we double checked and refined the hierarchy for this experiment. For the toy assembly, we built in the hierarchical structure into instructions. The tasks differ in several ways. Although order of assembly is constrained in both, that is, certain operations must be accomplished before others; there are fewer constraints in the toy assembly.

Zacks, J. & Tversky, B. (2003). Structuring Information Interfaces for Procedural Learning. *Journal of Experimental Psychology: Applied, 9*, 88–100.

3. Revise everything: Develop a professional writing style

This section focuses on using words and grammar to look your best. There are several suggestions for developing a professional style, and they are summarized by a Hit List – a list of the errors you really need to get rid of to look professional.

Professional style has several components. Professional writers focus on how the reader will react to their writing: how easily readers will understand, what impression readers are likely to have of the writer, etc. Several points on how to make your writing more professional follow, with examples from real student writing.

> Your best strategy is to budget time to get repeated feedback on your writing and APA formatting from several people.

Main differences: Lit Reviews vs. General Audience essays

The table below will help you understand some of the main differences between a technical Lit Review for an audience of researchers and a general audience article in *Discover* or *Psychology Today* which is written for a non-technical audience. The kinds of essays that you probably studied in writing classes are more similar to these general audience articles than to science writing.

Content	Lit Review	General Audience essay	Notes
First paragraph ("introduction")	Make the research question clear; say why it's important for understanding (theory), for having enough data, for improving research methods and/or for solving practical problems	Lead with an unusual example or unanswered question; make the research question clear; say why it's important for understanding in general or for solving practical problems	Establish interest; give the reader (implicitly) reasons to continue reading
Middle paragraphs ("body")	Include separate sections (one or two paragraphs) on the research done about different factors, methods, and so on. Emphasize citations of empirical studies.	Include separate sections (one or two paragraphs) about different populations, different researcher groups, different times, and so on. Emphasize specific examples of people, situations, problems, and so on.	This is the part with the most facts and citations (in Lit reviews) or examples (in GA papers)
	Be specific and detailed when citing results of different studies. Avoid talking about methodological details.	Be general and avoid details when citing results of research studies. Do not talk about methodological details.	For GA papers, do not overwhelm non-technical readers with technical details.
Closing paragraph	Talk about what still is not understood or has not been studied yet. Identify clearly what your experiment will study from among the things you listed in the next-to-last paragraph.	(more of the same; this is not different from the body of the paper) Make clear what you want the reader to take away. Talk about the positive effects of more research like this; talk about questions for future research, and so on.	This part is to convince the reader that this kind of research is important and valuable.

Stylistic differences	Lit Review	General Audience essay
Pronouns	**Do not** use second-person pronouns ("you", etc.)	You **can** use the second-person to address the reader directly.
Emotion	Be conservative and unemotional in presenting results. Sound serious and professional.	You can be dramatic and enthusiastic in presenting phenomena. Sound very interested.
Names	Use APA citations (i.e., last names only). **Never** cite full names of patients or participants. Patients are cited by initials only (e.g., "H. M.") or by first name plus last initial (e.g., "Polly S.")	Feel free to cite full names of researchers but **never** cite full names of patients or participants. Patients are cited by initials only (e.g., "H. M.") or by first name plus last initial (e.g., "Polly S.")
Definitions	Don't use dictionary definitions	Dictionary definitions are an option
Rhetorical questions	Do not use rhetorical questions (the ones that you ask yourself and then answer yourself).	Rhetorical questions are an option
Metaphors	Avoid metaphors and figurative language.	Metaphors and figurative language are an option. Extended metaphors that the author explains piece by piece are common.
Sources	Do not cite non-research sources. Use APA-format citations and reference list.	Non-research sources are an option. Do not use citations or a reference list.
Technical terms	Use precise technical terms.	Avoid technical terms.
Readability (This is last on the list but should be your very first priority!)	Write for university-level readers (12th grade) – technical and/or less common words and direct sentences.	Write for a general audience (10th grade at most!) -- short, common words and short, simple sentences.

Write objectively.

☒ Avoid *I, me, my, mine, we, us, our, ours, you, your, yours*. Do not talk about yourself unless someone asks you to. Do not talk to your reader unless you are speaking. Opinions on this vary, but you will look much more professional and objective if you follow this rule.

☒ Do not make value judgments by saying what is better or worse, superior or inferior, evident or obvious. Avoid telling people what to do with *should, must, need to,* and *have to.* Be objective by saying what is higher or lower, bigger or smaller, faster or slower.

☒ Do not talk about why *your* study is important. Talk about why *the research question* is important.

☑ Every time you present a fact, cite your sources.

Before "surgery"	After
More exposure to auditory stimulation causes more familiarity and more comprehension.	Participants adapt to reading with music and the interference of music decreases (Hilliard & Tolin, 1979).
Our present study will focus not only on…	This study focuses on…
The importance of this study is to see how environmental factors influence our working memory.	It is important to understand how environmental factors affect working memory.

Author Awareness

Writers are often warned to be careful to write with their readers' knowledge and needs in mind, something called "audience awareness". At the same time, it is important to remember that the way you write leads your readers to draw conclusions about what kind of person you, the author, are. When you are aware of this, with practice you can easily manipulate the reader to draw this or that conclusion about you. We can call this writing with "author awareness".

For each of the texts below, what can you guess about the **author**?

	Age	Gender	IQ	Job	Other
1. My friend Melanie just got a new car. She has to pick it out herself. It is so cool. A little Beetle. It even has a sunroof and a flower holder. She put a sticker from our school on the window and a plastic daisy on the dashboard. I just love the seat covers she found: tiger stripes! She must have looked all over for them. I've never seen anything so totally cool. We love to ride around in it with the music real loud. She's soooo lucky.					
2. My colleague Melanie was just given a new automobile. Her parents allowed her to choose the model and characteristics without any supervision. Her model has a superfluous window in the roof and several other frills. In the space of a few days, she defaced the vehicle with stickers, horrendous seat covers and other ridiculous accessories. I've never seen anything quite so absurd. She rides around in it as if it were a discotheque on wheels. She's so very tacky.					
3. That bitch Melanie just got new wheels. A stupid little bug with totally gross seat covers. Now she just drives around all the time like she's hot shit.					
4. Miss Andrews' parents have just provided her with a new vehicle. Irresponsibly, they allowed her to choose the model, the color, and the accessories by herself. They permitted her to waste money on such things as an additional roof window and gaudy, tasteless seat covers. Rather than provide her with adequate instruction in the use of the vehicle, they allow her to parade it throughout the neighborhood and make a nuisance of herself playing excessively loud music of questionable taste. She's behaving as if she were the housemaid's daughter.					

Now go back and see which words and what kinds of sentences each author used. Almost every word that you use tells your reader or hearer about who you are and what you are like.

Which author do you want to sound like when you apply for a job?

> When you write a Lit Review, you want to sound like a competent, well-informed professional; otherwise, no one will believe your results.

Make your Lit Review easy to read.

You do not get extra "points" for making your Lit Review hard to read. Quite the contrary! If your readers have to make a special effort to find the ideas in the middle of your words, then they will conclude that you do not have a clear idea of what you are talking about. Rather than look like a competent, well-informed professional, you look like a confused kid (no matter how competent or experienced you are).

Your English teacher might have encouraged you to make long sentences with sophisticated words, but *please* do not try to write literature for a research report. Scientific writing is hard enough to read *without* long sentences and archaic expressions.

Here are some examples, before and after "reconstructive surgery".

Before "surgery"	After
The amount of research performed on the subject of the interaction of memory and gender has been extensive.	The research on memory and gender is extensive.
Males generally exhibit an elevated confidence level of performance on tasks and it can be surmised that this confidence allows them to proceed with a higher rate of speed than females…	Males have more confidence and this allows them to perform these tasks faster than females do.
With the simultaneous processes needed for reading, it has been proposed that foreign language speakers may have a more difficult time comprehending written material.	Reading is more difficult for foreign language speakers.
Also found in studies that used music as background noise was that participants that were exposed to music during reading, especially music of lower tempo, took longer to read text as well as had poorer efficacy in their comprehension of it.	Participants who listened to background music took longer to read and understood less.
Another aspect of rate of speech that was determined was that silent reading differs greatly from verbal reading.	Rate of presentation affects auditory comprehension more than reading.
It links and integrates visuo-spatial information as well as verbal information and also the chronology of stories or move scenes.	The episodic buffer integrates spatial and verbal information over time.
In spite of this increasing appreciation, researchers still understand little about how emotion and different modalities affect memory processes.	There are many open questions about how modality and emotion affect memory.

To write more directly and clearly, follow these simple rules:

☒ Do not write at a reading level that is higher than 12th grade. Use MS Word's grammar and style checking tool to check your texts for reading level.

☒ Do not use any words, expressions, or sentence types that you are not *absolutely sure* are both correct *and* appropriate. When in doubt, write the same thing in a different way.

☑ Do start your sentences with the "doer" of the action that the sentence describes.

☑ If you know a simpler way of writing something, use it.

Find your "voice".

A common mistake that writers (even professional researchers) make is to "distance" themselves from the facts or opinions that they are describing. They put words in other people's mouths rather than stating things themselves. They also talk about *the studies* rather than focus on the phenomena. If you do this once or twice, it is not a problem. But if your whole Lit Review is "Kintsch (1998) concluded…", "The researchers found…", etc. then what are *you* saying? The reader starts thinking that you, the author, have nothing to say about the topic and then starts to imagine that it is because you do not know what you are talking about.

Citation styles. You can make your voice clearer by paying closer attention to the way that you cite other researchers' work. There are two basic types of citation. They do not have official names, so you can use these informal names:

"author-inside" style (the authors' names are *in*side the parentheses) and
> – *Marijuana use has significant effects on short-term memory (Smith, 1999; Terrence, 2000, 2001; Welsley, 2003).*

"author-outside" style (the authors' names are *out*side the parentheses).
> – *Anderson (2002, p. 95) found that…*

The "author-**in**side" style is almost always better because it forces you to focus on the ideas rather than on the people. And it makes you say things in *your* voice.

Before "surgery"	After
According to Oliver (1997), using background music in a learning environment is associated with improved academic performance.	Background music improved academic performance (Oliver, 1997).
One study found that the learners who studied audio/visual material tended to…	Learners who studied audio/visual materials tended to…
It is possible to directly relate rate of speech to comprehension by reviewing several of the studies that have been conducted over the past few decades.	Faster rates of speech interfere with comprehension.
It is also important to consider that even though music as well as other auditory distractions are ignored or unrelated to the cognitive task, it can still affect reading comprehension.	Although readers ignore auditory distractions, the distractions still affect reading comprehension.
Contrary to these hypotheses, studies that are more recent have demonstrated an opposite aspect.	**<No rewrite: the sentence did not provide any new information.>**

Watch out for the details!

☑ ALWAYS have someone else (preferably someone with more experience in this type of writing) review your writing before circulating it. Go to the Writing Center *every time* you have to hand something in.

☑ Use *affect* as a verb and *effect* as a noun. There are, of course, other uses for these words, but you can make your life simpler by sticking to these two for now.

☑ Put citations **in**side the end-of-sentence punctuation. Notice the period in this example:

Before "surgery"	After
Pressure causes decrements in cognitive performance by reducing the amount of working memory that is available for processing. (Marksman, Maddox, & Worthy, 2006; Beilock & Carr, 2005)	Pressure causes decrements in cognitive performance by reducing the amount of working memory that is available for processing (Marksman, Maddox, & Worthy, 2006; Beilock & Carr, 2005).

☒ Don't use *might* or *could*, so that you do not sound unsure or wishy-washy.

☒ Avoid informal, spoken language like *plenty of, lots of, amazing, huge.*

☒ Don't ever say that research has *proven* or may *prove* something. This word is only appropriate when talking about mathematics and logic.

☒ Avoid asking questions and formulating explicit definitions (or taking them from a dictionary).

☒ Avoid quoting other researchers' exact words, unless you want to argue about which words they chose.

☒ Avoid sentences with passive verbs.

Before "surgery"	After
The effect on memory by gender has been both widely studied and debated in an effort to…	Researchers have studied the effects of gender on working memory to…

Research Writing Hit List

Members of the Mafia have lists of people that they want to get rid of, right? Well, here is a list of the 10 worst errors that occur frequently in student writing. You need to get rid of them. You should wrap these errors in cement overcoats and throw them overboard in the middle of the ocean, so no one ever sees them again. They really make you look very, very bad in school and they make you look *even worse* at work, so adopt a very strict, zero-tolerance policy.

> **Don't ever let any of your writing go out with even one of these errors!**

1. **Don't try to write literature when you are writing for research or business. Write for clarity: that is, at or below a 12th grade reading level.**

   Ex. The ability to convey information in a clear and effective way through writing is to the advantage of the individual in any and all aspects of their short term and long term professional goals. [16th grade level]

   > *~ Writing is important at work. [5th grade level] (!)*

   Other examples with errors
   - Many people become ridden with stress and anxiety just with the mere thought of having to write. These emotions only further hinder a person from attempting to write.
   - To their own detriment, they cease to acquire further learning skill in writing.
   - Writing is a portrayal of your abilities as a scholar and expert in your field.
   - Poorly written samples will be harmful to employment consideration.
   - Writing has been a skill that has often been honed inside a school setting.
   - Promotions, after being considered, come true.
   - …writing well needs to be a task taken more seriously…
   - …better writing skills than were expected in the previous position.
   - … these types of communication are being look at as one of the main methods of communication.

2. **Don't repeat the same word or word root in the same sentence.**

   Ex. Not only will good writing skills make the person more skillful but it will provide the person with countless opportunities for personal growth.

   > *~Good writing skills will help you grow personally and professionally.*

   ☞*…if your sample writing is poorly written…*

   > *~…if you provide a poor writing sample…*

   ☞*The experimenters did two experiments.*

   > *~ The experimenters did two studies.*

   Other examples with errors
   - Having good writing skills should be an important skill everyone should seriously take into consideration.
   - The National Commission of Writing says that about 70% of corporations say that two-thirds of their paid employees have some responsibility for writing.

3. Don't repeat the same subject in two different sentences.

Ex. The experimenters chose the participants. <mark>The experimenters</mark> *gave them a test.*

~ The experimenters chose the participants. Then the participants took a test.

☞*Smith and Jones (2005) investigated the effects of marijuana on memory.* <mark>Smith and Jones (2005)</mark> *found strong effects on memory for numbers.*

~ Smith and Jones (2005) investigated the effects of marijuana on memory. They found strong negative effects on memory for numbers.

4. Don't use Old English words, fancy words, invented words, or informal words. Impress readers with words that they know, not with your crazy vocabulary.

Ex. The <mark>cool</mark> *experimenters* <mark>sought</mark> *to* <mark>partake</mark> *of* <mark>great</mark> *experiments* <mark>amongst</mark> *participants who* <mark>obtained wondrous</mark> *scores* <mark>whilst</mark> *reading* <mark>huge</mark> *texts.*

~The experimenters studied how the participants read long texts.

☞*…you look* <mark>unknowledgeable</mark>*…*

~…you don't look knowledgeable…

☞*When* <mark>one</mark> *is clear, then…*

~ When your writing is clear, then…

☞*…writing will still be one major* <mark>proponent</mark> *that can make you or break you.*

To their own <mark>detriment</mark>*, they* <mark>cease</mark> *to* <mark>acquire further</mark> *learning skill in writing.*

~ They stopped improving their writing.

Other examples with errors

- …you can enjoy this <mark>tummy</mark> delight anytime you want.
- …if you are a <mark>great</mark> candidate…
- <mark>Writhing</mark> is a skill and it can help you or hurt you in life.
- …writing will still be one major <mark>proponent</mark> that can make you or break you.

5. Don't mix plural pronouns with singular nouns or vice versa.

Ex. The students handed in <mark>his</mark> *test.*

~The students handed in their tests.

☞*The child found* <mark>their</mark> *toy.*

~ The child found his toy.

Other examples with errors

- A student who lacks excellent writing skills will have trouble reaching <mark>their</mark> educational goals.
- After a person earns <mark>their</mark> degree, writing will continue to be of importance in the work world.
- These companies do not only look at the talent and schooling required but how good <mark>their</mark> writing skills are as well.
- Professors use writing as a technique to distinguish whether the student can convey information in a clear and effective way so that when <mark>they</mark> graduate <mark>they</mark> can use good writing as a tool in the professional world. (38 words!)
- Writing better can even help <mark>us</mark> accomplish… utilized in such a way to help <mark>you</mark> become ….
- If <mark>one's</mark> thoughts do not clearly express what <mark>you</mark> are trying to convey or written in a professional manner,…
- …directions to a place from someone? Maybe if <mark>they</mark> had written them down themselves …

6. Don't mix plural subjects with singular verbs or vice versa.

Ex. Writing skills ==is== not only important in schools…

> *~ Writing skills are not only important in schools…*
>
> ☞*Excellent writing skills ==benefits== the one who possesses ==it==.*
>
> *~Excellent writing skills benefit everyone who has them.*
>
> ☞*When others ==reads== and ==gives== suggestions to ones work, …*
>
> *~When others read and give suggestions about your work, …*

Other examples with errors

- Some may think that writing skills only ==goes== as far as inside university doors.
- Excellent writing skills ==benefits== the one who possesses ==it==.
- The benefits of writing well ==gives== a person access…
- When others ==reads== and ==gives== suggestions to ones work, …

Be careful: Things can get confusing, so you have to pay close attention.

*Writing books **is** difficult.* = Writing books about some topic; **Writing** is difficult.

*Writing books **are** difficult [to read].* = Books about writing; **The books** are difficult.

7. Don't mix possessives (*-'s or -s'*) with plurals (*-s*).

Ex. The ==experimenter's== gave the ==students== pictures to the ==teacher's==.

> *~The experimenters gave the students' pictures to the teachers.*

Be careful: Possessives and plurals sound exactly the same, but they mean very different things.

the student==s== pictures means more than one student (plural), more than one picture, and no relation between the students and the pictures. This doesn't make any sense.

the student=='s== pictures means one student, more than one picture, and the pictures belong to or are of the student (possessive).

the student==s'== pictures means more than one student, more than one picture, and the pictures belong to or are of the students (possessive *and* plural).

8. Don't use sentences with passive verbs.

Ex. This horrible sentence ==was written== with a passive verb.

> *~==Someone== ==wrote== this horrible sentence with a passive verb.*
>
> ☞*The participants ==were given== a memory test.*
>
> *~ The participants ==took== a memory test.*

Be careful: Make sure that the "doer" of the action is the subject of the sentence.

9. Don't mix up *who* and *that*.

Ex. The children ==that== arrived loved the dogs ==who== were sleeping.

> *~The children who arrived loved the dogs that were sleeping.*

Be careful: *who* is for humans; *that* is for animals and things.

10. Don't use definite articles (*the*) and pronouns that no one understands.

Ex. <mark>*This*</mark> *was the most important part.*

        ~The last step was the most important one.

☞<mark>*They*</mark> *made an important conclusion.*

        ~The experimenters reached an important conclusion.

☞*Sixty participants took* <mark>*the*</mark> *test.*

        ~Sixty participants took a test to measure their IQ.

Be careful: Definite articles (*the*) are just like pronouns. When you use a *the*, you assume that your reader knows exactly *which* thing you're thinking of. But, your reader doesn't have telepathic powers. Try to give your reader enough information.

Ex. All participants put their answers on the sheet. [Which sheet is the writer thinking of?]

        ~All participants put their answers on a response sheet that the experimenter distributed.

Sample Student Lit Review

Broughton, K. & Flores, N. (2007). *The effects of prior knowledge and text signals on recall.* Unpublished manuscript. Department of Psychology, San Jose State University.

The idea that text structure and prior knowledge affect recall memory holds useful implications for everyday life (Surber & Schroeder, 2007; Wylie & McGuinness, 2004). Effective written communication is essential across all social domains, especially in school and the workplace. Creating a well-written document depends on more than the context of the information (Morris, C., Stein, & Bransford, 1979). The mere physical format facilitates learning and retention. This benefits both the writer and the reader because the writer can convey the purpose more accurately and the reader can remember the information with less effort. Manipulation of text structure context based on familiarity will enhance learning across many social situations.

< Opening

Long-term memory. Memory is a cognitive system that allows us to store, retain, and retrieve information. In the broadest terms it is broken down into short-term, long-term and sensory memory. Long-term memory includes declarative and procedural memory. Theorists generally accept that memory is part of the executive functions of the brain (Hogan, Kelly, & Craik, 2005). This system has three main phases that contribute to creating and maintaining a specific memory. The first phase is encoding, which refers to the initial processing of information (Buckner & Koutstall, 1998). Once the information is encoded, a representation of the object or action is formed within the brain (Walker & Stickgold, 2006). The next phase of memory is known as the consolidation and storage phase. The information encoded is now converted into a more enduring form for later retrieval (1998). Consolidation itself is broken down into two stages: a stabilizing stage, which occurs during the wake cycle, and an enhancement stage that occurs during the sleep cycle (2006). Although the stages occur during different cycles, both work to promote the restoration and maintenance of a memory (2006). The final phase of the memory process is retrieval, which refers to accessing prior information that has been encoded and consolidated (1998). Retrieval occurs through recall and recognition, in which a cue is usually presented to an individual. This cue helps to facilitate and gain access to the stored information (Craik, 1979). Once a memory is no longer needed, it is reconsolidated and stored for future retrieval.

< General background

<sub-processes

[Note the systematic use of author-inside citation style.]

The phases of memory are multifaceted and unfold over time in a relatively automatic process. Recall ability is one measurement of memory and can be enhanced or hindered by a number of variables. Factors such as prior knowledge, verbal ability, and organizational signals within a text affect recall in a variety of ways (Kardash & Noel, 2000).

Prior knowledge. Prior knowledge of a subject or field has been known to increase recall (Chiesi, Spilich, & Voss, 1979; Voss, & Silfies, 1996; Voss, Vesonder, & Spilich, 1980), and is independent of IQ (Langer & Nicolich, 1981; Lipson, 1982). There are three types of prior knowledge an individual can possess. Domain knowledge is the understanding about an entire field. Topic knowledge encompasses one part of the domain. Finally, knowledge about the text itself allows the reader to seamlessly pick out important information from the text (Surber & Schroeder, 2007).

< Factor 1 (prior knowledge)

The order in which the information is presented is also relevant to recall. Students with high prior knowledge remembered more of the unfamiliar items in a passage when they were presented prior to the familiar items. Conversely, the presentation order did not affect recall in low background participants. It was suspected that prior knowledge had an inhibitory effect when presented prior to the unfamiliar ideas (Lipson, 1982).

However, familiarity does not always enhance learning (Nelson & McEvoy, 2002). When testing a new product, consumers with high prior knowledge actually learned less about the product than those with low prior knowledge. This was attributed to a lack of motivation and inattention to the product information. Individuals with higher background knowledge felt more confident in their ability to learn, which in turn worked against them. Those with low background knowledge were eager to learn and therefore encoded and recalled more effectively (Wood & Lynch, 2002).

Text signaling. Text signaling refers to the writing devices that assist readers in identifying the most important parts of the reading. Extensive research demonstrates that text signals increase retention of information (Dee-Lucas & DiVesta, 1980; Lorch & Lorch, 1985, 1995, 1996a, 1996b; Lorch, Lorch, & Inman, 1993). This may be because readers who use signals encode information differently than those who do not use signals. Types of signaling include headings, previews, and summaries. Additionally, each type of signaling tends to exhibit the same positive result (Lorch & Lorch, 1995). One way signaling improves memorization is through the structure strategy effect. Using a structure strategy allows the reader to categorize the author's ideas based on hierarchal organization so that only the most important parts are remembered (Meyer & Poon 2001). Some hypothesize that readers switch to the structure strategy when signals are present, which allows them to remember more from the text. Those who read texts without signals merely create a mental list of facts, which is an inefficient system (Lorch & Lorch 1995).

One type of signal —headings— contributes to a person's understanding of and capacity to retain information. When a group of students, instructed to make a mental outline, read a passage with headings, they recalled more than the students who received no instruction and read a passage with no headings (Sanchez, Lorch, & Lorch, 2001). The frequency of heading repetition is also implicated in accurate recall. When researchers randomly assigned students to a high and low heading frequency group, those students in the high frequency group scored better on recall measures (Surber, 2001). However, not all studies agree that headings are essential for comprehension. In one study researchers devised four experimental conditions in which randomly assigned groups of students read (1) an entire news article, which consisted of the headline, summary, and text; (2) the headline and text; (3) the summary and text; or, (4) the text alone. They did not find any significant differences that suggest text structure plays a crucial role in recall abilities (León, 1997).

Prior knowledge and text signaling. Research indicates that prior knowledge and organization of written text affect the accuracy of recall. When the two factors are studied at the same time, accuracy of recall for written text depends on the level of prior knowledge. The frequent use of a topic label increased the recall for that specific topic in high and low prior knowledge readers (Surber, 2001). However, text organized by headings increased the overall recall for high prior knowledge readers only (Surber & Schroeder, 2007). In addition, highly structured texts increased the recall for high prior knowledge individuals (Wylie & McGuinness, 2004).

For low prior knowledge readers, headings are not effective in their recall for written text (Surber & Schroeder, 2007). However, these individuals are influenced by headings that indicate importance even if the information is not important to the overall text (Surber, 2001). This finding is consistent with other studies and may indicate that low prior knowledge readers have difficulty using headings to retain and recall text information (Wilhite, 1989).

Past research has suggested that prior knowledge and text signaling affect recall. However, much of the interactional studies between the two factors focus on recall of summaries or texts within a school textbook. Additionally, there exists some discrepancy surrounding prior knowledge and whether it significantly facilitates learning. The present study will assess participants on their ability to accurately recall facts from a brief article based on their prior knowledge and presence of text signals. This research will provide government officials, educators, and others with a better understanding of how to write more effectively in order to cater to different populations based on background knowledge and interests.

Sample Published Lit Review #1

Lorch, R. & Lorch, E. 1996. Effects of Organizational Signals on Free Recall of Expository Text. *Journal of Educational Psychology, 88*: 38–48.

Organizational signals include a variety of writing devices designed to emphasize the structure of an expository text (Lorch, 1989). They include headings, topical overviews, topical summaries, and other devices. It has often been hypothesized that organizational signals should facilitate text recall by aiding readers in representing the organization of a text, which, in turn, should facilitate a systematic search of the text representation at retrieval (e.g., Lorch & Lorch, 1985; Meyer, 1975). In fact, organizational signals have often been found not to affect overall recall (Brooks, Dansereau, Spurlin, & Holley, 1983; Lorch, Lorch, & Inman, 1993; Meyer, 1975; Meyer & Rice, 1982) except for specific groups of readers (Meyer, Brandt, & Bluth, 1980; Meyer & Rice, 1989) or under limited text conditions (Lorch & Lorch, 1985; Meyer & Rice, 1989). Recently, it has been reported that the presence of organizational signals in a text does aid readers in representing the text's topic structure but that the effect on free recall is to influence the distribution of recall of text content rather than the amount of material recalled (Lorch et al., 1993). The purposes of the current study are (a) to establish more firmly the nature of the effects of organizational signals on text recall and (b) to test alternative models of how signals operate to produce their effects. We begin by presenting a general framework for understanding text recall processes; then we discuss how organizational signals should influence text recall according to that framework.

Text Structure and Text Recall

Information acquired from reading varies in its accessibility from memory. In general, the accessibility of a text statement depends heavily on the degree to which the statement is integrated with other text content. In the case of expository text, statements tend to be well remembered if they subsume other text content in the hierarchical representation of the text (Kintsch, Kozminsky, Streby, McKoon, & Keenan, 1975; Kozminsky, 1977; Meyer, 1975). In the case of narrative, the probability and speed of retrieval of a statement is a function of the number of causal connections it shares with other text statements (Fletcher & Bloom, 1988; O'Brien & Myers, 1987; Trabasso & van den Broek, 1985).

The function a statement serves in a text also influences its accessibility. In narrative recall, statements that are involved in the progression of events from the protagonist's goal to the outcome (i.e., the causal chain) are better recalled than "dead end" statements that do not move the action forward toward a conclusion (Black & Bower, 1980; Omanson, 1982; Trabasso, Secco, & van den Broek, 1984; Trabasso & van den Broek, 1985; van den Broek & Trabasso, 1986). This finding demonstrates that readers attempt to reconstruct the sequence of events in a logically consistent fashion.

The number of connections of a statement and the function it plays in the development of a text typically covary extensively. For example, the protagonist's goal in an episode of a narrative occupies a prominent position on the causal chain and is connected with all the actions it motivates within the episode. Similarly, the topic of a subsection of an expository text is the focal point for the integration of the information it subsumes in the subsection. Whereas goals and topics are typically extensively connected with the content that follows their introduction, they are often not highly connected with the content that precedes it. Often a single link exists between the outcome of a story episode and the initiation of a new episode or between the conclusion of discussion of an expository topic and the introduction of a new topic. The implication is that a reader's ability to reconstruct the text at recall depends heavily on how well the reader encoded the transitions between episodes or topics while reading. If a transition is forgotten, the reader of a story will have lost a critical access route to the next episode, and recall may grind to a halt. Similarly, the readers of an expository text will likely fail to remember a subsection of the text unless an alternative cue is generated that provides access to the subsection.

In the case of narratives, transitions between episodes usually involve a clear semantic relationship (Trabasso & van den Broek, 1985; van den Broek & Lorch, 1993). For example, the protagonist may fail in an attempt to achieve some goal (e.g., Jimmy can't

Opening
<Define the factor

<Point out controversy

<This study

General background: What is known about the process in general
<integration

[Note the systematic use of author-inside citation style.]

<function of statement

<connectedness (goal, topic)

<causal transitions

buy the bike he wants because he doesn't have enough money), so a subgoal is established that will facilitate achieving the superordinate goal (e.g., Jimmy decides to get a job to earn more money). The tight causal structure of narratives generally makes them relatively easy to recall, perhaps in part because the transitions between episodes are relatively easy to reconstruct. In fact, McDaniel and Einstein (Einstein, McDaniel, Owen, & Cote, 1990; McDaniel, Einstein, Dunay, & Cobb, 1986) have demonstrated that narrative recall is aided more by elaborative processing at encoding (i.e., relating text material to prior knowledge) than by integrative processing (i.e., attending to relations between statements in the text), presumably because narrative content elicits integrative processing as a matter of course.

In contrast to transitions in narratives, the transitions between topics of expository texts often do not involve very strong connections between successive topics. For example, a descriptive text about a country may switch from discussing the geography of the country to discussing its political organization. The only clear relation between the topics is that they both represent important attributes of a country. If a reader does not systematically note such transitions and encode the text topics and their organization, subsequent recall will suffer because the reader will fail to access some of the topics in memory (Lorch & Lorch, 1985; Lorch et al., 1993).

<Weak conceptual transitions: a problem

Constructing a representation of an expository text's topics and their organization is an important requisite for text comprehension and for subsequent recall. However, the task of representing a text's topic structure is relatively demanding. In Gernsbacher's structure-building framework (Gernsbacher, Hargreaves, & Beeman, 1989; Gernsbacher, Varner, & Faust, 1990) and in Britton's analyses of the content of expository texts (Britton & Gulgoz, 1991; Britton, van Dusen, Gulgoz, & Glynn, 1989), the transitions between topics of an expository text represent major gaps in the text structure. At such junctures, a reader may attempt to bridge the gap and integrate the new topic with previous related text topics, or the reader may initiate the construction of a new structure, effectively treating the new topic as independent of previous text content. Under many circumstances, mature readers attempt to bridge the transitions between topics (Lorch, Lorch, & Matthews, 1985). However, if the text is poorly organized (Lorch & Lorch, 1985) or bridging the gaps is beyond the cognitive abilities or motivation of the reader (Lorch, Lorch, & Mogan, 1987), the reader may not infer the connections among topics and thus may fail to construct a coherent topic structure representation. These findings are consistent with McDaniel and Einstein's (Einstein et al., 1990; McDaniel et al., 1986) findings that integrative processing at encoding is particularly effective in aiding recall of expository text. If the topic structure representation is incomplete or incoherent, text recall is likely to suffer because some topics will not be accessible at retrieval.

<Note that the emphasis on how important this is for comprehension

Role of Organizational Signals in Text Recall

Specific background: What is known about the specific factors
<Evidence that this is important

Writers often try to help readers process a text's topic structure by using organizational signals to explicitly mark the text structure. Topical overviews, headings, and topical summaries can be used singly or in combination to explicitly denote the major text topics and their organization. Thus, they fill important gaps in the text's macrostructure and encourage the construction of connections between related text topics and between topics and subordinate content (Einstein et al., 1990; McDaniel et al., 1986). As such, the presence of organizational signals in a text should lead to a more complete and coherent representation of the text's topic structure than would occur in the absence of signals. In fact, it has recently been shown that signals do produce better memory for text topics and their organization (Lorch et al., 1993). Many theorists have predicted that the effects of signals on readers' topic structure representations should translate into better overall text recall. This prediction is based on the hypothesis that readers use their topic structure representations at recall to direct a systematic search of their text representations. Although readers do appear to use their topic structure representations to guide the search process at recall (Lorch & Lorch, 1985; Lorch et al., 1993), several studies have failed to demonstrate signaling effects on overall text recall (Brooks et al., 1983; Lorch et al., 1993; Meyer, 1975; Meyer & Rice, 1982).

There are at least two potential reasons that organizational signals have not been found to have consistent effects on overall text recall. One is that the effects of organizational signals on recall processes may be more complex than has usually been assumed. Previous researchers have implicitly assumed that once a text topic has been accessed during retrieval, recall of content subordinate to the topic should be unaffected by organizational signals (Lorch & Lorch, 1985). If this assumption is correct, then the

Closing paragraph
<Outstanding problems

increased accessibility of text topics resulting from signaling should translate into better overall recall. However, this assumption may be wrong. The presence of signals that emphasize text structure may divert the reader's attention from the subordinate content, with the result that the signals may produce poorer recall for subordinate content. If signals produce better memory for text topics but poorer memory for what was said about each topic, there may be no effect of signaling on overall recall. In fact, Lorch et al. (1993) found just such a pattern of counteracting signaling effects on topic access and recall of subordinate content.

The other potential explanation of previous failures to find signaling effects on overall recall is that ==the conditions under which signaling effects have been studied may not have been conducive to finding such effects==. Although readers may find signals useful aids, they do not require signals to process information about the topic structure of a text (Lorch et al., 1985). Under many conditions, readers may be able to construct complete and coherent topic structure representations without the aid of organizational signals. For example, if there are few topics and the topics are well developed and easily related to each other, readers may not need the help of signals in constructing a topic structure representation for the text (Spyridakis & Standal, 1987). This may explain the lack of signaling effects in several of Meyer's studies (1975; Meyer et al., 1980; Meyer & Rice, 1982).

<Outstanding problems

The ==first pair of experiments== tests these possible explanations of previous failures to find effects of organizational signals on overall text recall.

<This study…

Sample Lit Review #2

Halldorson, M. & Singer, M. (2002). Inference processes: Integrating relevant knowledge and text information. *Discourse Processes, 34*, 145-162.

There is wide agreement that ==text comprehension results in multiple levels of representation==. The levels include the representations of surface form; of the idea network, or "text base"; and of the situations to which the text refers (van Dijk & Kintsch, 1983). Recent investigations have indicated that text situation models include dimensions of causal, temporal, spatial, and other information (Zwaan, Magliano, & Graesser, 1995). Text causal structure in particular has been the subject of extensive scrutiny. Causal situation models have been proposed to capture the enablements and the physical, motivational, and psychological causes that interrelate text ideas (Schank & Abelson, 1977; Trabasso & van den Broek, 1985; Trabasso, van den Broek, & Suh, 1989). ==This analysis has been supported by== numerous realms of evidence: (a) People's text recall and their importance ratings of text ideas vary with the appearance of the ideas on the main causal chain of the text; and with measures of the interconnectedness of these ideas, as derived from the theory (Trabasso, Secco, & van den Broek, 1984; Trabasso & Sperry, 1985). (b) Text coherence depends on the reader's detection of causal relations among text ideas (Bloom, Fletcher, van den Broek, Reitz, & Shapiro, 1990; O'Brien & Myers, 1987; Trabasso et al., 1984; Trabasso & Sperry, 1985; Trabasso et al., 1989; van den Broek, 1988). (c) Readers' detection of the global relations among text ideas are regulated by the characteristics of the causal situation models posited to underlie text (Lutz & Radvansky, 1997; Richards & Singer, 2001; Suh & Trabasso, 1993; van den Broek & Lorch, 1993).

General background
<General theoretical framework

<Support for this approach

[Note the systematic use of author-inside citation style.]

One theoretical framework for studying the construction of causal situation models has been the validation analysis (Singer, Halldorson, Lear, & Andrusiak, 1992; Singer, Revlin, & Halldorson, 1990). This position states that a full understanding of the sequence Dorothy poured the bucket of water on the bonfire, The fire went out, depends on a bridging inference

<Specific theoretical framework

to the effect that the first sentence identifies the cause of the second. Before the bridging inference is accepted by the reader, it must be validated with reference to world knowledge. First, the reader derives from the text a mediating idea that tentatively accounts for how the causal antecedent brings about the outcome. For the present example, Integrating text ideas and relevant knowledge 4 the mediating idea might take the form, WATER EXTINGUISHES FIRE. If the mediating idea is substantiated by pertinent world knowledge, then the inference has been validated.

Support for the validation stemmed from the observation that it takes less time to answer Does water extinguish fire? after reading the causal sequence, Dorothy poured the bucket of water on the bonfire, The fire went out, than after the control sequence, Dorothy placed the bucket of water on the bonfire, The fire went out (Singer, 1993; Singer & Halldorson, 1996; Singer et al., 1992). Two control procedures complemented this result. First, there is no facilitation of Does water extinguish fire? when it simply follows the causal antecedent Dorothy poured the bucket of water on the bonfire relative to when it follows the control, Dorothy placed the bucket of water by the bonfire (Singer & Halldorson, 1996; Singer et al., 1992). Therefore, without the need to construct a bridging inference, relevant knowledge is not invoked in the manner specified by the model. Second, Does water extinguish fire? is facilitated after the inconsistent sequence, Dorothy poured the bucket of water on the bonfire, The fire GREW HOTTER (Singer, 1993). We propose that from the latter sequence, the reader derives a mediating idea like WATER FEEDS FIRE. However, validation requires the comparison of that idea with the general knowledge that water actually douses fire, which in turn accounts for the facilitation of Does water extinguish fire? in this context.

<Support for this more specific approach

One implication of the validation model is that validating knowledge becomes integrated with the text representation. Singer and Halldorson (1996, Experiment 5) used a delayed-priming procedure (McKoon & Ratcliff, 1988) to make an initial test of this principle. Participants read sets of three brief texts, and each set was followed by a primed question-answering task. We considered the possibilities either that (a) validating knowledge is integrated with the text representation or (b) validating knowledge is a catalyst for comprehension but is not integrated with the representation. The text outcomes primed the validating knowledge, a finding that supported the integration of validating knowledge and text ideas.

Specific background
<Specific hypothesis & support

The latter finding was consistent with analogous results concerning the integration of text ideas and knowledge about the implied properties of text concepts (McKoon & Ratcliff, 1988). McKoon and Integrating text ideas and relevant knowledge 5 Ratcliff's participants read sequences like The still life would require great accuracy. The painter searched many days to find the color most suited to use in the painting of the ripe tomato. McKoon and Ratcliff reported that, after reading, a relevant property of tomatoes was primed by a sentence from the corresponding text. For example, relative to an unrelated property of tomatoes, Tomatoes are red was primed by The still life would require great accuracy (McKoon & Ratcliff, 1988, Experiment 2).

These effects complement the converse findings that text information is integrated with general knowledge. A classic result of this sort is that the time that people need to verify familiar facts about a concept increases with the number of newly learned ideas about the concept (Lewis & Anderson, 1976). However, whether text information is integrated with world knowledge depends on the reader's predisposition to invoke world knowledge in the service of text comprehension (Potts & Peterson, 1985).

The present study was designed to explore the generality of our previous finding that relevant knowledge is integrated with the causal situation models derived from text. This aim took the form of two questions. First, do causal antecedents, like causal consequences, prime the hypothetically validating ideas? Second, after reading, is the priming of text ideas and validating knowledge mutual? It is to be expected that a text statement, serving as a prime, will provide memory access to its passage and thereby facilitate judgments about knowledge that has been integrated with the text representation. However, the evaluation of a knowledge prime, such as Does water extinguish fire?, does not demand access to any text representation. Therefore, we viewed the possible priming of text statements by validating knowledge to provide additional evidence of the integration of that knowledge with the text representation.

Closing paragraph
<This study

This very rationale was applied by McKoon and Ratcliff (1988, Experiment 5), and they demonstrated the mutual facilitation of text ideas, on the one hand; and knowledge that captured the relevant properties of text concepts, on the other. However, their study did not bear on the representation of text causal structures. To achieve the present aims, we again used the delayed-priming paradigm. In this procedure, each trial comprises three unrelated texts

<Methodological rationale

followed by a series of questions Integrating text ideas and relevant knowledge 6 about those texts and general knowledge. For the present purposes, the texts include an experimental passage, which can appear either in a causal or control version, as follows:

(1) a. The hiker shot the injured deer. The deer died. (causal)

b. The hiker examined the injured deer. The deer died. (control)

The crucial questions are arranged in prime-target pairs. In Experiment 1, the antecedent (Did the hiker shoot/examine the injured deer?) could function as the prime and the validating knowledge (Do bullets kill animals?) as the target; or vice versa. Central to the logic of this method is that causally related events, such as (1a), are more robustly integrated than other events, such as (1b) (Black & Bern, 1981; Keenan, Baillet, & Brown, 1984; Myers, Shinjo, & Duffy, 1987). Furthermore, the idea relevant to the validation of the causal sequence (e.g., bullets kill animals) ought to be integrated with the text representation in the causal condition but not in the control condition. As a result, we predicted that after people read the three passages of a trial, answer time would be lower when the experimental prime and target were linked by a causal relation than a different (control) relation.

Previous investigations have consistently revealed that sentences such as The deer died are read more quickly in the context of a causal antecedent (e.g., 1a) than a control antecedent (e.g., 1b) (Keenan et al., 1984; Myers et al., 1987; Singer et al., 1992). This outcome has provided additional evidence that sentence ideas are more readily integrated with causal than noncausal antecedents. We monitored this feature of the results, as a point of contact with prior investigations.

Sample Lit Review #3

Dillinger, M. (1994). Comprehension during Interpreting: What do interpreters know that bilinguals don't? In: S. Lambert & B. Moser-Mercer (Eds.), *Bridging the Gap: Empirical Research in Simultaneous Translation* (pp. 155-189). Amsterdam: John Benjamins.

A fundamental question for professionals involved in the selection, training, evaluation and hiring of simultaneous interpreters is that of what interpreters know that bilinguals do not. Do simultaneous interpreters know different strategies for allocating attentional and memory resources? for making sentence processing more efficient? for bringing prior knowledge to bear on comprehension? Answers to these questions are important in that they can provide the principles on which to base assessment of proficiency and aptitude, planning of training, and on-going improvement of professional performance.

Although simultaneous interpreting has received increasing attention as an object of study (Mackintosh, 1985; Henry & Henry, 1987; Gile, 1988), unfortunately little of it has been in the form of reliable experimental research (Gile, 1988). Few studies have attempted to identify and characterize the component processes of interpreting, but several have studied the global effects of factors such as input rate and what strategies professional interpreters may use to exploit pauses in the input.

The effects of input rate on interpreting accuracy have been studied in most detail by Gerver (1971a): when professional interpreters were asked to interpret texts presented at 95, 112, 120, 145 and 164 words per minute (wpm), the proportion of the text that was correctly interpreted decreased with each increase in rate, and ear-voice span (EVS) increased. As well, interpreters maintained a steady output rate, paused more, and spoke less as rate increased. Accuracy of translation was optimal when the rate of presentation was between 95 and 120 words per minute. In comparing these results to the significantly better performance of subjects shadowing the same texts (i.e., concurrently listening to the text and repeating it in the same language), Gerver interprets the differences as accountable by Foulke and Sticht's (1969) finding that increased presentation rate poses problems for higher-level processing rather than for perception. Treisman (1965a), using rates of 100 and 150 wpm and statistical approximations of English and French texts, found a similarly significant effect of information rate on efficiency of interpreting.

Another important question about the nature of the input is how the interpreter segments it. Barik (1969) suggested, drawing on Goldman-Eisler's (1968) work, that the interpreter might use pauses in the input text to divide it into meaningful segments. Goldman-Eisler (1972) found that 48% of the time interpreters started speaking before the input chunk (utterance between pauses) had finished, 41% of the time they waited for two

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Opening

< Importance for assessment, planning, training

General background: we don't know much about how simultaneous interpreting works

Specific background Focus on one factor: input rate

Focus on one strategy: segmenting the input

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or more chunks, and only 11% of the time did they wait for a pause after a chunk to begin encoding. Gerver (1971b), based on Suci's (1967) finding that pauses in spontaneous speech tend to delimit well-formed syntactic units, had subjects interpret texts with normal stress and pausing vs. texts with minimal stress, intonation and no pauses of more than 250 msec. In the texts that Gerver's interpreters produced, 55% (pause condition) vs. 32% (no pause condition) of the pauses occurred at major constituent boundaries, 30% vs. 42% occurred between minor constituents and 15% vs. 26% occurred within minor constituents. As well, significantly more words were correctly interpreted in the pause condition, so he concluded that pauses do assist the interpreter to segment the input text. Also with respect to segmenting, Golman-Eisler (1972: 131) found that in 90% to 95% of the cases in her study, the interpreter's segment consisted of "at least a complete predicative expression".

Some authors have suggested that interpreters try to ==optimize their use of input text pauses== so as to reduce the strain of listening and speaking simultaneously (Barik, 1969, 1973; Goldman-Eisler, 1968; van Hoof, 1962). In favor of this view, Barik (1973) offers data from a study in which he calculated the proportion of input text pause time that interpreters would be expected to use for speaking if their speaking was independent of input text pauses. Barik's obtained values were greater than those expected (no inferential statistics were reported), and he concluded that interpreters indeed make use of input text pauses as much as they can. As well, he cites the coincidence of values for mean chunk length and mean EVS in favor of this hypothesis. However, Goldman-Eisler (1968) found that the majority of pauses were of one second or less, and Gerver (1975) found that 83% of speakers' pauses in a conference setting were of less than one second in length. Gerver argued that since he found interpreters to have an articulation rate of between 96 and 110 wpm, there was not in fact very much that the interpreter could put into such pauses: only about four or five syllables. In another study, Gerver (cited in Gerver, 1976: 183) measured the amount of time interpreters actually spent speaking during the presentation of the source-language text, and found that speaking and presentation were simultaneous between 64% and 75% of the time. Goldman-Eisler and Cohen (1974) and other authors also found similarly high values for this measure of simultaneity of listening and speaking.

Currently, ==little is known about the differences between experienced and novice interpreters' performance, and nothing at all is known about any possible differences in the way they go about carrying out the task== (Dillinger, 1989). In most studies, it is assumed and/or asserted (without evidence) that the skills of interpreters are not characteristic of bilinguals in general (Gerver, 1976: 167), and that the models developed of skilled interpreting do not apply to novice bilingual interpreters (Moser, 1978: 361). Harris (Harris & Sherwood, 1978), however, argues that translation ability is a natural consequence of bilingualism. If this argument can be extended to interpreting as well, then it will suggest the existence of few or small expert-novice differences, as does the once-current view among interpreters that "no special training was required [for interpreting] and that it all depended on an innate special skill" (Longley, 1978: 47).

More specifically, Nida (1969, cited in Gerver, 1976: 198) predicts that "experienced simultaneous translators may often short circuit the deeper [semantic] level of analysis", although there is no evidence either for or against the hypothesis. Experts have, however, been found to add more information and delete less (Barik, 1969), process larger chunks, and give less literal translations (McDonald & Carpenter, 1981).

==The research reported here== was carried out in an attempt to address, in a systematic fashion, the question of whether there are qualitative differences in processing between novice and experienced interpreters, and thus to provide an empirical base for characterizing the nature of interpreting skill. Rather than attempting to study interpreting in all its complexity, however, this research focused only on the interpreters' comprehension processes to permit more detailed consideration of them. Translation *per se* and production processes were left for further research.

To address the issue of possible differences in comprehension processing, bilinguals with no interpreting experience were contrasted with experienced conference interpreters with respect to the degree to which their interpreting performance reflected different degrees of comprehension of the source text. The general question about this half of interpreting skill was broken down in to more specific questions about the different kinds of syntactic and semantic processing going on in comprehension during interpreting.

Focus on one topic: how much interpreters use pauses

Specific problem: differences between expert and novice interpreters

Closing paragraphs
The parts above emphasized that little was known, so this goes right into describing the present study

Glossary

General background	The part of the Lit Review that focuses on how the process and sub-process work, to help the reader understand the details of the experiment.
interaction	How multiple factors work together or interact. The factors may be independent, they may cancel each other out, or they may have an additive effect on the process under study.
Lit Review	("literature review", "review of the literature") A description of what has already been studied about a process, sub-process, an one or more factors.
motivation	("justification", "importance") The reasons why it is important for a research study to be done. The *motivation* of the study usually appears in the Opening.
process, sub-process	One of the psychological activities that underlie behavior. A *sub-process* is one step or phase in a multi-step *process*.
Specific background	The part of the Lit Review that focuses on *how the specific factors affect the process and sub-process*, to help the reader understand the details of the experiment.

Further Readings on Writing a Lit Review

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