Scientific Writing for Publication

Scientific Writing for Publication:

A Transdisciplinary Approach

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OVERVIEW OF AN INTERDISCIPLINARY APPROACH TO WRITING

Overview

Think about the last time you started a research project. Why did you start? Maybe there were gaps in knowledge or problems in the field, or maybe you had some general questions or hypotheses that have not yet been addressed. As researchers, we often take steps to address these concerns. In the case of experimental research, we may try and try again to get noteworthy results, and once we get those results, what's next? At that point, we want to communicate our research, often in the form of writing. But scientific writing is not easy.

There are thousands of researchers globally who struggle to communicate findings in high-impact journals. So, how does one become a successful research writer? Of course, there are many ways to become successful, but we will introduce you to a four-step scientific writing process to help you publish peer-reviewed journal articles to a discipline-specific audience. Throughout this process, you will learn how language shapes our knowledge and helps explicitly communicate research contributions with meaningful connections to one's field.

Step 1: Learn. Learning how to efficiently read research articles for not only content but also writing conventions will help you understand how published researchers communicate. In each chapter, you will be introduced to communicative goals, strategies, and language use features for each section of a traditional empirical journal article (i.e., Introductions, Methods, Results, Discussions, and Conclusions). While some disciplines vary in how journal articles are organized, the concepts introduced in this book apply to a wide range of disciplines because the process includes the skills of learning to read through a critical lens in order to be a better, disciplinary-specific writer.

Step 2: Analyze. The second step is to use your acquired reading skills for analyzing model articles in your field. This step will help you visualize variations in argument structure by noting language use patterns that are indicative of scientific writing. Reflecting on discipline-specific writing conventions is integral to this step so that you can begin internalizing the content as you transfer your skills to writing.

Step 3: Explore. Exploring additional language use patterns in your field will help you identify how language shapes meaning. These patterns represent universal language that scientists use to communicate to other scientists. These patterns can be used as a springboard for constructing patterns for use in your own writing, helping you meet the expectations of scientific readers in your field.

Step 4: Write. And then finally, after analyzing scientific writing conventions in your field, you will be ready to apply your skills to the writing of your own research. Writing, like any other acquired skill, takes time, but with this four-step process, you will learn to focus your time on the task so that you can overcome those challenging times. Those times when you don't know what to write or even worse; how to write. In this step, you will practice your writing skills, obtain feedback from experts in your field, and work to improve your research argument and establish the value of your research.

CHAPTER I

CHAPTER ONE: GETTING STARTED WITH SCIENTIFIC WRITING

This chapter will help you conceptualize your research in preparation for starting the scientific writing process. We will do this by first discussing how to think about and share the basic premise of your research. We will then identify a publication venue and prepare take-home messages. Additionally, you will be asked to compile a collection of research that you will analyze as we learn. Finally, we will explore the overall structure of a traditional peer-reviewed journal article before we break down each section in subsequent chapters.

HOW TO THINK ABOUT YOUR RESEARCH

Stephanie Link

Most research can be categorized into three main types. Basic or conceptual research is when we explore ideas or theories for the purpose of developing new concepts or reinterpreting existing ones. Applied research goes a step further by moving closer towards a solution for an immediate problem.

And then, practical research provides direct answers for what we should do to fix a problem. If you are conducting basic research, your argument should be largely theoretical with your contributions seeking to advance theoretical understanding.

In applied research, the way your topic is problematized should derive from a practical, empirical, methodological, and/or theoretical argument and provide potential implications for addressing one or more of those areas. Practical research is also problem-centric, usually contextualized around a lack of resources for achieving expected outcomes.

These types can be viewed on a continuum of purely conceptual to purely practical, and a whole world of research in between. In the following sections, we will focus on empirical research writing in any of the research types, but if you are completing other types of writing (e.g., a state-of-the-art review, model development article, or conference paper), the skills you acquire will help you write those pieces as well. They just won't be the emphasis here.

With this said, what type of research will you be writing? Complete the activity below to reflect on your research type.

Activity: Conceptualizing your Research

The argument structure for your manuscript should reflect a specific research type. Identify what research type represents your current project. Then, fill in the blanks with specifics from our topic. This activity will be especially helpful when selecting a target journal (Section 1.2) and outlining your take-home messages (Section 1.2).

Basic:

1. I am working on the topic of _____
2. because I want to find out how/why/whether _____.
3. so that I can help others understand how/why/whether _____.

Applied:

1. I am working on the topic of _____.
2. because I want to find out _____.
3. so that I can understand _____ to solve _____.

Practical:

1. I am working on the topic of _____.

2. because I want to find out _____.
3. so that I can tell others what to do to fix/improve _____.

SELECTING A TARGET JOURNAL

Some journals only publish certain research types or are inclined to accept certain research types over others. For example, journals that are highly theoretical expect theoretically-oriented research and may reject practical research due to a potential lack of conceptual underpinnings.

Thus, it is important to select a publication venue that fits your research type as well as topic or field. You may have already determined a publication venue, maybe because there are only a few options or perhaps you've discussed this topic with your research mentor. Regardless of what stage you are at, there are a few points you need to consider.

First of all, not all journals are created equal. Some journals are higher quality than others, often due to the qualifications of the editorial board, the rigor of the review process, and the reputation within a field. Of note is that some journals may be classified as predatory, or journals that are more interested in the advancement of the journal itself than in the advancement of knowledge. A key to avoiding these journals is to know what you are looking for in a quality publication venue.

Here are some key considerations:

- **Aim or scope.** As stated previously, some journals may focus on certain types of research. They may also focus on specific genres of research, like an emphasis on state-of-the-art reviews rather than empirical work.
- **Audience.** You want to target journals that have recently published similar research as an indicator of their interest in your work. Knowing your audience will also help you focus your messaging and determine the amount of background information you need to present on your topic in order for your readers to grasp your research context.
- **Fees.** In some fields, it's rather normal to have to pay some fees to get your article published or to make your article open access or to have images in color. But, be careful! In other fields, this is definitely not the norm and more representative of a predatory journal.
- **Open access options.** There are some journals that are open access and highly regarded in different fields. These are rare, but they are definitely out there. If you find value in having your study more widely available, then an open access option may be what you are looking for. Other options may be open datasets or open supplemental material. When choosing open source, you should also become familiar with creative commons licensing to understand how your work is protected.
- **Quality.** Journals are often considered low-range, mid-range, or top-tier. Whenever in doubt about the quality of a journal, it is best to consult a research mentor. Impact factors have come under some criticism lately, but they still exist and in some fields they are quite relevant. Impact factors are based on multiple metrics, but the most

common is the number of citations to recent articles a journal receives—an indication of the journal's overall reach.
- **Time to publication.** If you are a student or early-career faculty, sometimes time to publication is key to your next job or promotion. This is also important if you have a cutting-edge study that you must publish as soon as possible. Some journals have started reporting time to publication on each publication near author information. If not available, you could consider contacting colleagues who have published in the journal previously to hear their experience.

It's also important to note that sometimes top-tier journals are not the best venue for your research. Of course, those are the journals to aim for and publish in eventually, but if you are just starting out, it's best to get some expert advice because mid-range journals may be a better option. So, which of these considerations is most relevant to you? Take some time to explore three to five journals in your field for match of scope, audience, quality, time to publication, open access options, and fees.

Activity: Selecting a Journal

Fill out the following information in a new document or in a research notebook, along with the finding author's guidelines for the journal you choose for initial submission of your manuscript.

1. What is your discipline/field of study?:
2. What are the top three journals in your field?:
    - Journal 1:
    - Journal 2:
    - Journal 3:
3. Consult with a disciplinary expert or an accomplished writer in your discipline. Seek out their opinion about the best journal for your future publication. Is this journal on your list of top three journals? Why or why not? Why is this journal suitable for publishing your work?
4. Find the instructions to authors for your chosen journal and highlight or note any of the following:
    - Aim or scope:
    - Audience:
    - Fees:
    - Open access options:
    - Quality:
    - Time to publication (average):

If you change your choice of journal at any time during the writing or review process, you should reflect these considerations again.

TAKE-HOME MESSAGES

Now that you've hopefully chosen a journal or at least narrowed your selection, it's time to think about your main messaging. You may think of this message as your take-home message, or the central claim(s) of your research argument. It is important to note that your research should argue for a position. This position may emphasize why your overall research is important or relevant or why your principal findings are applicable or noteworthy. Whatever your argument or main message is, it should surface throughout your article—from beginning to end.

Thus, take-home messages are really the central messages or ideas you want the reader, every reader, to grasp at the time they have finished reading the article. You can form a take-home message or messages by transforming one or more primary findings from your research into a concept or idea. Your take-home message may even be theory-driven so that your work contributes theoretically to the current state-of-the-art.

Before you move on to begin writing, what is the message that you want to convey throughout your article? How can you answer the question, "So What?" What is your contribution and how does your data support your central message? I would like you to think about these questions in the next activity.

Activity. Constructing your Take-home Messages

In a notebook or document, please note the central message(s) that you hope to communicate in your study. What you note here should be clearly communicated throughout your manuscript, so it is important not to make your manuscript too complicated. Sometimes, one or two take-home messages are best, depending on the nature of your data.

Take-home message #1:

_____
_____

Claims or Evidence that supports this message:

_____
_____

Take-home message #2 (optional):

_____
_____

Claims or Evidence that supports this message:

_____
_____

Take-home message #3 (optional):

_____
_____

Claims or Evidence that supports this message:

_____
_____

Take-home message #4 (optional):

_____
_____

Claims or Evidence that supports this message:

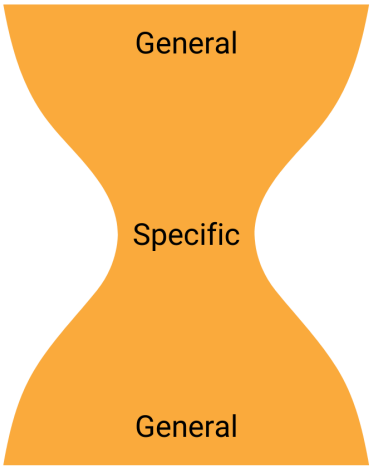
_____
_____

ANATOMY OF A RESEARCH ARTICLE

As mentioned previously, we will be focusing here on empirical research articles, which are quite different in structure from other genres such as state-of-the art reviews, letters, or brief notes. Apart from the humanities and some social sciences disciplines, the anatomy of a typical empirical paper is similar across fields. Most articles will contain an Abstract, Introduction with a combined or separate Literature Review, a Methods section, Results with a combined or separate Discussion, and an optional Conclusion.

In most cases, the structure is associated with an hourglass shape, meaning that the content progresses from general to specific and then specific to general. There is variability, however, from article to article and journal to journal. Let's take a look at some of your section options.

- **Introductions** begin with a broad focus to gain your readers' attention by expressing interest or value in your topic. Here, you also begin your research argument by expressing the problem, gap, or lingering questions or hypotheses in the field. You should also include information about your present work, like your purpose statement.



Hourglass structure of traditional empirical research articles

- **Methods,** or its equivalent, establish credibility for the results by illustrating the rigor of your research design. In some disciplines, the Methods section comes at the end of the Discussion. Oftentimes, the section is renamed Procedures or Experimental Design.
- **Results,** in their simplest form, provide an objective report of the findings. A pure Results section is most common when outcomes are straightforward or short in

length.

- **Results and Discussions** are often combined. This combination is most typical when the Results are complex and require immediate discussion to assist the reader with comprehension. In other cases, one set of results may need to be discussed before the next set of results can be understood. Sometimes, combining these sections is the norm in the field and done regardless of the nature of the study. Although it's common to see Results and Discussions sections together, there are some instances when each result is followed immediately by the relevant discussion, making up multiple Results and Discussion subsections.
- **Discussions,** often combined with the Conclusion, start with a similar breath and focus as your results but then broadens its emphasis to address wider issues beyond the study. This is the bigger picture, and it should tie back to the starting point in the paper—the Introduction.
- **Conclusions,** when written as an isolated section, not only provide a summary of key take-home messages but may offer statements of value (e.g., general contributions, implications, applications), study limitations, and future suggestions.

To determine the structure of your paper, it's important to analyze articles in your field. Take some time to find several model articles in your target journal. Model articles may be representative of a similar research topic, or it may be a model because of the quality of writing or the quality of the research as a whole. You may also determine that different models hold different purposes. Maybe one article is a model for your Methods while another is a great model for your Results. Complete the activity on the next page to get started.

ACTIVITY: CHOOSING A MODEL ARTICLE AND COMPILING A CORPUS

This task is intended to help you build a collection of texts that are strong representatives of your discipline and research topic. These sample research articles will be used as writing models throughout the research writing process to help you develop your own manuscript. The discipline-specific corpus should contain no less than 10 articles relevant to your area of study so that you have a variety of writing styles from which to learn.

Compile your research articles corpus according to the following criteria:

1. Choose from the three highly regarded journals you selected and justified for the "Selecting a Journal" activity and the journal where you will submit your final manuscript, if they are different.
2. Published within the last five years (This may not always be possible, but try your best to find recent publications because writing conventions change over time.).
3. Written by different authors
4. Contain separate Abstract, Introduction, Methods, Results, Discussion/Conclusion sections or equivalent sections
5. Are full peer-reviewed journal articles

You may want to ask your writing mentors to holistically evaluate the quality of the papers you select based on the quality of writing, the quality of research done, and the quality of visual presentation (e.g., figures, tables, graphs). They may identify papers that are relatively poor in terms of one or more of these criteria, so you will have to replace them with articles that would be better models of writing in your discipline. You may ask your mentors to recommend research articles, the quality of which they think is very good or excellent. It is important that you have good models of empirical research writing to grasp the expectations of your field.

You may find that as you go along, your "primary" article may change for various reasons. For example, you may realize that the article you chose is not representative of the writing style you are trying to achieve or perhaps the article is a good model for an Introduction but not for a Methods.

CHAPTER II

CHAPTER TWO: INTRODUCTION SECTIONS

Your scientific argument starts from the Introduction section—a section that is meant to captivate your readers and sustain their attention as you argue for the value of your work. Here, we propose a four-step process that can help you succeed in establishing this argument. More specifically, you will learn skills for how to read and analyze published empirical research articles within your field of study to better understand the writing conventions of your discipline. Furthermore, you will learn how to integrate those writing conventions into your Introduction section. In what follows, we discuss the purpose of the Introduction sections, their typical format, and the writing techniques that can help you achieve your argumentative intent. But first, let's think about what you currently know about the Introduction sections so that we can build upon that knowledge. Think about the following questions, and if possible, discuss them with a peer or a fellow researcher:

1. Why are Introductions important?
2. What kind of information do you expect to see when you read an Introduction?
3. What makes an Introduction ineffective?

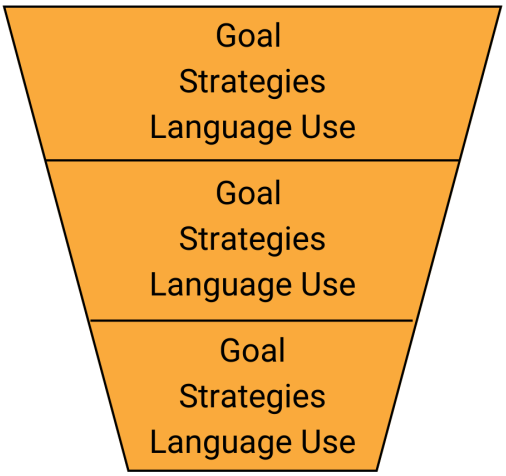
The Purpose

An Introduction presents a scientific argument that showcases credible knowledge of the field, identifies an area that needs to be addressed by research, and indicates a research trajectory that will contribute new knowledge to society. An Introduction conveys new knowledge to the reader without the obligation of knowing previous research in the field. It should have a clear aim by providing basic information regarding the study/research of the paper (Armağan, 2013). Additionally, it is the first step to arouse and gain a reader´s attention to continue reading the article. There are a variety of research genres that begin in this manner, such as peer-reviewed journal articles, conference proceedings, and theses/dissertations. These genres intend to persuade an expert audience and help them identify with the research value. In other words, scientific writers need to gain and maintain the attention of a target audience by demonstrating knowledge of the research topic and showing topic relevance. It is important to meet this aim by clarifying what concerns exist in the field as a way of grounding the scientific argument. Moreover, identifying what is unique, novel, or significant about the research and clarifying research specific aims and scope are common expectations of Introductions. Some disciplines will also expect that writers touch upon the most important findings or give a roadmap of the text.

It is best to make the Introductions brief. You need to hit the heart of your argument before you lose your reader in the fine details of the study. If your discipline has a separate literature review, you can substantiate your claims in that section. Be as clear as possible so even the non-specialist in your field can understand your Introduction!

The Format

Although understanding the purpose of Introductions is important, successful audience engagement relies also on the extent to which a text aligns with discipline-specific formatting conventions. In other words, texts vary in the way they are organized. An Introduction of a scientific argument takes a formatting approach that is analogous to a funnel. As you can see, the top of the funnel is wide and then narrows. This is because a typical Introduction section progresses from either general to specific or abstract to concrete. That is, an Introduction needs to move from general accounts of the scientific area to specific illustrations of the research topic, or from abstract to concrete specifications of what the research intends to address. To realize the formatting expectations of a discipline effectively, the Introduction needs to draw from a body of recent and/or relevant existing research/theory to start an argument (Goal 1), identify an area in that research/theory that needs to be addressed (Goal 2), and segues into details of the current study (Goal 3). The following sections describe these Goals and how to realize these goals using key Strategies and Language Use.



Funnel Format of Introduction Sections

GOALS, STRATEGIES, AND LANGUAGE USE IN INTRODUCTIONS

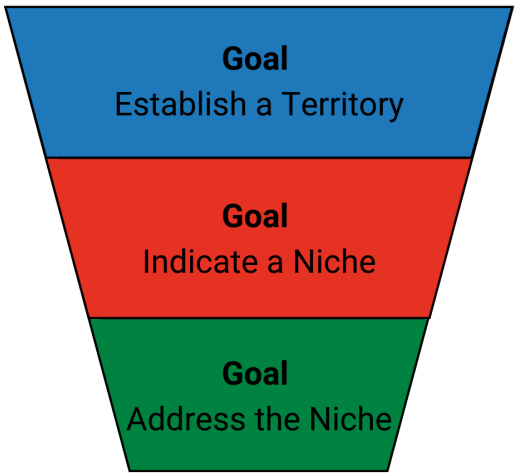
To become a strong disciplinary-specific writer, researchers need to first become good scientific readers. This section introduces a set of reading-to-write tools that are needed for producing an effective Introduction section. In other words, by using key tools as analytical aids when reading articles, writers can gain a heightened awareness of how to write articles with similar conventions. In this way, researchers can read articles with duo purposes—reading to develop content expertise alongside disciplinary writing expertise. The tools will thus help with time efficiency and writing productivity by facilitating the development of analytical skills, the increased awareness of how words shape meaning, and the transfer of that knowledge to communicating research clearly and effectively in writing.

There are different tools for each section of the research article, and all these tools can be categorized into three sets: **goals**, **strategies**, and **language use**. *Goals* are used to communicate your overall argumentative intent. *Strategies* are used to achieve your goals, and *Language Use* connects the goals and strategies in meaningful ways to enable explicit and cohesive expression of ideas. The following sections describe each of the tools, but it is first important to note that the use of these tools is dependent on variations across and within disciplines and changes in personal styles of writing. The objective is not to confine you to a toolbox but to enable you with analytical resources that can expand your understanding of writing and develop your writing skills.

1. *There are three overarching goals of an Introduction section. What do you think they are?*
2. *What common language expressions (e.g., recent research has investigated...) have you used in Introductions? Why are these expressions important?*

COMMUNICATIVE GOALS IN INTRODUCTIONS

The first set of tools is called *Goals*, which help to communicate the overall argumentative intent in the Introduction section. As the overall purpose of Introductions is to establish a strong argument, three major goals need to be fulfilled to realize this general purpose. Do you remember the funnel introduced earlier? Now we will contextualize these three goals within the Introduction's wide-to-narrow funnel format. While we introduce these goals linearly, your writing may not follow this linear pattern. We will discuss this more as we continue to further sections. It is also important to take note of the colors used for the funnel. These colors are metaphorical representations of the content we expect to see when achieving each goal. As we move from the level of Goals to Strategies, these abstract metaphors will be paired with concrete Language Use features to help you better understand the composition of research in your field. Let's take a closer look at these Goals before we provide you with Strategies for achieving these Goals!



Three Communicative Goals in Introductions

Goal One: Establish a Territory

The first Goal that we will introduce is to *Establish a Territory*. The purpose of this Goal is to portray the bigger picture of the research topic to the target audience. This Goal is analogous to envisioning an expansive, BLUE sky with some clouds. This blue sky represents the most recent and relevant literature that is needed to establish your research topic area—or your research territory. Clouds in the sky begin to suggest a lack of clarity in the topic area. By establishing your research territory, you can demonstrate knowledge of your topic and claim its relevance in the field while helping to segue into a research niche, or Goal 2: *Indicate a Niche*.

It is often hard to determine how much of the research territory needs to be communicated in the Introduction. There are a couple of points to consider here. First, start with the most recent literature (work from the past five years) and relevant literature (work that is closely related to your main topic area). If you start to see some of the same work cited in your initial collection of articles, you can then begin to expand your scope. Second, avoid including peripheral topics (information that does not directly contribute to your central argument). Peripheral information may distract from your claims and over-complicate your research argument.

Goal Two: Indicate a Niche

To understand the Goal, *Indicate a Niche*, let us continue with the same sky metaphor. Across the blue sky, clouds may make the view unclear. This lack of clarity should raise concern, which we represent metaphorically as a RED light. Stop! Warning! Thus, the purpose of this goal is to explicitly call attention to problems in the field or topic area. The red here can also be seen as the heart of an argument. It is important to introduce the heart of your argument as quickly as possible in your writing so that your text is not too blue. In other words, if your writing starts with a substantial amount of information to establish a research territory, the text will be perceived as descriptive rather than argumentative.

A great tip is to try your best to get into the RED of your argument as quickly as possible. If you can Indicate a Niche before the end of your first paragraph or beginning of your second, you will ensure that your reader understands the central claims in your argumentation.

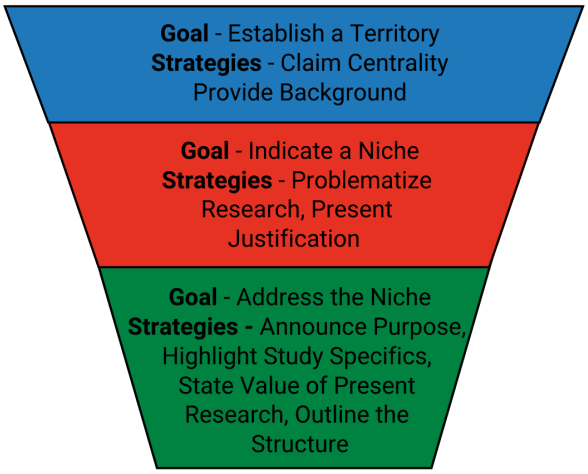
Goal Three: Address the Niche

Once you have established your territory and indicated your niche, you are likely ready to *Address the Niche*. The purpose of this Goal is to highlight how your work will directly add new knowledge to your research territory (the BLUE sky) and attend to the concerns raised within the territory (the RED light). Once you communicate these points, you can begin flashing your GREEN light. Green means GO! Go for it! Show your reader how your work will contribute new knowledge to the field. This goal is where you address the niche by stating your research purpose, value, structure, or even research outcomes. We will discuss these strategies in the following sections.

The structure of the Introduction is usually from general to specific. Although this is a very typical organization, this organization is not mandatory. While many researcher writers begin their Introduction with Establish a Territory, others jump right into Indicate a Niche, often because the problem they intend to address is well-known or widespread. It is rare to begin an Introduction with Address the Niche, although some writers choose this organizational scheme, which is especially common when writing Abstracts.

Writing Strategies for Achieving Goals in the Introduction

In the next sections, you will learn about the **EIGHT** Strategies that will help you achieve the three Goals of Introductions. These Strategies will be useful for (1) analyzing model articles by visualizing how published authors achieve their communicative goals and (2) facilitating your writing process by helping you utilize similar strategies while maintaining your individual style and identity as a researcher. In this section, we will also provide examples of the Language Use for realizing each of the strategies.



Overview of Goals and Strategies for Introductions

WRITING STRATEGIES FOR ESTABLISH A TERRITORY

As was mentioned in the previous section, the purpose of *Establishing a Territory* is to demonstrate knowledge of your topic and its relevance in your field. You can achieve this Goal by using two main writing Strategies: *Claim Centrality* and *Provide Background*.

Strategies for Achieving Goal - *Establish a Territory*

WRITING STRATEGIES FOR CLAIM CENTRALITY

Claim Centrality is to help grab your reader's attention. This strategy is used to claim that your topic is interesting, important, and/or prominent in the field. How could you claim the centrality of your research topic? As you might have correctly guessed, Language Use is the key in producing cohesive and explicit messaging. In other words, Language Use helps you connect Goals and Strategies to achieve a meaningful, well-structured text. To understand this better let us look at several examples:

a. "**Recent research on** artificial intelligence **has generated great interest in** the Internet of Things, or IoT."

b. "T**he importance of investigating** interactions, including gestures along with speech between teachers and students, is increasingly recognized."

c. "**Over the past 40 years, one of the most extensively researched topics** in second language acquisition **has been** the role of conversational interaction."

In example **a**, the bolded words are used to highlight recent *interest* in the research topic. Example **b** argues for the topic's *importance*, and in example **c**, the bolded words identify the topic as *prominent*. The language of interest, importance, and prominence can be used to suggest the value of the broad research area, to segue into some general information or previous research in the area, and also to foreground a problem. In the examples above, the bolded words represent explicit patterns in Language Use. These patterns are **NOT** discipline-specific. They can be used by any scientist to communicate with other scientists. You have likely seen these patterns while reading, but understanding the purpose of these patterns or how these patterns are used to achieve specific Goals and Strategies should raise your awareness of the role language has in communicating an argument.

When using Language Use patterns in your writing, there are some important points to understand. First, patterns should not reflect the ideas of researchers. Ideas of researchers should be adequately cited using your discipline's citation style of choice. If you do not cite the work of researchers appropriately, this is called plagiarism! ***Plagiarism is a major academic integrity issue****, and your work could be immediately rejected. Second, it is important that you do not read a single article and pull multiple Language Use patterns into your writing from that article. It is best to note patterns from a wide number of articles and use the patterns you identify to begin forming your writing style. As you develop as a research writer, you will become increasingly less reliant on the patterns of other writers and more autonomous in creating patterns of your own.*

Following is a list of the Language Use patterns for Claim Centrality. Be on the lookout for more as you analyze articles in your field.

- The increasing interest in … has heightened the need for
- …..attract great attention due to…
- Knowledge of … has a great importance for…
- …play a key/an important role in …
- …are absolutely essential since they can be used …
- Many experimental investigations on … have been conducted

WRITING STRATEGIES FOR PROVIDE BACKGROUND

Provide Background is used to build background knowledge and knowledge on the subject of research. This knowledge may be known information, like a well-known fact or theory. It may also be a general claim or evidence. General claims and evidence are usually coupled with explicit reference to literature, which is important for justifying that your research territory is indeed worthy of researching and that your research fits well within the existing research.

As mentioned before, *Provide Background* helps to establish the research territory by helping writers shape the reader's informational or conceptual knowledge of the topic. By doing this, we also identify for the reader the current state-of-the-art on the topic and lay a foundation for further discussion. The Language Use patterns in this strategy are harder to identify as compared to *Claim Centrality* as the language use is general. The following examples illustrate this better:

- "Research writing **is** a complex process affected by a range of individual factors."
- "**There is now much evidence** to support that face coverings are saving lives during the pandemic **(e.g., Authors 1, Authors 2, Authors 3).**"

Example a is a very general statement that is a well-known fact. Thus, this general background does not require a citation. However, the sentence following this general claim should delve deeper into either the complexity of the writing process or the individual factors affecting the writing process. These more specific pieces of evidence should be well supported by in-text citations. Sentence b is more controversial and has been refuted in everyday discourse. Therefore, it is imperative to include citations. By stating there is **much** evidence on this topic requires that there are more than one or even two citations to back up such a claim.

Another important point to highlight is the verb tense used in general statements. Many times, you hear from your research mentors that you need to maintain a consistent verb tense in your research writing. However, the verb tense is not as simplistic as it sounds. For example, the present tense in example a is used to communicate a general statement. **The present tense** is typically used to provide general information, to make references to generally accepted knowledge of the field, and introduce arguments, claims, statements, and suggestions (e.g., argue, suggest). **The present perfect tense** is often used to introduce the area of inquiry, make references to an ongoing research agenda, or synthesize the relevant literature on your topic. Present perfect verbs may include: have investigated, have focused on, have examined; have concluded. Sentences containing these verbs typically include citations to previous research.

Providing too much or too little background information is difficult to balance. You need to consider what information is most important for achieving your argumentative intent. When providing background knowledge on your topic, it is good practice to focus on the recent empirical and theoretical literature to support claims and decisions made throughout the study. But, if you provide too much without getting into the heart of your argument (the RED), then remember that your text may read too much like a descriptive or historical account of your research area. This form of writing may be more relevant to state-of-the-art reviews or conceptual papers.

To successfully utilize this strategy, the following language patterns might come in handy, but there are many more patterns to be found in published articles.

- The growth and development of … can be divided into two main sets of events…
- It is logical to accept that…
- There are models that have been developed to…
- Much of the research on … has been anchored in…
- Prior related research documents…
- …has been reported to…
- This issue was featured in empirical work by…
- …were the focus of Author et al.
- Author (Year) addressed the…

Do not feel obligated to use both of the strategies Claim Centrality and Provide Background since their use depends on your writing style. After analyzing model articles in your field and on topics in your research territory, you will learn which strategies are frequently used so you can follow a similar structure. With this said, Claim Centrality is very common. You will usually find this Strategy in the first sentence of the Introduction sections. Provide Background is a more prominent Strategy. It is rather safe to say that this Strategy is obligatory.

SUMMARY: ESTABLISH A TERRITORY

Let us recap the Goal of *Establishing a Territory*:

1. *Establish a Territory* is used to foreground what is generally known and what has been previously researched in the field. It also emphasizes what is central and significant in the field. Referencing literature for different purposes is also frequent in this Introduction goal.
2. The Strategies that can help achieve this Goal include *Claim Centrality* and *Providing Background*.
3. The Language Use must tie together the Goal of *Establishing a Territory* with its Strategies in an explicit way so that your readers do not have to "read in-between the lines" or make inferences you do not intend to communicate.

If you want to communicate that your topic is valuable, you should use language that expresses *interest, importance, or prominence*. If you want to describe shared knowledge, you should state general information or conceptual frameworks. If you want to describe a research tradition, you should synthesize previous research on the topic.

WRITING STRATEGIES FOR INDICATING A NICHE

As discussed above, *Indicate a Niche* can be signified by the color red, which stands for warning, caution, or stop. The Goal of *Indicate a Niche* is to communicate limitations or incompleteness in the current state-of-the-art. This communicative Goal helps express your own voice by arguing that there is a need for action in the field. With this Goal, you can situate your research and establish your scholarly position in the field. Two key writing Strategies can help you achieve this Goal effectively, namely *Problematize Research* and *Present Justification*.

Strategies for Achieving Goal - *Indicate a Niche*

WRITING STRATEGIES FOR PROBLEMATIZE RESEARCH

Problematize Research is a Strategy that is used to explicitly indicate the problematic area of the research territory that motivates your study. It is important that the information highlighted through this Strategy is an accurate representation of the research territory and that your research aims directly address your claims in red. You can problematize the research in your established territory using several sub-strategies:

- **indicate a gap** in the targeted research or domain of practice;
- **highlight a concern** that is theoretical, methodological, empirical, or practical;
- **raise general questions** that are lingering in the research; and
- **pose general hypotheses** that lack empirical evidence.

The last two sub-strategies are not the actual research questions and hypotheses that are specific to the study. Rather, they indicate general reflections about the field that trigger your audiences' attention. To understand this distinction between general and study-specific questions/hypotheses, let's take a look at the Language Use for fulfilling the bigger Goal of *Indicate a Niche* in Introductions.

The first sub-strategy is to **indicate a gap** in research. This sub-strategy is specific to knowledge gaps in the existing research space, also known as the targeted research or domain of practice. Let us look at an example:

a. "We could find **no empirical work** on how native language abilities influence scholarly writing skills."

In this sentence, the bolded words can help explicitly indicate a gap. Note that the authors make a strong claim by stating "no empirical work." The strong language would be appropriate to use if authors are 100% certain about their claims. Otherwise, this level of certainty is easy to refute and can be the grounds for immediate criticism if not an accurate representation of the existing research.

The second sub-strategy is to **highlight a concern** that is theoretical, methodological, empirically, or even practical. The concern is usually inferred from established theory or previous research, but it can be built from practical experiences as well.

When the concerns are practical in nature, it is important to support claims about the practical concerns with literature that also suggests the concern is worthy of research. For example, practical concerns in industry or in the classroom may be context specific. An argument needs to be made that the concern goes beyond a specific-context and is relevant to a broader target audience.

Here is an example of Language Use to highlight a concern:

b. "**The literature on** scientific writing, **however, provides little guidance** on how technology facilitates the writing process."

In this sentence, "*little guidance*" is a clear indicator of a problem, but

notice the word "however." *However* is a very strong transition word that typically introduces something negative. Because this word is so useful, it can be overused. Since there are many ways to express a concern, try your best to only use *however* just once in your entire Introduction section to reduce repetition and redundancy.

The next sub-strategies are to **raise general questions** and **pose general hypotheses** that are used to ask questions that draw audiences' attention to general issues or to possible future findings, or potential implications that arise from current knowledge. Hence, they do not represent your research specific questions or hypotheses and are merely general lingering questions or hypotheses that have not yet been addressed or that lack empirical evidence. Here is an example of a general (rhetorical) question embedded within a sentence:

c. "**A key question is whether** trade-off effects, common in the literature, will be found when looking at individual performances."

By saying "**A key question**," the reader's interest and attention may be slightly more elevated.

Now, here is an example of a general hypothesis.

d. "**It is possible that** differences found between university students are confounded by socioeconomic status (SES)."

This example introduces a tentative foundation for possible research, implying that insufficient evidence exists to support topic-related claims. To communicate general hypotheses, it is very common to use modal verbs. **Modal verbs** are verbs such as: *should, would, could, can, may, might, shall, will,* and *must*. These verbs tend to modify the level of certainty by which you express your hypothesis. They are used to show if your hypothesis is certain, probable, or possible (or not). Hence, your degree of certainty would impact the modal verb you choose.

Below are some more Language Use patterns that are used to *Problematize Research*.

Indicate a gap:

- … does not reflect…
- However, … appears to be limited by…
- The undesired differences…
- …this hypothesis mainly rests on …
- No effect of …, and inconsistent effects of…
- However, … no work has been reported on…
- Very few studies investigated the…
- Little information is available…
- Less is known about…
- …has been neglected…
- …do not include…
- Little is known about…

Raise general questions:

- …raise the question of how…
- In other words, how…?
- Given the…, why…?
- Do … really know … well enough …?
- How might the relationship between … and … ?
- Assuming … , what could be .. ?

Pose general hypotheses:

- …is expected that…

- …is likely to…
- …could…
- …may…
- …might…
- …may be more likely to…
- …could be necessary because…

Strategies of Indicate a Niche are often used together to segue into the present research. Using more than one sub-strategy to problematize research will offer stronger argumentation. For example, a gap in knowledge doesn't mean anyone wants to fill that gap, but if a gap is coupled with a methodological concern, all of the sudden the problem within the research territory is more profound. Researchers often combine strategies in the BLUE with those in the RED to strengthen argumentation. For example, if a topic is central to the field (Claim Centrality) but there is a significant practical concern (Problematize Research), these Strategies used together can offer a nice segue into your research topic.

WRITING STRATEGIES FOR PRESENT JUSTIFICATION

Present Justification is an excellent means of segueing into your specific study. This strategy is used to further emphasize a call for action by suggesting that the gap, problem, question, or hypothesis needs to be addressed. This Strategy is also effective for substantiating the importance of action and raising awareness of the potential benefits of taking action.

Let's look at an example where a justification is presented to emphasize or rationalize a call for action that stems from the indicated niche.

a. "**Because** writing **is key to** many learners' success at the university level, **a better understanding of** writing development for this population **is highly relevant**."

Please note that the example above starts with **because** as a way to rationalize what comes next in the sentence: "**a better understanding of…is highly relevant**." In this example, since the author has made the justification for why research is needed, they can move on to provide more specific details about their research. Here is another example:

b. "Given these gaps in the previous research, **there is clearly a need for** more fine-grained analyses of writing improvement."

This example shows how one sentence can address multiple Goals by first re-indicating the gap to connect the research justification, making for strong cohesion between ideas. The sentence also includes the phrase "**there is clearly a need for**" suggesting an indisputable argument for why the present study is necessary. Here, we can better understand the importance of transitions.

Transitions help to connect ideas. In some cases, they may be just one word. For example, ***thus*** and ***therefore***, are used regularly when presenting a justification whereas ***however*** is often used when indicating a gap or highlighting a problem. Transitions can also be a whole introductory phrase, like in the previous example "**Given the gaps in the previous research.**" This style of transition is what we call **old and new information.** Every sentence contains at least one idea. Once you read a sentence, that idea is then "old" information. You can use the old information to segue into new information that comes in a proceeding sentence or clause. In example b, the new information is the justification as reflected in "**there is clearly a need for**." This is also the most important information in the sentence, thus it is in the main clause of the sentence.

If you have multiple claims and subclaims to set up your central research argument, you may see multiple cycles of BLUE and RED. The order of ideas across these cycles should have a clear organizational structure. For example, you might organize your claims in terms of hierarchy in importance or chronology. You may also consider the general-to-specific organization presented earlier. The structure you choose in the Introduction should represent the organizational structure in a separate Literature Review (if this section is typical in your field).

We will return to transitions and cycles of argumentation later in this book. For now, here are some more examples of Language Use for *Present Justification*.

Present Justification

- …is hence needed…
- Therefore,…is needed to…
- …are necessary…
- It is important to…
- To evaluate…, …should be described
- …becomes necessary to…

SUMMARY: INDICATE A NICHE

Let us recap the Goal of **Indicate a Niche**:

1. Remember that the Goal of *Indicate a Niche* is to communicate limitations or incompleteness in the current state-of-the-art. This Goal is very effective for helping express your voice by arguing that there is a need for action in the field.
2. Although it is common to present the Goal of *Establishing the Territory* BEFORE *Indicate a Niche*, in some cases, you may want to jump right into the heart of the argument by starting with Language Use to *Indicate a Niche.* This is especially common when the problem is well-known across multiple disciplines or a general audience.
3. Some research mentors suggest including the RED of your argument no later than the 2nd or 3rd sentence in your Introduction. This style is especially true for grant writing. Again, the choice is dependent on your discipline and your own writing preference.
4. The Strategies to achieve the Goal of *Indicating a Niche* include *Problematize Research* and *Present Justification*. *Problematize Research* also includes sub-strategies of *indicating a gap, highlighting a problem, raising general questions,* and *posing general hypotheses*.
5. Language Use should be explicit for the reader. You do not want your reader to guess or make inferences about what you mean.

WRITING STRATEGIES FOR ADDRESSING THE NICHE

As was discussed previously, the GREEN color stands for how you address the concerns in the field. Green means go and grow! In other words, the Goal here is to contribute to the existing literature and help develop the knowledge in your field. This goal is achieved by previewing what is to come in your research article and by highlighting essential elements of the study. There are four key writing Strategies that are often used to *Address the Niche*; namely *Announce the Purpose, Highlight Study Specifics, State the Value of Research,* and *Outline the Structure*. None of these strategies are obligatory, but using a combination of several strategies can strengthen your communicative intent in this stage of the Introduction.

Strategies for Achieving Goal - *Address the Niche*

WRITING STRATEGIES FOR ANNOUNCE PURPOSE

Announce Purpose is where you introduce the intent of the study along with some of its main features such as methodological design. Here, you can acquaint the reader with the gist of the study by focusing on the study description, as in **this study examines/presents/reports**. We can also inform the reader of the scientific intent, focusing on the purpose statement, such as **the aim/purpose/objective is to examine/present/report.**

The Strategy of *Announcing the Purpose* introduces your research descriptively or purposefully to your audience. If it is important to you to communicate the gist of your study, you may be more descriptive of what your research is about. Here is an example where *Announce the Purpose* is used to describe the gist of research:

- "**The present study** examined test-takers' feedback by conducting and analyzing individual interviews that probed the participants' perceptions, reactions, attitudes, and processes."

This purpose statement summarizes the gist of the study nicely. Notice that the past tense "**examined**" is used in the example. Past tense is common in this strategy because the study was already conducted. Oftentimes, writers use the present (e.g., This study examines…) or future tense (This study will introduce…) to reflect what the study is about or what the study will demonstrate in later sections. The key would be to remain consistent in verb tense usage when you *Address the Niche*.

If you choose to introduce your research purposefully, you need to use a true purpose statement. The key characteristic of this strategy is the use of **infinitive verbs**. Take a look at the following example:

- "**The main purpose of this study is to gain** a better understanding of the difficult effects of research writing training on graduate students' writing development."

In this example, the researcher's intent is explicit due to the use of direct pointers such as "**the main purpose**" and the infinitive verb "**to gain**."

In what follows, we present some common language use patterns that can be used to announce research both descriptively and purposefully:

Announce purpose descriptively:

- This research will focus on…
- A comparison of… is presented…
- …will illustrate how…
- This research concentrates on how…
- In the present study…was investigated.

Announce purpose purposefully:

- The aim of the present paper is to…
- The main purpose of the experiment reported here was to…
- The goals of this investigation were to…
- This study was designed to evaluate…

WRITING STRATEGIES FOR HIGHLIGHT STUDY SPECIFICS

Highlight Study Specifics can be achieved by bringing in specifics from your Methods and Results. Essentially, any information that you might see in the Methods or Results section that is relevant to your research contributions can be fronted in this stage of the Introduction. What to include here largely depends on your take-home messages, or the central messages you hope to communicate to your reader about your research. This strategy is realized using four main sub-strategies:

- **present research questions and/or hypotheses,**
- **clarify definitions,**
- **summarize methods, and**
- **announcing principal outcomes.**

Let's take a look first at the Language Use patterns for **present research questions and hypotheses**. Formulating strong research questions and hypotheses is a very strong sub-strategy that can be used to clarify what specifically you are investigating. If you do not have enough experience formulating questions and hypotheses, you must consult a research mentor to make sure your questions are clear, concise, focused, and arguable.

Although you might see simple yes/no questions in published research articles, these questions should be avoided unless they are truly appropriate for your research. Open-ended questions, or wh-questions such as the ones that start with **what, why,** and **how** are often more useful research questions to pose. Ultimately, the type of questions depends on the nature of your research.

Research questions are often written as direct questions, but they can also be presented in rhetorical statements such as in the following example:

a. *"**In the work presented here,** **we investigate whether** the precision of the A contributes to the development of B."*

The question in example **a** is similar to the general rhetorical questions that you might pose as a sub-strategy in Goal – *Indicate a Niche* and Strategy – *Problematize Research*. However, the difference is that the question in this example is a specific and arguable question that is awaiting specific answers via the present study. *Hypotheses* on the other hand are statements to introduce the assumptions to be tested or speculations about potential outcomes of the study.

The next sub-strategy is to **clarify definitions**. It is essential that you clearly define key terms or constructs at some point in your study if these definitions represent a unique epistemological lens through which your study is conducted. Definitions of constructs are also important if they are divergent from those in other fields or from different theoretical perspectives. Clarifying definitions,

also known as operationalizing constructs, is especially important when you are measuring variables that are defined differently across studies, are a bit arbitrary, are not directly observable, or may even be quite complex for your audience to understand. By clarifying your definitions, you can avoid misinterpretations of your work due to unfamiliar terminology. This sub-strategy also helps increase the quality of the results and improve the robustness of your research design.

Terminology in your study may be **general concepts** or **measurable constructs.** For *general concepts*, you may provide a conceptual definition that provides meaning but is still abstract or theoretical. *Measurable constructs*, on the other hand, are the ones that you intend to investigate in your study. These need to be operationalized so that the definition is clear and the procedures used to measure the construct become concrete. Here is an example:

b. "**The conceptual definition** of Development is—the process of growing"

The definition in this example is vague and unmeasurable, hence can be transferred to multiple contexts. This type of definition can be used as long as the author does not intend to measure "development" as a construct.

To strengthen your operational definition, it is important to review the relevant literature with the aim of (1) finding how other research defines the same construct, (2) accurately capturing the intended construct (3) improving the validity of your research, and (4) strengthening your rationale for choosing the definition that you choose.

Another common sub-strategy is to **summarize methods**. This sub-strategy is most typically used when there is a methodological contribution or if the methods are unique to your study. You may also want to *summarize methods* to simply preview what will come next in your research. *Summarizing methods* in the Introduction may also help to begin establishing the credibility of your study, which will help to answer some questions the readers may have about your take-home messages, your overall arguments, or your principal results.

The next sub-strategy that you can use to introduce study specifics is to **announce principal outcomes**. This strategy is quite common in many disciplines, but it is not obligatory. A common reason for announcing outcomes in the Introduction is to transition into the value of your study or to preview a more detailed presentation of the results.

The Language Use patterns that you can use to *highlight study specifics* will be discussed in later chapters when Methods and Results are presented. However, we encourage you to analyze some sample articles from your field and in your research topic to discover the Language Use patterns. You may notice that these strategies are either extensively used, briefly described, or non-existent.

WRITING STRATEGIES FOR STATE VALUE OF PRESENT RESEARCH

When the Goal is to *Address the Niche*, one of the most effective strategies to communicate the importance of your work is to *State the Value of the Present Research*. This strategy is used to express the main essence of your entire study; the answer to the "so what?" question. As researchers, your desire should be to move the field forward, so it should be important to make a statement as to how exactly your work accomplishes this. It is common for novice research writers to make their value statement implicit, requiring readers to read in-between the lines. You must avoid this, as it is crucial to be direct, as long as your contribution statement is justified. Hence, stating the value or contribution of research should be done very explicitly.

Here are a few examples of Language Use patterns for State the Value of the Present Research. Please read through the following examples carefully.

a. "**This paper contributes to this burgeoning research area by** outlining how corpus linguistics tools and methods can be usefully applied to studies of language ideology."

b. "**The study extends previous research by** using multiple measures to assess writing development and by comparing the impact of different settings."

c. "**Our study deepens** these calls for more mode-balanced agendas."

Notice the explicit language and the use of present tense verbs **contributes, extends, deepens**. Below are a few more examples of this sub-strategy, and we will see more as we introduce Strategies in the Discussion/Conclusion.

State Value of Present Research

- The results of this basic investigation can help to…
- This paper extends and deepens this growing international accounting literature by…
- This study provides valuable insights into…

WRITING STRATEGIES FOR OUTLINE STRUCTURE

The final strategy that you may use in the Introduction is *Outline the Structure of the Research*. This strategy is used in some disciplines more than others and is more prevalent in long dissertations or theses than journal articles. The reason to *outline the structure* is to guide the reader through the argument and inform the reader of the organization of the proceeding content. This strategy is very effective when your paper is dense, or if you want to be sure your reader understands the logic behind your research organization. By including an outline, or roadmap into the rest of the text, you can also establish cohesion in your paper as a whole.

Below are some Language Use patterns that may appear in research articles as well as longer manuscripts.

Outline the Structure

- This paper is structured as follows …
- The remainder of this research is divided into five sections.
- Section 1 describes …
- Section 2 provides an account of …
- Section 3 concludes with …

Language Use patterns can be used in two ways: (1) as a springboard for forming your sentence structures that communicate a specific meaning or (2) as a placeholder to allow you to continue writing without cognitive overload. When you include language that expresses an idea from someone else's research, you MUST cite their work to avoid plagiarism.

SUMMARY: ADDRESS THE NICHE

Let us recap the Goal of *Addressing the Niche*:

1. *Address the Niche* is represented metaphorically using the color GREEN, which represents growth or continuation. This Goal is used to communicate how your research will contribute to existing literature and/or address concerns in the field. This Goal is very effective for helping preview your research by highlighting essential elements of your study.
2. Although it is common to see details of your study at the very end of the Introduction section, the GREEN may be discussed in a cyclical pattern if the study has more than one argument. That is, If you have multiple arguments to set up your research, you may see multiple cycles of BLUE-RED-GREEN or variations thereof.
3. The language you use should still be explicit for the reader to prevent guessing or making inferences about your communicative intent.
4. There are four key writing strategies that are often used to realize this Goal. These strategies are not obligatory, but by using a combination of several strategies, you can strengthen your communication.

    - *Announce Purpose* is used to introduce the main features of the study, focusing on the general study description and/or the purpose statement.
    - *Highlight Study Specifics* can be achieved in many ways like:
        - *presenting research questions* and *research hypotheses* to introduce points of emphasis in the study or main concepts to be tested,
        - *clarifying definitions* to provide the direct meaning of terminology or constructs, and
        - *summarizing methods* and *announcing principal outcomes* to point out key details of the study to preview what's going on later in the paper.
    - *State Contributions* emphasize the importance or value of the study.
    - *Outline the Structure* guides the reader through the content of the paper.

ACTIVITY: CORPUS EXPLORATION

For each section of the research article, you will be completing a corpus exploration task. Again, you can complete this task manually with your corpus of articles, or in Dissemity. You can submit Language Use patterns to Dissemity's TOOLBOX in the top right corner of Dissemity. You are going to focus on the EXPLORE module for this task, but the previous corpus annotation task may also be useful.

The objective of this task is to:

- discover how language helps to create meaning,
- explore explicit Language Use patterns that can make your communicative intent salient;
- help you form a language toolbox with patterns that can help you overcome writer's block.

Here are the steps for completing the task in Dissemity:

Step 1. Revisit the Model Article Annotation Activity and continue to explore your corpus of articles from the "Choose a Model Article and Compile a Corpus" activity. Search closely for Language Use patterns that help researchers communicate Goals and Strategies.

Step 2. Go to Dissemity and watch the EXPLORE module tutorial for help.

Step 3. Go to the **EXPLORE** tab and search for some of the language patterns that you found in your model articles. For example, if you noticed the pattern heightened interest in your model to help *Claim Centrality*, you might search for "interest" in the **EXPLORE** module to see if additional patterns emerge.

Note: You should really shy away from using Language Use patterns from articles that you consider to be models because you want your writing to be distinct. You want to find your own voice and not mimic someone else's voice. Therefore, the next step is critical for discovering a range of language use patterns to help you express a similar communicative intent as the researchers in your model articles.

Step 4. Record your findings in Dissemity's TOOLBOX (found in the top right corner). You should find a minimum of three (3) templates per writing Strategy (e.g., three from *Claim Centrality*, three from *Provide Background*). If you cannot find any, that may be because your discipline does not use that strategy often. Just take note of this discipline-specific variation by adding a pattern that says "Not found in my discipline" rather than adding a language template.

Note: We are not looking for full sentences. We are looking for Language Use patterns that are not discipline specific and can be used across all disciplines. For example, we are looking for #1 below but not #2.

1. have been of increased **interest in** (YES)
2. These subcomponents of language performance have been of increased **interest in second language** development. (NO)

ACTIVITY: MODEL ARTICLE ANNOTATION

For each section of the research article, you will be completing a model article annotation task. This task can be done using results from your Choose a Model Article and Compile a Corpus from chapter one. You can choose to complete the task using a web-based software called Dissemity that contains a set of tools and automated feedback for analyzing research and later writing your work. The steps below will take you through the completion of this task by using Dissemity, but this task can be completed using any annotation or highlighting tools.

The objective of this task is to:

- help you analyze your model article for Goals, Strategies, and Language Use,
- visualize the argument structure of a good example piece of writing,
- practice being a critical reader to inform your writing process, and
- identify Language Use patterns.

Here are the steps for completing this task:

Step 1. Go to https://dissemity.com/ and create an account to get started. Watch the video introduction for help.

Step 2. Upon login, go to the **ANALYZE** module.

Step 3. Paste your model article from your Choose a Model Article and Compile a Corpus activity. If you copy and paste from a PDF, the formatting will need to be cleaned up in Dissemity. Just make sure there are no line breaks in the middle of a sentence by editing the file after pasting.

Step 5. Click on the first sentence and then use the dropdown menu to determine what Goal and Strategy are utilized. Remember that one sentence may accomplish multiple Goals and/or Strategies, but you should choose the most prominent one. Alternatively, you can use highlights or a technology that allows you to highlight sentences (e.g., a PDF viewer) in different colors.

Step 6. Annotate the Introduction section based on what you have learned thus far. Your progress will save automatically in Dissemity. You can continue to annotate other articles in your corpus for additional practice and understanding of writing in your field. This is highly encouraged!

Step 7. Reflect on the following questions:

- Which Goals and Strategies seem to be most common in your field?
- Which Goals and Strategies seem to be least common, or nonexistent, in your field?
- What is the researcher trying to communicate through each Goal and Strategy?
- What have you learned from completing this task?

CHAPTER III

CHAPTER THREE: METHODS SECTIONS

The Methods section is your plan of action for the research study you are conducting. To write the Methods section, you need to record very important details from your study procedures, and those details can help you conceptualize your Methods section more clearly. In this chapter, we will discuss the purpose and the formatting of the Methods section, followed by writing strategies to achieve the goals within Methods sections. But first, let us think about the following questions:

- *Why do you think Methods are important?*
- *What kind of information do you expect to see when you read Methods?*
- *What do you think may make Methods ineffective?*

The Purpose

Remember that it is not just the Introduction section that is a written argument. Your entire manuscript should be viewed as one large argument, and all its sections must be persuasive in order to convey the value of your work. For Methods, **the central argument** is that your actions are rigorous and trustworthy. You can establish this argumentation by describing your work so that it can be replicated or transferred to other research contexts. This replicability requires a detailed description of approaches used to collect and/or analyze your data and the steps taken to conduct the study or experiment. Your argumentation should also include references to external research that helps support or justify your decisions. This referencing is one important way to achieve readers' trust in your decisions. Overall, by demonstrating transparency in your methodological choices, you can establish credibility for the study results and overall contributions.

When making methodological choices, consider erring on the conservative side and including all details of your study. Leave it up to the editors, reviewers, or research mentors to decide if your methods contain unnecessary detail. If you are using human or animal subjects, details may include statements that your experiment was conducted according to **accepted norms and standards** in your field. Clarifying that you have obtained informed consent or that you have followed guidelines from your discipline are particularly important.

If your study contributions are largely methodological, you will need to emphasize throughout your manuscript that your methods bring new knowledge to the field. You can do this by problematizing the research in the Introduction as a way to emphasize the methodological problems, gaps, general questions or hypotheses. You may choose to reemphasize those methodological concerns in the Methods section.

Establishing credibility and building trust does not mean that **limitations** should be disguised. Actions taken in your study should be detailed enough that all potential limitations impacting your results are addressed. Hiding elements of your design, perhaps due to a limitation, is considered unethical. Limitations are normal and at times unavoidable. Therefore, the best way to approach limitations should be to clearly state what the limitations are while briefly rationalizing why they occurred. It is common to give a gentle acknowledgement of weaknesses, problems, or shortcomings of research in Methods because the Discussion section will allow for broader discussion of limitations.

The Format

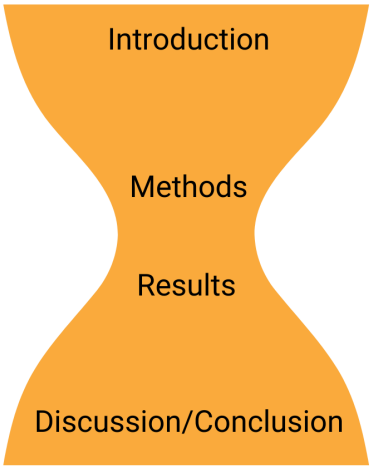
Before discussing the overall format of the Methods section, choose a model article within your area of interest. A model article should represent strong research writing and ideally reflect a similar methodology as the manuscript you are currently writing. Once you have chosen that model Methods section, answer the following questions:

- *Where is the Methods section located?*
- *How are the Methods sections and subsections named?*
- *How is the Methods section organized?*
- *What is the length of the Methods section?*

It is best to extend this analysis to all the articles in your Choose a Model Article and Compile a Corpus activity from Chapter One. In this way, you can get a general idea of patterns in your field rather than relying on knowledge from a single article.

Now that you have a general idea of what Methods include in your field, let us go back to the hourglass figure. The Methods section is usually right at the center of the hour glass where all the information is narrow and specific to **your** study. This part in the argument is where you justify your actions in your research.

If your Methods section is aimed at a multidisciplinary audience, is new or controversial, or is essentially a "Methods" paper, your section will likely be more detailed and extended. Otherwise, you may write a more succinct section, like in the fields of chemistry, material science, and molecular biology.



Format of Methods Resembles the Middle of an Hourglass

GOALS, STRATEGIES, AND LANGUAGE USE IN METHODS

As a reminder, there are different tools for each section of the research article, and all these tools can be categorized into three sets: **Goals, Strategies,** and **Language Use**. *Goals* are used to communicate your overall argumentative intent. *Strategies* are used to achieve your goals, and *Language Use* connects the goals and strategies in meaningful ways to enable explicit and cohesive expression of ideas.

1. *There are **three** overarching Goals of a Methods section. What do you think they are?*
2. *What common Language Use expressions (e.g., Data were collected...) have you used in Methods? What do those expressions intend to communicate?*

Writing Strategies for Communicating Goals in Methods

In the next sections, you will learn about the **EIGHT** Strategies that will help you achieve the three Goals of Methods. These Strategies will be useful for (1) analyzing model articles by visualizing how published authors achieve their communicative goals and (2) facilitating your writing process by helping you utilize similar strategies while maintaining your individual style and identity as a researcher. In this section, we will also provide examples of the Language Use for realizing each of the strategies.

Overview of Goals and Strategies for Methods

Communicative Goals in Methods

Remember that *Goals* are used as tools to help you realize your overall communicative intent. In research writing, our intent in the Methods section is to justify your plan of action. You can justify your plan of action using **three** main Goals. **Contextualize the Methods**, or setting the scene, includes all details, decisions, and rationales that occur prior to the study. This Goal may include information

about the research design, participants/subjects, or setting. This Goal is not obligatory in all fields. **Describe the Study** is often the most extensive Goal. It is used to outline details, decisions, and rationales specific to the step-by-step procedures to obtain raw data. **Analyze the Data** enables writers to discuss how the raw data is translated into eloquent, credible results that answer precise research questions and/or hypotheses.

Goal One: Contextualize the Methods

In *Contextualize the Methods*, the intent is to foreground details of your study that help clarify actions taken later in the step-by-step procedures, or study actions. For example, if you are working with human participants, their demographic details and the rationale for including or excluding certain participants are important to know before segueing into the procedures involving those participants. Another example is agricultural research, such as crop sciences. Before detailing how crops were grown and maintained, we need to understand contextual factors such as climate and location so that results can be interpreted appropriately and generalized to similar contexts. Think of this Goal as **setting the scene** of the study by providing details of the overall study description and necessary background information for the research approach. Essentially, you can include any information that is needed prior to delineating how the study was actually conducted step-by-step.

Goal Two: Describe the Study

The second goal is *Describe the Study*. Here, you need to specify the process of data acquisition and define data descriptors. Describing what resources and tools were used and what steps were taken to collect and/or prepare your data comprise a big part of this Goal. Also, you must clarify conditions, treatments, controls, etc. This Goal is oftentimes the most extensive, and some disciplines start Methods sections with this Goal because the contextual information is either embedded in the procedures or is not relevant, as is the case in computational research.

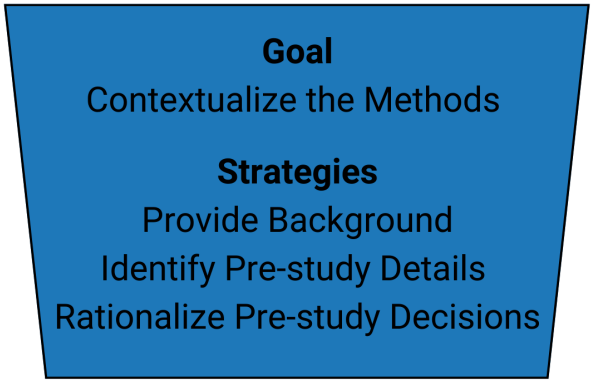
Goal Three: Analyze the Data

Once raw data is obtained, there is often a step to transforming that data to eloquent, credible results in response to research questions and/or hypotheses. This Goal is *Analyze the Data* and is used to inform readers of any steps, tools, or techniques used to prepare the data for analysis and then to conduct the actual qualitative and/or quantitative analysis. These details and decisions should include rationales that establish the Results as credible and trustworthy.

It is important to know that you may not use all the tools including the communicative Goals and Strategies introduced here. Your choice of tools depends on the nature of your research. Accordingly, some strategies might be more extensive than others and some may not be used at all. You will see which ones are frequently used by analyzing sample articles in your discipline.

WRITING STRATEGIES FOR CONTEXTUALIZE THE METHODS

Let us preview the Strategies for *Contextualize the Methods*. In this Goal, you need to provide any general information in the field or about the study that the reader must know to understand the step-by-step procedures of the study. These details set the scene for more details in the Goals that will follow in Methods. To achieve this Goal, there are **three** main strategies to choose from: **Provide Background, Identify Pre-study Details,** and **Rationalize Pre-study Decisions**.



Strategies for Achieving
Goal - *Contextualize the Methods*

WRITING STRATEGIES FOR PROVIDE BACKGROUND

Provide Background can be used in much the same way as *Provide Background* in the Introduction. You may utilize this Strategy to provide background information relevant to the research territory or to simply overview the section to help the reader navigate the study methods. This Strategy is also used to give theoretical, empirical, or informational background with or without references depending on how general the information might be. To understand this Strategy, let us look at several examples:

a. **The methodological design is based on previous research (Author, YEAR).**

b. **The following section provides information on** the statistical analyses used in this study.

Example **a** was a sentence found at the beginning of a Methods section to illustrate the broader lens from which the research was derived. Example **b** was found just before the final section of a Methods section as a segue into the data analysis.

Referencing past research is particularly important in the Methods section because previous research can support your methodological choices (we will see this again in an upcoming Strategy). You can also provide references to prior work to frame or situate your study within the wider body of knowledge, which is especially important if your research has methodological contributions. You can use references via citations or even footnotes and endnotes, whichever is a common style in your target journal. Some journals prefer that researchers limit the number of additional notes by integrating the content directly into the text.

Take a look at a few Language Use examples for this Strategy and note the similarity to what we see in the blue sky of the Introduction section.

Referencing previous work

- …as discussed in (Author, YEAR)
- …following the work of Author (YEAR)
- Author (YEAR) utilized ….
- The methodology chosen here is based on…. (Author, YEAR)
- …has been described in detail elsewhere (Author, YEAR)

Providing general information

- Since …, …has received an increasing amount of attention
- This section provides background on …
- …is widely used…
- …are typical of…
- Generally, …
- It is well known that…

WRITING STRATEGIES FOR IDENTIFY PRE-STUDY DECISIONS

Identify Pre-study Details includes nearly any information that the reader needs to know prior to the actual step-by-step procedures of acquiring the data, implementing a study design, or analyzing the data. You can identify details prior to the study description by using several sub-strategies:

- **identify methodological approach or design**
- **describe the setting, and/or**
- **introducing subjects/participants**

Let us start with *identifying the methodological approach or design*. There exist many research designs, but all fall roughly into three approaches: quantitative, qualitative, and mixed-methods. Within these approaches, you may follow a specific design or choose a cross-disciplinary approach. For example, you may take a cross-sectional, repeated cross-sectional, or longitudinal design to describe when data are collected. Also, you may have heard of independent measures, repeated measures, and matched pairs for describing how participants/subjects are allocated to different groups. In many life science, physical science, and social science disciplines, you may want to consider the number of treatments, a full description of how the treatments were arranged, and the number of replications or observations. For qualitative research, you may want to consider sharing your epistemological stance and theoretical foundation.

If it is a common practice in your discipline to state the methodological approach used in research articles, then you may locate this type of information either near the beginning of sample articles' Methods section or at the beginning of its Data Analysis section. Here are two examples:

a. **This study is based in a quasi-experimental design**, which was carried out in two stages over 11 weeks.

b. **A mixed methodology was adopted** for data collection and analysis.

In both examples, there are limited details about the design. In Example **a**, indication that the study is "**quasi-experimental**" is often sufficient for a reader. However, Example **b** would often be followed by more information about the mixed methodology such as whether the mixing of methods happens during data collection, analysis, or interpretation should also be considered.

If you do not know much about methodological approaches and experimental designs, you are encouraged to consult with your research mentor. There is often a discipline-specific research methods course or materials that go beyond the scope of this book to help you.

Describing the setting is a sub-strategy used to present the characteristics of the environment in which the study was conducted (including place, temperature, time of the year, etc). These details help the reader situate the study in time and/or space and also help greatly in ensuring the replicability of the Methods. Readers want to gain just enough information that they can easily infer how the results may transfer or be generalized to their context. For example, if you are conducting agricultural research, readers want to know if similar findings may be observed in the research conducted in their own unique setting. To do so, they will need information about the climate. If you are working in educational settings, the classroom environment including access to resources, size of the school and classroom, and perhaps even the layout of the classrooms may be necessary to describe. Here is an example of describing the setting:

c. The study took place at a public research university, located in south central United States.

Example **c** illustrates how the local context of the public university is not explicitly named, but details are sufficient for relating the context to other similar settings where the study may be replicated.

Introducing the subjects/participants is used to identify and describe original characteristics, properties, origins, number, composition/construction, etc. Details about the process by which they were recruited/selected/obtained may also be included. A common practice is to provide these pre-study details in separate subsections to differentiate this information from the experimental procedure. Research not involving human participants or animal subjects will not likely utilize this Strategy.

Below are some additional Language Use patterns to help you understand the sub-strategies of *Identify Pre-study Details*. Be on the lookout for more as you analyze published work in your field.

Methodological Design

- We use … to run a counterfactual analysis of …
- A [pre-test, post-test, quasi-experimental non-randomized group] design was used to investigate how…
- This [quasi experimental pilot study] employed a [matched-control] design

Research Design

- We use … to run a counterfactual analysis of …
- A [pre-test, post-test, quasi-experimental non-randomized group] design was used to investigate how…
- This [quasi experimental pilot study] employed a [matched-control] design

Setting

- …at manufacturer recommended standard temp
- ..under the same conditions

- …in naturally occurring conditions…
- …at room temperature under sterile conditions
- … at … degrees Celsius
- …at a large research university

Subjects/Participants

- All of our invitees were…
- … were randomly selected …
- Two groups of … participated in the study
- Our sample consisted of…
- To construct the sample, we first identified…

WRITING STRATEGIES FOR RATIONALIZE PRE-STUDY DECISIONS

Rationalize Pre-Study Decisions is perhaps the most important Strategy of Contextualize the Methods. Rationalize Pre-study Decisions is used to justify any methodological choice that leads and guides the main study. Providing information about pre-study decisions will help establish credibility for your research and help your reader trust your results as reliable and valid.

As mentioned earlier in this chapter, the Methods are the part of our scientific argument where we justify our plan of action. So far, we have discussed the methodological approach, design, context, and subjects/participants as main sub-strategies to Contextualize the Methods. Now it is important to think about why decisions were made in regard to those sub-strategies. Rationalizing some of our decisions and choices explicitly can provide clarity to the reader, especially when pre-study decisions are divergent or unique from other studies.

Although the Strategy – Rationalize Study Decisions is important, not all disciplines utilize this Strategy heavily in a manuscript. The choice of whether you need to justify your choices in writing should be based on standards in the field and whether or not you are diverging from what is common practice. Regardless of whether you decide to explicitly note your justifications in writing, you should always know why decisions were made so that you remain an informed, credible researcher of your own work.

Instances of rationalizing are likely to appear in each Goal presented in the Methods section to support nearly all strategic choices in the Methods. To utilize this strategy, you should ask yourself the question of why you have selected the design, the setting, and the participants that you have. Answers to this overall question help add credibility to your overall research. When asking this question, you should also be aware of the ethical, legal, and regulatory requirements for research on human subjects and for animal experimentation in your own country as well as applicable international countries with which you may collaborate. To Rationalize Pre-study Decisions, you may also refer to previous research, especially if you are replicating a design or utilizing certain stages of another study. However, you must be cautious that just because previous work has conducted a similar study using similar methods does not provide immediate justification for the decisions and choices in your study. For instance, if you are using the

same survey as another study, you still have to rationalize why that survey is also relevant to your context of study. Please read the following sentence:

a. Following Author's (YEAR) recommendations on confirmatory hypothesis testing, **we chose** a multilevel model reflecting our main research question.

In this sentence, the introductory phrase, "Following Author's (YEAR) recommendations on confirmatory hypothesis testing…," is used to justify the choice of a multilevel model, which describes the experimental design. While the previous example is only a phrase within a sentence, you may see this strategy take on the whole sentence. Take the following sentences as examples:

b. We chose our study design for a number of reasons.

c. A convenience sample was used to pilot the study design and gather basic data and trends regarding the study.

Here are more Language Use examples of Rationalize Pre-study Decisions:

- …with informed consent, as required by…
- All experiments were executed in accordance with the guide for …
- …study was approved by…
- …experiments were performed with approval from…
- …was deemed important since…
- …allows for more detailed accounts of…

SUMMARY: CONTEXTUALIZE METHODS

Let us recap the Goal – *Contextualize the Methods*:

Remember that *Contextualize the Methods* is used to provide information on the context of the study. The content may include any general information in the field or about the study that the reader needs to know to understand the step-by-step procedures of the study. These details set the scene for the study.

1. To achieve this Goal, there are **three** main Strategies: *Provide Background, Identify Pre-study Details,* and *Rationalize Pre-study Decisions.*
2. We know that *Provide Background* helps to orient the reader to the specifics of the study and link information in the field to the reported study. Referencing is also great for supporting methodological decisions.
3. *Identify Pre-study Details* may include description of the methodological approach (or experimental design), the setting, and/or the subjects/participants
4. *Rationalize Pre-study Decisions* is where we justify any methodological choices leading up to the main study. This will help establish credibility of your work.
5. Like stated before, you are not obligated to use all of these strategies, but you will see which are frequently used by analyzing writing in your discipline.

WRITING STRATEGIES FOR DESCRIBE THE STUDY

Now that we have introduced the Strategies that lead up to the study details, we need to discuss the Strategies that are used to *Describe the Study* in depth. Describe the Study contains information about how the data were acquired for the study (including a description of the data), how the experimental procedures were conducted (including a description of variables, tools, instruments, materials, equipment, and preliminary results), and rationales for some or all experimental procedures. There are **three** Strategies that are often used to *Describe the Study*: **Describe Data Acquisition, Delineate Procedures,** and **Rationalize Study Decisions**.

Strategies for Achieving Goal - *Describe the Study*

WRITING STRATEGIES FOR DESCRIBE DATA ACQUISITION

Describe Data Acquisition is a Strategy used to illustrate the process of collecting or recording primary or secondary data and describing those data. We can utilize this strategy to describe how data were obtained, sampled or selected. This strategy can also be used to present methods of data collection and to give a general or detailed description of the acquired data. For instance, we can present certain analysis or recording of different types of data including visual data. Additionally, Describe Data Acquisition helps us elaborate on the characteristics of data, its measurement, units, scales and so on. Considering the nature of data, the abstract qualities of data can also be presented.

One very important writing strategy to consider about describing data acquisition is verb tense. While much of the study choices from the earlier goal of contextualizing the study happen in the past, there is some flexibility in verb usage. In contextualizing the study, some details hold true even after the study, like characteristics of a university setting or participant characteristics. You then have the choice of using present tense or past tense verbs.

When using the Goal – Describe the study, almost all of the choices will have happened in the past, so you will likely consistently refer to the past. To do so, you have the choice of using **active and passive voice**.

Most research mentors will likely tell you that they prefer the active voice throughout the research article because it adds clarity, as in sentences that start with "Research shows…" and "Findings suggest…" Here, the subject of the sentences "Research" and "Findings" do the action. In Methods sections, however, it is less important "who" does the action and more important "what" action was done. We can assume that you and maybe your co-authors are the ones who conducted the study, so the actor is already implied. This is why we often see the passive voice in the Methods section.

Let us take an example of active voice sentence:

a. **The researcher** collected data from 921 graduate student writers.

Here, the actor is **the researcher**, but since we can already assume that the researcher is the one who collected the data, we can eliminate the subject and move the receiver of the action to the subject position. Now, we can see:

b. "Data _____ collected from 921 graduate student writers."

This instance is where the past tense is needed. You should now insert the "be" verb in the past tense to signify that the action is now complete:

c. "Data **was** collected from 921 graduate student writers."

I want to stress again that the passive voice is only common in the Methods section and when talking about actions you completed in the past. Otherwise, you should push yourself to use an active voice. Other verbs that are common in acquiring the data include: collected, sampled, measured, scored, recorded, calculated. Here is another example:

d. "A total of eight classes were sampled in the Spring of 2012."

Now, let us look at some language use patterns. One very important writing tip to consider about *Describe Data Acquisition* is verb tense. In the Goal – *Describe the Study*, almost all of the choices will have happened in the past, so you should consistently utilize past tense verbs. To do so, you have the choice of using what we call active and passive voice. Most research mentors prefer the active voice throughout other sections of the research article because active tense can add clarity and concision. Take the following Language Use patterns from Introduction sections as examples: "Research shows…" and "Findings suggest…." In these patterns what is important to note is that "Research" and "Findings" provide evidence to support a claim. Thus, these agents are important.

In Methods sections, however, it is less important "who" is the agent and more important "what" action was done. We can assume that you and maybe your co-authors are the ones who conducted the study, so the agent is already implied. That is, the agent is the researcher(s). Because the agent is known, the passive voice is commonly used in the Methods section to place importance on the action. Take a look at the following example of an active voice sentence:

e. The researcher collected data from 921 graduate student writers.

Here, the actor is the researcher, but since we can already assume that the researcher is the one who collected the data, we can eliminate the subject and move the receiver of the action to the subject position. Now, we can see:

f. Data _____ collected from 921 graduate student writers.

This is where the past tense is needed. You should now insert the "be" verb in the past tense to signify that the action is now complete:

g. Data were collected from 921 graduate student writers.

The passive use of were collected is quite common in Methods. Other verbs that are common in acquiring the data include: sampled, measured, scored, recorded, calculated.

The passive voice is only common in the Methods section, when referring to Methods sections, and when talking about actions completed in the past. Otherwise, active voice is often the best option.

Now, let us look at some Language Use patterns for *Describe Data Acquisition*:

- Data were collected…
- …were measured/scored
- …were calculated/recorded

WRITING STRATEGIES FOR DELINEATE PROCEDURES

The next Strategy is *Delineate Procedures*. This Strategy is used to outline and describe what was done or used for the actual study/experiment in step-by-step actions. *Delineate Procedures* contains several sub-strategies:

- **outline step-by-step actions**
- **describe variables** used or manipulated,
- **introduce physical or abstract tools** (e.g., instruments, materials, equipment) used during experimentation, and
- **report incremental outcomes** of preliminary measurements or of qualitative observations.

Outlining step-by-step actions is likely the most extensive sub-strategy utilized to achieve the Goal – *Describe the Study*. This sub-strategy is integral to replication. By providing sufficient description for future replication of the study, future research should be able to repeat your design, get similar findings, and then build upon your work. If you have lengthy details that are important for replication, you may want to consider placing these details in an **appendix**. These may include detailed calculations, algorithms, proofs, tables, plots, and images or large data sets for meta-analyses and comparisons.

Not all studies include variables, but those that do should **describe variables** fully in relation to previous research. If multiple variables are involved in your design, you can organize your Methods by separating each variable into one or more paragraphs or subsections, usually sequenced in chronological order, or from most to least important. You may decide to transfer the same organization of your variables into the Results chapter. This is especially common in social science disciplines, so examine model articles in your target journal to learn more.

Introducing physical or abstract tools is important for discussing details throughout the research process. For lab or field equipment, you may include the origins of the product. If you are working with data collection instruments like questionnaires and interview protocols, you may consider adding an appendix or supplemental information, if your journal allows for such additions. When in doubt, communicate with the journal editor for advice.

For questionnaires and interviews (and similar data collection materials), a general tip is to provide as much description as possible to add to the reliability of the design. You can always cut details later, but do not dismiss these details in the meantime.

On occasion, you will need to **report incremental outcomes**, not main findings, that are needed to progress in the experimental design. You may (1) report on gradual change in the observed phenomenon or (2) provide justifiable sequence of experimental steps. If another researcher is trying to replicate your study design, they may need to reach a certain temperature or obtain a specific percentage or other calculation before proceeding.

Here are some Language Use patterns that might help you *Delineate Procedures*:

Outline step-by-step actions

- Both treatments were incorporated into…
- A series of experiments were conducted …
- …was prepared in …
- …was performed…
- Experiments were carried out

Describe variables

- … X was defined as the dependent variable
- …served as controls.
- As shown in Table 1, these variables are classified into…
- One … served as the treatment group and the other as the contrast group

Introduce physical or abstract tools

- The questionnaire started with the introduction to…
- … using … software.
- … using the following equation …
- With the aid of the …
- … was used

Report incremental outcomes

- The evaluation of… did not differ significantly from…
- This technique resulted in …
- …no increase in…was observed

WRITING STRATEGIES FOR RATIONALIZE STUDY DECISIONS

Rationalize Study Decisions is used to provide reasoning or explanation throughout your main experimental design. We do this to justify experiment/study-related choices and help establish credibility in the study. This Strategy also helps to connect the experiment/study-related choices and the general research purpose/objectives/research questions. Take this sentence as an example:

a. "**Because the current study aimed to** investigate learners' perceptions toward task performance in each unit, **we focused on** only those four survey items that related to this, three of which are Likert scale and one open-ended."

To help you recall, elements of *rationalizing* existed in the previous Goal to rationalize pre-study decisions. *Rationalizing* can occur when you are discussing data collection or preparation as well. If you made a choice in your study, you will likely need to state or at least think about **why** that choice was made.

If you made a choice following standard practice, you will find that it is quite common to reference previous work as a form of justifying. As in this example:

b. "For all samples, activity was calculated and reported **as described by Author (YEAR).**

A word of caution, however. Just because another study utilized the same procedure or made similar choices does not automatically provide a justification for why you also followed the same practice.

Now, let's look at another example:

c. "Cognitive abilities were assessed with the Cognitive Abilities Test by Heller and Perleth (2000), **as it allows for an estimate of** students' general cognitive abilities independent of their language proficiency."

We can see from Example **c**, the rationalizing statement is only part of the final clause, starting with "as it allows for an estimate of…". This clause is used because the author needs to rationalize why the Cognitive Abilities Test was used (assuming there are other ways of assessing cognition).

Sometimes, we not only have to justify what we did do, but also what we did not do. Take the following example:

d. "English word reading performance was also assessed at age 5 **but was excluded from this study because** the word list used was different from the one used in subsequent years."

Here are some additional Language Use examples:

- Because the broader study involved…, it is possible that…
- … is only valid for …
- All procedures involving …. were approved by

SUMMARY: DESCRIBE THE STUDY

Let us recap the goal *Describing the Study* or *Providing Details*. Remember that the goal of *Describing the Study* is to communicate how the data were acquired for the study, including a description of the data and any variables that may or may not be considered. This goal also contains experimental procedures and tools/instruments/materials/equipment as well as rationales for some or all experimental procedures, and brief statements of preliminary results may be provided as well.

There are three key writing Strategies that are used to *Describe the Study*. *Describe Data Acquisition* is utilized to present the process of collecting/recording and describing the data. Data can be described using quantitative features (e.g. measures, units, scales) or the qualitative features (e.g. abstract elucidation). *Delineate Procedures* is the step-by-step actions taken in the study, along with tools/instruments/materials/equipment and techniques. It provides other scholars with the how-to instructions to replicate your study in different contexts and/or with different participants. *Rationalize Study Decisions* justifies choices made during data acquisition and study procedures.

WRITING STRATEGIES FOR ANALYZE THE DATA

Now we are on to the final goal of Methods and often the one that comes at the end of the Methods section—*Analyze the Data*. *Analyze the Data* is a Goal that provides information about the data analysis conducted in the study. It can contain information about how the data were prepared for the analysis, as well as statements of credibility pertaining to the analysis. There are two key Strategies that are often used to achieve this Goal: **Describe Analysis** and **Rationalize Post-study Decisions**. Like always, none of them are obligatory, but using a combination of several strategies can strengthen your communicative intent.

Strategies for Achieving Goal - *Analyze the Data*

WRITING STRATEGIES FOR DESCRIBE ANALYSIS

Describe Analysis can be used to describe how data were prepared for analysis and to describe the actual data analysis. We also use this Strategy to communicate how data were selected (e.g., sampling, screening, cleaning, inclusion/exclusion or even correction). For interview data, you may describe the transcription process or for survey data, you may discuss how data were entered for analysis. Finally, this Strategy can be used to describe how the analysis was conducted and to indicate what was used, i.e. procedures for analysis (e.g., statistical techniques, coding schemes).

At this point in your Methods, you need to start thinking about consistency. When you get to your Results, readers will think back to your data analysis to process the connection between what you said you would do and what you actually did. Thus, make sure that your data and numbers are consistent throughout the manuscript, starting here in the Methods section.

Let's take a look at some Language Use patterns for *Describe Data Analysis:*

- Data were processed with…
- …was organized and coded as themes emerged…
- …were transcribed verbatim…
- coding began with a preliminary coding scheme that included …
- Outliers were omitted based on…
- The response measurements were analyzed using…

- All statistical analyses were computed/performed using
- A similar analysis was conducted on…
- …were analyzed using…

WRITING STRATEGIES FOR RATIONALIZE POST-STUDY DECISIONS

Finally, like all other Goals in the Methods, we need to ensure our choices are sound. Thus, the final strategy is to **Rationalize Post-study Decisions**. This Strategy is used to establish the credibility of data processing and/or analysis. We also use the Strategy to present a rationale for our choices and to indicate what statistical analyses or procedures were employed to ensure credibility of analysis. Once again, we are seeing a strategy devoted specifically to the justification of our actions. We saw this strategy used in the beginning, in the middle, and now at the very end of the Methods section.

Oftentimes, statements of establishing credibility are given in a complete sentence, for example:

a. "**We secured credibility of the results by** member-checking, inter-coder agreement, rich and thick description of the cases, and external audit."

The rationale can also be tagged on as a short phrase at the beginning or end of a sentence:

b. "**To ensure accuracy,** data were coded by a second coder."

Examples **a** and **b** both make the credibility of the analysis quite explicit simply by including a rationale in writing.

Here are some other patterns you may discover, but be on the lookout for more!

- Because… only the X coefficients were used…
- ..is viewed as a threat to validity; therefore, …
- …in an effort to balance the risk of making either Type I or Type II errors…
- … was validated using previous studies…

SUMMARY: ANALYZE THE DATA

Let us recap the Goal – *Analyze the Data*. Remember that this Goal provides information about the data analysis conducted in the study. It can contain information about how the data were prepared for the analysis as well as statements of credibility pertaining to the analysis.

- *Describe the Data Analysis* includes describing what was done to the data and how data were prepared for analysis as well as descriptions of the actual analysis.
- Like all other Goals in the Methods, we need to ensure our choices are sound. Thus, the final strategy is to *Rationalize Post-study Decisions*, such as data processing and analysis.

ACTIVITY: MODEL ARTICLE ANNOTATION

For each section of the research article, you will be completing a model article annotation task. This task can be done using results from your Choose a Model Article and Compile a Corpus. You can choose to complete the task using a web-based software called Dissemity that contains a set of tools and automated feedback for analyzing research and later writing your work. The steps below will take you through the completion of this task by using Dissemity, but this task can be completed using any annotation or highlighting tools.

The objective of this task is to:

- help you analyze your model article for Goals, Strategies, and Language Use,
- visualize the argument structure of a good example piece of writing,
- practice being a critical reader to inform your writing process, and
- identify Language Use patterns.

Here are the steps for completing this task:

Step 1. Go to https://dissemity.com/ and create an account to get started. Watch the video introduction for help.

Step 2. Upon login, go to the **ANALYZE** module.

Step 3. Paste your model article from your Choose a Model Article and Compile a Corpus activity. If you copy and paste from a PDF, the formatting will need to be cleaned up in Dissemity. Just make sure there are no line breaks in the middle of a sentence by editing the file after pasting.

Step 5. Click on the first sentence and then use the dropdown menu to determine what Goal and Strategy are utilized. Remember that one sentence may accomplish multiple Goals and/or Strategies, but you should choose the most prominent one. Alternatively, you can use highlights or a technology that allows you to highlight sentences (e.g., a PDF viewer) in different colors.

Step 6. Annotate the Methods section based on what you have learned thus far. Your progress will save automatically in Dissemity. You can continue to annotate other articles in your corpus for additional practice and understanding of writing in your field. This is highly encouraged!

Step 7. Reflect on the following questions:

- Which Goals and Strategies seem to be most common in your field?
- Which Goals and Strategies seem to be least common, or nonexistent, in your field?
- What is the researcher trying to communicate through each Goal and Strategy?
- What have you learned from completing this task?

ACTIVITY: CORPUS EXPLORATION

For each section of the research article, you will be completing a corpus exploration task. Again, you can complete this task manually with your corpus of articles, or in Dissemity. You can submit Language Use patterns to Dissemity's **TOOLBOX** in the top right corner of Dissemity. You are going to focus on the **EXPLORE** module for this task, but the previous corpus annotation task may also be useful.

The objective of this task is to:

- discover how language helps to create meaning,
- explore explicit Language Use patterns that can make your communicative intent salient;
- help you form a language toolbox with patterns that can help you overcome writer's block.

Here are the steps for completing the task in Dissemity:

Step 1. Revisit the Model Article Annotation Activity and continue to explore your corpus of articles from the "Choose a Model Article and Compile a Corpus" activity. Search closely for Language Use patterns that help researchers communicate Goals and Strategies.

Step 2. Go to Dissemity and watch the Explore module tutorial for help.

Step 3. Go to the **EXPLORE** tab and search for some of the language patterns that you found in your model articles. For example, if you noticed the pattern **Data were collected** in your model to help *Describe Data Acquisition*, you might search for "data were" in the **EXPLORE** module to see if additional patterns emerge.

Note: You should really shy away from using Language Use patterns from articles that you consider to be models because you want your writing to be distinct. You want to find your own voice and not mimic someone else's voice. Therefore, the next step is critical for discovering a range of language use patterns to help you express a similar communicative intent as the researchers in your model articles.

Step 4. Record your findings in Dissemity's **TOOLBOX** (found in the top right corner). You should find a minimum of **three** (3) templates per writing Strategy (e.g., three from *Provide Background*, three from *Identify Pre-study Details*, and three from *Rationalize Pre-study Decisions*). If you cannot find any, that may be because your discipline does not use that strategy often. Just take note of this discipline-specific variation by adding a pattern that says "Not found in my discipline" rather than adding a language template.

Note: We are not looking for full sentences. We are looking for Language Use patterns that are not discipline specific and can be used across all disciplines. For example, we are looking for #1 below but not #2.

1. have been of increased **interest in** (YES)
2. These subcomponents of language performance have been of increased **interest in second language** development. (NO)

CHAPTER IV

CHAPTER FOUR: RESULTS SECTIONS

After establishing a sound Methodology, readers can build confidence that your research will contribute new knowledge to the field. However, that confidence is not solidified until you highlight the new knowledge that your research offers and how that knowledge is noteworthy in your Discussion/Conclusion. To this end, the Results section is where you report findings of your study, with emphasis on what is new. These findings should have a direct connection to the methodology or methodologies outlined in the manuscript, and they should be organized in a logical manner, usually by research question, research hypothesis, hierarchical themes, or chronology. Before we delve into the purpose, format, and communicative tools for writing Results, let's start by asking a few questions to help you evaluate your current knowledge:

1. Why are Results important?
2. What kind of information do you expect to see when you read Results?
3. What makes Results ineffective?

The Purpose

Prior to Results, you have been arguing for the value and rigor of your work. In the Results section, you have the chance to display the fruits of that work. Without surprise, the Results section is used to report research results or findings, but let us view the purpose of Results in a more analytical manner. Here, we remind you of the blue sky that we introduced in Chapter Two to indicate metaphorically the big picture of recent and relevant literature on the research topic. The Results add clouds to the sky to construct a new view of the current knowledge in the field. Thus, the purpose of results is to transform dry data, facts, and/or measurements into an eloquent and sound presentation of study outcomes. This presentation may be through visuals (e.g., tables and figures) that enable you to display the data and/or results with crystal clarity. In some disciplines, you may communicate your own understanding and interpretation of the results. This level of evaluation is appropriate when Results and Discussions are combined but should otherwise be held at a minimum, if included at all. In fact, some disciplines strongly discourage any interpretation of the Results in the actual Results section. We will explore conventions of your discipline as we continue in this chapter.

If you have a combined Results and Discussion section, interpretation of Results is more likely to happen along with reporting your Results. But, if you are just writing a Results section as unmerged with the discussion of your research, you will need to analyze your model articles carefully. Often, the results are left only to an objective reporting of results, leaving out any potentially subjective interpretations.

With that said, in this chapter, we focus on Results as a separate section from Discussion and Conclusion sections, but the same goals and strategies will apply regardless. We'll talk more about the similarities and differences as we go along.

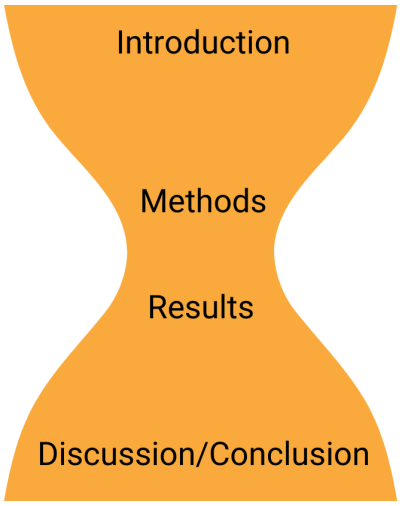
The Format

Before discussing the overall format of the Results section, choose a model article within your area of interest. A model article should represent strong research writing and ideally reflect a similar organization as the manuscript you are currently writing. Once you have chosen that model Results section, answer the following questions:

1. Where are the Results sections typically located?
2. How are the Results sections and subsections in your discipline named?
3. How are the Results sections in your discipline organized
4. What is the average length in pages of the Results sections in your discipline?

It is best to extend this analysis to all the articles in your Choose a Model Article and Compile a Corpus activity from Chapter One. In this way, you can get a general idea of patterns in your field rather than relying on knowledge from a single article.

Now that you have a general idea of the Results section, we can use the hourglass metaphor to better illustrate where it is located in a research article. The Results section is right at the center where all the information is still specific to your study. This section is the part of your argument where you build a case for the value of your work from credible evidence—your Results. To do this, we provide you with some general advice. First, focus on relevant results; if you've collected an expansive amount of data, it is possible that not all of your findings are directly relevant to your research question(s). Part of writing a good Results section is drawing your readers' attention to the most important outcomes and findings.



Format of Methods Resembles the Middle of an Hourglass

Second, information organization in the Results section should be the same as the

Methods section. Organize your information in the order presented in the Methods section (usually chronological) or from most to least important. In some disciplines, especially in the Social Sciences, the organization will be determined by the order of variables investigated. Taken together, your outcomes should clearly connect to your take-home messages.

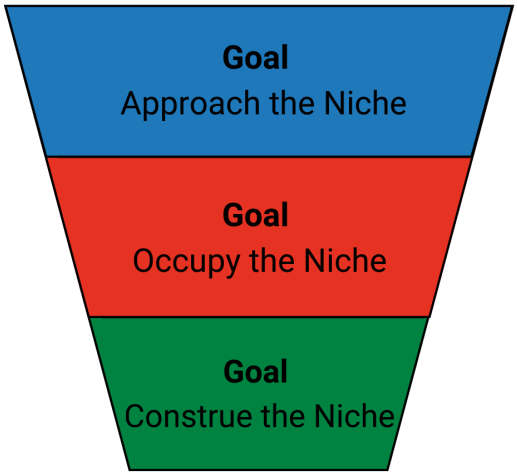
GOALS, STRATEGIES, AND LANGUAGE USE IN RESULTS

As a reminder, there are different tools for each section of the research article, and all these tools can be categorized into three sets: **Goals**, **Strategies**, and **Language Use**. *Goals* are used to communicate your overall argumentative intent. *Strategies* are used to achieve your goals, and *Language Use* connects the *Goals* and *Strategies* in meaningful ways to enable explicit and cohesive expression of ideas.

1. *There are **three** overarching Goals of a Results section. What do you think they are?*
2. *What common Language Use expressions (e.g., Table 1 illustrates...) have you used in Results? What do those expressions intend to communicate?*

Communicative Goals in Results

In research writing, our intent in the Results section is to begin reporting our findings to support our research argument. You can create a case from credible evidence by using **three** sets of Goals. **Approach the Niche** includes any information relevant to understanding your Results. This information was likely presented earlier in the manuscript and is used here to reinforce understanding of the study specifics leading to the actual Results. **Occupy the Niche** is where you highlight your Results in the form of in-text description or visual representations. **Construe the Niche** applies to those disciplines where a specific report of results may include some commentary that starts to expand outside the study, but this should be minimal at this point, if seen at all.



Three Communicative Goals in Results

Goal One: Approach the Niche

Starting with the first Goal, *Approach the Niche*, much of the information matches what has been disclosed in prior sections. This information is useful for focusing the reader's attention to the central

argument introduced in the Introduction and the main steps of gathering and analyzing data from the Methods. Sometimes, this information is new to the reader. That is, the information was not presented in the Introduction, Literature Review, or Methods sections. Background information that is new to the reader should not be central to the research argument but it might be useful for fully understanding how the Results came about to approach the gap or problem in the field.

Goal Two: Occupy the Niche

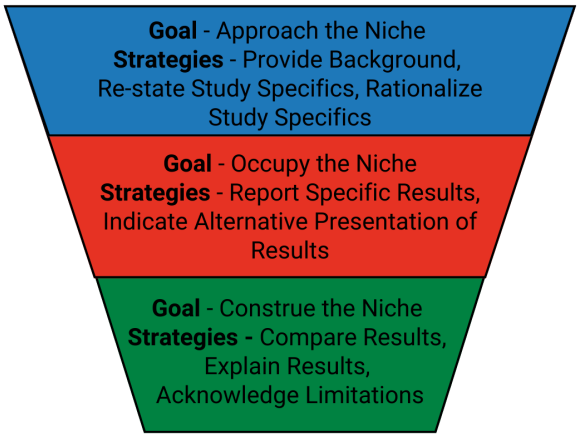
The second goal, *Occupy the Niche*, is likely the most extensive goal of the Results section. In fact, it is quite common for Results sections to start with this Goal. This Goal is all about study specific results, displayed either intertextually or by using visual presentations of your data. Visuals may include tables, figures, photos, or other types of artifacts. We will talk more about visuals later in the chapter.

Goal Three: Construe the Niche

Construe the Niche is for those few occasions when you begin commenting on specific results from the study. This commentary provides clarity to how the study results connect with what is known in the established research territory. This commentary is **not** about the study as a whole but rather it is about specific results. Broader discussion is left for the Discussion section, or sections with combined Results and Discussion. This Goal may be excluded or used minimally in many disciplines.

Writing Strategies for Achieving Goals in Results

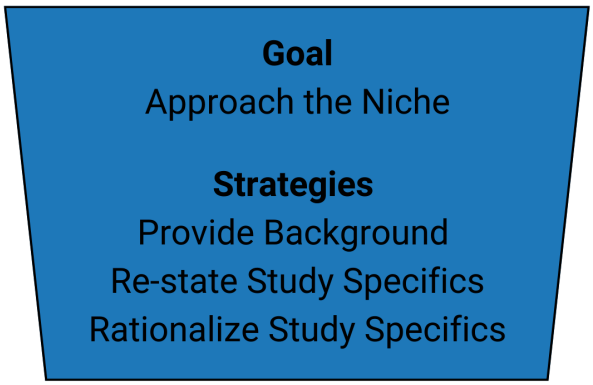
In the next sections, you will learn about the **eight** Strategies that will help you achieve the **three** Goals of Results. These Strategies will be useful for (1) analyzing model articles by visualizing how published authors achieve their communicative Goals and (2) facilitating your writing process by helping you utilize similar tools while maintaining your individual style and identity as a researcher. In this section, we will also provide examples of the Language Use for realizing each of the Strategies.



Overview of Goals and Strategies for Results

WRITING STRATEGIES FOR APPROACH THE NICHE

Approach the Niche can be used to foreground the presentation of results by reiterating relevant information from the Introduction and/or the Methods. Such information may include the study purpose and/or problem and specifics related to the study Methods. You may also use this Goal to preview the Results section as a way to orient readers through the content of the section. In essence, this Goal is about old information from earlier in the manuscript, and it helps to segue into the actual reporting of results. To achieve this goal, there are three main strategies: **Provide Background, Restate Study Specifics,** and **Rationalize Study Specifics**.



Strategies for Achieving Goal - *Approach the Niche*

WRITING STRATEGIES FOR PROVIDE ORIENTATION

Provide Orientation or provide background is a Strategy that we have seen in both the Introduction and the Methods. As seen in those sections, this Strategy is used to give theoretical, empirical or informational background about the study topic. This helps to situate the Results in the broader context of the research territory. Particularly useful is a reiteration of the research problem to help focus the reader's attention to the literature and Methods underpinning the study's value. This strategy may also be used to indicate the order of content that follows and to highlight noteworthy features of the section. Let us look at an example:

a. "**As was previously defined**, genre knowledge **refers t**o the ability to classify features of written texts as conventions of the research writing genre."

In this sentence, the phrase "as was previously defined" helps to indicate that an important construct definition was provided earlier in the paper and that construct is worthy of mentioning again to understand the Results. This Strategy is thus a way for the researcher to reinforce the importance of the construct and to add clarity to the Results.

Take a look at a few Language Use examples for this Strategy and note the similarity to what we see in the Introduction section.

- …have been described in numerous research publications involving …[List of Citations].
- …was carried out with…according to Author et al. and others [List of Citations].
- In this chapter, I present/demonstrate…
- We now present … followed by the specific findings related to …
- Results are presented as follows: …
- Initially, an overview of the results is provided.

WRITING STRATEGIES FOR RESTATE STUDY SPECIFICS

Restate Study Specifics is essentially any information from the Methods. Here, we may reiterate information about our data collection, procedures, or analysis. Any information that may be relevant for understanding how the Results transpired could be communicated using this Strategy. Every result included in your Results section should come from a process documented in your Methodology section. Otherwise, you risk confusing your reader.

Below are some Language Use patterns to help you understand the Strategy of *Restate Study Specifics*. Be on the lookout for more as you analyze published work in your field.

- The first research question addresses…
- Analyses were conducted to establish …
- Three different models were examined…
- The field survey was administered based on …
- Prior to testing the model's hypotheses,…
- Analysis was conducted…
- … was reapplied … to avoid interference with …
- To examine this potential problem,…

WRITING STRATEGIES FOR RATIONALIZE STUDY SPECIFICS

Seen throughout each Goal of the Methods section is language for rationalizing choices, so it's no surprise that we have a Strategy devoted to this in the Results. This Strategy we call *Rationalize Study Specifics*. As we learned in the Methods section, it is important to have sound reasoning for specific study choices made throughout the study. Sometimes those choices are explicitly reflected in writing. When those choices are divergent from the field or unique to your study, you may decide to reiterate your sound reasoning in the Results. This reasoning could help to ward off criticism of your choices and/or build credibility. Here is an example of Restate Study Specifics:

a. "**As suggested by [Authors, YEAR], it was not necessary** to correct for multicollinearity for correlations less than .70."

Here, the researcher rationalizes what was performed or not performed as suggested by previous research. The citation here is important for adding some weight to the decision. If the decision is a point of contention, there may need to be a second sentence to explain why such a process is **not necessary**. In other words, in some cases when the argument is not yet convincing, a deeper explanation may be needed.

Take a look at some Language Use patterns for *Rationalize Study Specifics*, and don't forget to critically read for these often subtle statements in Results sections of your field.

- Therefore, controlling for this effect is crucial…
- …were examined to ensure that …
- Thus, including…as a control variable was warranted.

SUMMARY: APPROACH THE NICHE

Let us recap the Goal – *Approach the Niche*. Remember that this Goal is used to scaffold the presentation of the Results. We do this by reiterating relevant information from the Introduction and/or Methods and by reemphasizing what motivated the study. We may also restate important study-specific details and rationalize choices leading to the presentation of results. In essence, this Goal is about old information from earlier in the manuscript, and it helps to segue into the actual reporting of results.

1. To achieve this goal, there are three main strategies: *provide orientation, restate study specifics,* and *rationalize study specifics.*
2. *Provide orientation* is used to give background information to the reader and/or orient the reader to content in the section.
3. *Restate study specifics* is essentially any information about the study choices from the Methods section.
4. Rationalize study specifics is used to provide justification for those choices.

Like stated before, you are not obligated to use all of these Strategies, but you will see which are frequently used by analyzing writing in your discipline.

WRITING STRATEGIES FOR OCCUPY THE NICHE

Strategies for Achieving Goal - *Occupy the Niche*

Now that you have been introduced to Strategies used to foreground the Results, here we discuss reporting the actual results. This Goal is what we call *Occupying the Niche*. At the beginning of your manuscript, you were expected to build an argument that identifies a niche in the established research territory. Maybe the niche is due to lacking or insufficient knowledge, or problems in the field. Now, you will occupy that space with the results from your study. Thus, the Goal of *Occupy the Niche* is to introduce new knowledge by presenting the results of the study in an explicit manner. We may do this in text or by using visual representations of the data.

It is important to stress that the results are not commented on or discussed here. This Goal is solely for informative, objective reporting. There are two Strategies that are often used to *Occupy the Niche*; you will likely find that these two Strategies take up the majority (if not all) of the Results section, especially in sections that are Results only as separate from the Discussion. These are **Report Specific Results** and **Indicate Alternative Presentation of Results.** Let us look at both of these strategies in depth.

WRITING STRATEGIES FOR REPORT SPECIFIC RESULTS

Report Specific Results is used to introduce the results of the study, addressing initial research aims, questions, and/or hypotheses in a logical order. While this Strategy serves many purposes, at the basic level, it enables researchers to share new knowledge in preparation for further discussion of how that knowledge contributes to the field. When reporting results, try to keep your descriptions concise. One way to do this is to eliminate phrases that establish passive-voice structures. When you use the active voice, your sentences will shrink, and your message will be clearer. This is different from the Methods where it is often the only place where passive constructions are typical.

Here is an example of a sentence with active construction:

a. "**The mixed ANOVA revealed** a statistically significant main effect for time, F(2, 54) = 53.707, p < .001, ? 2 = .499; for group, F(2, 54) = 3.309, p = .011, fip2 = .109; and for the interaction between time and group, F(2, 54) = 16.537, p < .001, ? 2 = .380."

The verb "**revealed**" in the past tense is a very common verb used in Results. Other verbs include: **showed, demonstrated, illustrated, observed**. This is not to say that you will never find passive constructions in published articles, such as **was observed**. However, we would encourage you to avoid them.

Conjugating verbs to the past tense suggests that the results are products of a process that occurred in the past. We will see how verb tense changes when referring to tables and figures. But first, here are some examples of patterns that you may see and can continue to pick out for your personalized toolbox of Language Use patterns:

- …noted ….…. when he stated, "…."
- The word "….." appeared specifically in ….of the cases …
- … analysis showed strong expressions of …
- … showed/revealed that …
- The results illustrated that…

WRITING STRATEGIES FOR INDICATE ALTERNATIVE PRESENTATION OF RESULTS

This Strategy is used to point to and/or summarize results in order to direct the reader to results that are visually displayed elsewhere (e.g., tables, graphs, charts, pictures, etc.). Also, this Strategy is utilized to help the reader see complex results in a more comprehensible, concise form, and to facilitate understanding of the results presented alternatively.

Using visual methods to present data is a great way of making your Results section easy to follow. If appropriate, consider using charts, graphs, tables or figures to present results, but make sure to title all alternative presentations carefully so that they are representative of the content they contain. Readers should be able to read and comprehend your visuals in isolation from the rest of the text. You should also point to these alternative presentations in text before they are inserted in the manuscript, usually in the paragraph immediately preceding its placement in the text.

If you are presenting data in figures or tables, the accompanying text should add new information or emphasize only the most important results that lead to the take-home messages of the research. That is, rather than simply repeat what your reader can already see in the figure/table, try to avoid repetition. If you are doubtful about how much information to include in your Results, you can usually add an appendix to streamline writing the Results section. Inserting your raw data into the appendix section or as supplementary data (if the publisher has such an option) allows readers to follow or replicate your calculations.

Here are a few additional tips when *Indicating Alternative Presentations of Results*:

- Figures and tables should be numbered consecutively in the order in which you mention them. Check journal guidelines for special considerations. In some cases, any alternative presentation of the results should be added at the end of the manuscript instead of within the text. Again, journal guidelines should specify what is expected upon submission.
- Your text should complement the graphical information and vice versa. If you are not able to describe information like controls, statistical analyses, actual p values, and key observations in your figure legends, table notes, or title descriptions, then include this information in the text of the Results section. As stated earlier, be sure to avoid repetition when possible or when repetition does not add value to your message.
- Summarize your results in the text, drawing on the figures and tables to illustrate your points.

> You should refer to every table or figure in the text. Anything you don't feel the need to highlight can safely be removed.

Now, take a moment to look through a set of articles for instances when the researcher points to a table or figure.

- *What verb tense is being used?*
- *What verb tense is used when the researcher is reporting the findings in the text?*
- *Is there a difference?*

You will notice that the authors often report findings within the text in the present or past tense. However, when referring to alternative presentation of results, the verb tense is often in the present tense as in the following sentence:

a. "**Table 3 shows** means and standard deviations for both groups of participants for gender and number agreement across the four conditions."

Other verbs may include: **illustrates, visualizes, summarizes, presents,** and **contains**. Here are some additional Language Use patterns:

- Figure X shows/gives/depicts/reveals/provides/displays
- According to the results in Figure X,…
- As can be seen in Table X, …
- As described in Figure X, …
- …appears in Table X.
- …as reported in Table X.
- It is clear from Figure X that …

SUMMARY: OCCUPY THE NICHE

Let us summarize these important points about *Occupy the Niche*. The Goal of *Occupy the Niche* is to introduce new knowledge by presenting the results of the study in an explicit, objective manner. We may do this in text or using visual representations of the data. When you *Report Specific Results*, introduce quantitative and or qualitative results of the studying. When you *Indicate Alternative Presentation of Results*, point to or summarize results in the form of a visual representation of the data. For either of these two Strategies:

- avoid repetition by not simply repeating what your reader can already see in the graph/table
- use an appendix to streamline writing the Results section
- keep your descriptions concise by avoiding passive constructions
- title all tables and figures carefully so that they are representative of the contents and understood in isolation
- number the figures and tables consecutively
- point to the alternative presentations of results in text before they show up in the manuscript
- summarize your results in the text, drawing on the figures and tables to illustrate and complement your points.

WRITING STRATEGIES FOR CONSTRUE THE NICHE

We are now on to the final Goal of pure Results sections, which is *Construe the Niche.* Again, the act of construing the niche suggests a level of interpretation to understand how the new knowledge (the study results) connects with what is known in the established research territory. As mentioned before, when Results are presented separately from Discussion sections, the majority of the section will typically be devoted to an objective report of the Results. In some instances, you may see some commentary on specific results, but not on the study as a whole. *Construe the Niche* is a Goal used to comment on and frame the results, establishing their meaning in the context of the study and possibly in relation to existing knowledge in the field. The Results are discussed through comparisons, explanations, interpretations, and deliberations that go just beyond the objective results. For example, you may have noticed an unusual correlation between two variables during the analysis of your findings. It is possible that you will want to highlight this correlation in the Results section to heighten the interest of this finding. If you feel the Results need extended commentary in this section, here are a few Strategies to help. The main Strategies for *Construe the Niche* are **Compare Results, Explain Results,** and **Acknowledge Limitations**. We will review these same Strategies when looking at the Discussion section in the next chapter.

Strategies for Achieving
Goal - *Construe the Niche*

WRITING STRATEGIES FOR COMPARE RESULTS

Compare the Results with previous work is used to highlight similarities or differences between empirical findings, theoretical beliefs, or previously made assumptions or predictions. These comparisons can be used to support the explanation or interpretations of results by relating your study with what is known in the field. By making these inter-study connections, you can strengthen the credibility of your work by explicitly highlighting the area(s) in which your work adds new knowledge.

While this Strategy may be uncommon in many Results sections, published researchers do utilize this Strategy to compare a specific finding to previous literature. Again, we are not yet talking about the study as a whole. This level of commentary should definitely be left for the Discussion section or sections where the Results and Discussion sections are combined. Here is an example:

a. "Students' increase in research writing strategy use was detected at each stage of the process, **which is inconsistent with Author (YEAR)**."

b. "The lack of this effect **was also reported by Authors (YEAR)**."

In example **a**, the language of comparison is tagged onto the end of a result and refers only to a specific result and not the study as a whole. This comparison also shows contrast between the present and previous research. In example **b**, the comparison takes place in a simple sentence, not taking up much discussion like what we would see in a Results and Discussion or a purely Discussion section. This example is also an instance where the Results are similar in nature. This is to say that comparisons can be made when results are similar or different from previous research.

Now let us take a look at some more language use templates:

- Similar to previous observations
- in agreement with
- is consistent with
- in contrast to Author (YEAR),
- Author (YEAR), on the other hand, found that…

WRITING STRATEGIES FOR EXPLAIN RESULTS

Explain Results is a Strategy that is used to elucidate what may have caused the results/outcomes. Here, researchers can suggest reasons, hypotheses, speculations and/or assumptions that may account for certain findings or justify the nature of those findings. *Explain Results* is also a great way to provide meaning or interpretation of the results through deductions and logical connections. Occasionally, researchers will disclose expected or unexpected results, highlight surprising or unsatisfactory findings, and connect findings to initial hypotheses. To achieve these aims, there are several **sub-strategies** that can be used to *Explain Results*:

- **explicate results** to better understand what the results mean
- **account for results** to identify reasons for why the results occurred
- **relate to expectations** to connect results to hypotheses or anticipations

The first sub-strategy is to *Explicate Results* from the present study. This sub-strategy can be used to explain what the results mean by interpreting or making inferences. Here is an example:

a. "**These results seem to suggest that** individual differences had an impact on students' writing production."

This sentence is used to provide preliminary interpretation of the results. It does so by softening the interpretation through the use of the linking verb **seem**, as in "**These results seem to suggest**." In a combined Results and Discussion section, this sentence should be drawn out by connecting the findings to prior research as a way of strengthening understanding of the results in relation to known information in the field. In a Results only section, this sentence may be used to heighten awareness of this principle finding, which will be further elaborated on in the Discussion section as a segue to main contributions or take-home messages. **Appear to** is another linking verb commonly used when explicating the results.

The second sub-strategy is to *Account for Results*. *Accounting for the results* entails explanation of the nature of the results, or why the result occurred. Take a look at the following example:

b. "**We claim that this finding may have been motivated by** students' individual differences."

Again, the language in this sentence is softened by use of the modal verb **may**. **May, might,** and **could** are all common modals used to provide explanation.

The final sub-strategy is to *Relate to Expectations*. Sometimes, researchers already have expectations for what the results will be. These expectations may be in the form of explicit hypotheses or general assumptions. Whether anticipated or not, the research may want to highlight the connection between findings and/or observations to these expectations. We often see this explanation in the form of phrases like: **as expected, surprisingly, noteworthy**. Here's another way to relate results to expectations:

c. "We hypothesized growth in all measures, **and that hypothesis was confirmed**."

This sentence takes the Results section just a hair beyond the objective reporting and into the realm

of discussion, but further explanation of the significance of this confirmatory statement should be left for the Discussion section.

Let us look closer at some Language Use patterns:

Explicate Results:

- Such findings seem to suggest/indicate that…
- This finding demonstrated that
- It is not easy to confirm if
- Appear to be
- It is evident that

Account for Results:

- This might be due to…
- is thought to be caused by
- this may be related to
- Another reason could be
- One explanation for … is…
- A possible reason for this could be that
- which may have contributed to the
- is mainly attributed to

Relate to Expectations:

- As expected, the effect of the treatment was…
- Surprisingly/noteworthy…
- The results are not surprising…
- This result is as expected, as this conclusion has been seen in previous research…
- Interestingly, it is not expected to….

WRITING STRATEGIES FOR ACKNOWLEDGE LIMITATIONS

Acknowledge Limitations is used to evaluate the study by pointing out the weaknesses of the study specifics and/or tone down their severity. Utilizing this Strategy enables writers to avoid overgeneralization, anticipate potential criticism, and ward off counterclaims. Typically, it is more beneficial for you to identify and acknowledge your own study's limitations than have them pointed out by a reviewer because the more red flags without explanation that the reviewer sees, the more likely it is that they may reject your work.

Keep in mind that acknowledgement of a study's limitations is an opportunity to make suggestions for further research. If you do connect your study's limitations to suggestions for further research, be sure to explain the ways in which these unanswered questions may become more focused because of your study.

Acknowledgement of a study's limitations also provides you with an opportunity to demonstrate to your professor that you have thought critically about the research problem, understood the relevant literature published about it, and correctly assessed the methods chosen for studying the problem. A key objective of the research process is not only discovering new knowledge but also to confront assumptions and explore what we do not know.

Claiming limitations is a subjective process because you must evaluate the impact of those limitations. Do not solely list key weaknesses and the magnitude of a study's limitations. To do so diminishes the validity of your research because it leaves the reader wondering whether, or in what ways, limitation(s) in your study may have impacted the findings and conclusions. Limitations require a critical, overall appraisal and interpretation of their impact. You should answer the question: do these problems with errors, methods, validity, etc. eventually matter and, if so, to what extent? For this reason, acknowledging them in the Results tends to take place because that is where we see their immediate impact. Here, we leave the more in-depth language use for this strategy for the Discussion section.

SUMMARY: CONSTRUE THE NICHE

Now let us recap the Strategies for *Construe the Niche*, or commenting on results. *Construe the Niche* is a Goal used to establish the meaning of Results in the context of the study and possibly in relation to existing knowledge in the field.

The Results are discussed through comparisons, explanations, interpretations, and relevant deliberations that go just beyond the "objective" results. You may achieve this goal using any of the following strategies:

- *comparing the results* with reported empirical findings, theoretical beliefs, and/or previously made assumptions or predictions
- e*xplaining why the results occur*, what the results seem to mean, or how the results relate to expectations
- *acknowledging limitations.*

SUMMARY OF GOALS/ STRATEGIES/ LANGUAGE USE FOR RESULTS SECTIONS

Here, we will recap the strategies and language use tips for the Results section. In Results, we want to build a case from credible evidence. We can build our case using three sets of goals: *Approach the Niche, Occupy the Niche,* and *Construe the Niche*.

A Results section, unmerged with the research Discussion, is specific to the study, but depending on your discipline, you may see the section move from specific to general –meaning that a specific report of results may include some commentary that starts to expand outside the study, but this should be minimal at this point, if seen at all.

Starting with the first goal, *Approaching the Niche*, we see much of the same information we have seen in other sections–this is old information. This information may be pieces from the Introduction or the Methods that help to reiterate important information for the reader or prepare the reader for the Results. Strategies for this goal include *Providing Background, Restate Study Specifics,* and *Rationalize Study Specifics.*

The second goal, *Occupy the Niche*, is likely the most extensive goal of the Results section. In fact, it is quite common for Results sections to jump right into this goal without providing any old information. Here, we have strategies of *Reporting Findings* or I*ndicating Alternative Presentation of Results.*

Then, *Construe the Niche* is for those few occasions when you begin commenting on specific results from the study, but it needs to be emphasized that this is not commentary on the study as a whole. This is left for the Discussion section or sections with combined Results and Discussion. Strategies that you may use include *Compare Results with Literature, Explain Results,* and *Acknowledge Limitations.*

Remember that there is no linear order for organizing your content to fulfill these communicative goals. Some communicative strategies are used more extensively than others. Different strategies can be combined to achieve a stronger communicative intent. The use of strategies varies depending on disciplinary conventions.

ACTIVITY: MODEL ARTICLE ANNOTATION

For each section of the research article, you will be completing a model article annotation task. This task can be done using results from your Choose a Model Article and Compile a Corpus. You can choose to complete the task using a web-based software called Dissemity that contains a set of tools and automated feedback for analyzing research and later writing your work. The steps below will take you through the completion of this task by using Dissemity, but this task can be completed using any annotation or highlighting tools.

The objective of this task is to:

- help you analyze your model article for Goals, Strategies, and Language Use,
- visualize the argument structure of a good example piece of writing,
- practice being a critical reader to inform your writing process, and
- identify Language Use patterns.

Here are the steps for completing this task:

Step 1. Go to https://dissemity.com/ and create an account to get started. Watch the video introduction for help.

Step 2. Upon login, go to the **ANALYZE** module.

Step 3. Paste your model article from your Choose a Model Article and Compile a Corpus activity. If you copy and paste from a PDF, the formatting will need to be cleaned up in Dissemity. Just make sure there are no line breaks in the middle of a sentence by editing the file after pasting.

Step 5. Click on the first sentence and then use the dropdown menu to determine what Goal and Strategy are utilized. Remember that one sentence may accomplish multiple Goals and/or Strategies, but you should choose the most prominent one. Alternatively, you can use highlights or a technology that allows you to highlight sentences (e.g., a PDF viewer) in different colors.

Step 6. Annotate the Introduction section based on what you have learned thus far. Your progress will save automatically in Dissemity. You can continue to annotate other articles in your corpus for additional practice and understanding of writing in your field. This is highly encouraged!

Step 7. Reflect on the following questions:

- Which Goals and Strategies seem to be most common in your field?
- Which Goals and Strategies seem to be least common, or nonexistent, in your field?
- What is the researcher trying to communicate through each Goal and Strategy?
- What have you learned from completing this task?

ACTIVITY: CORPUS EXPLORATION

For each section of the research article, you will be completing a corpus exploration task. Again, you can complete this task manually with your corpus of articles, or in Dissemity. You can submit Language Use patterns to Dissemity's **TOOLBOX** in the top right corner of Dissemity. You are going to focus on the **EXPLORE** module for this task, but the previous corpus annotation task may also be useful.

The objective of this task is to:

- discover how language helps to create meaning,
- explore explicit Language Use patterns that can make your communicative intent salient;
- help you form a language toolbox with patterns that can help you overcome writer's block.

Here are the steps for completing the task in Dissemity:

Step 1. Revisit the Model Article Annotation Activity and continue to explore your corpus of articles from the "Choose a Model Article and Compile a Corpus" activity. Search closely for Language Use patterns that help researchers communicate Goals and Strategies.

Step 2. Go to Dissemity and watch the Explore module tutorial for help.

Step 3. Go to the **EXPLORE** tab and search for some of the language patterns that you found in your model articles. For example, if you noticed the pattern heightened interest in your model to help *Claim Centrality*, you might search for "interest" in the **EXPLORE** module to see if additional patterns emerge.

Note: You should really shy away from using Language Use patterns from articles that you consider to be models because you want your writing to be distinct. You want to find your own voice and not mimic someone else's voice. Therefore, the next step is critical for discovering a range of language use patterns to help you express a similar communicative intent as the researchers in your model articles.

Step 4. Record your findings in Dissemity's TOOLBOX (found in the top right corner). You should find a minimum of three (3) templates per writing Strategy (e.g., three from *Claim Centrality*, three from *Provide Background*). If you cannot find any, that may be because your discipline does not use that strategy often. Just take note of this discipline-specific variation by adding a pattern that says "Not found in my discipline" rather than adding a language template.

Note: We are not looking for full sentences. We are looking for Language Use patterns that are not discipline specific and can be used across all disciplines. For example, we are looking for #1 below but not #2.

1. have been of increased **interest in** (YES)
2. These subcomponents of language performance have been of increased **interest in second language** development. (NO)

CHAPTER V

CHAPTER FIVE: DISCUSSION AND CONCLUSION SECTIONS

In this chapter, we will discuss the Discussion and Conclusion (D/C) section, which serves to deepen the readers' knowledge on the research topic and to demonstrate the contribution, larger implications, novelty, and potential impact of the research. This section can be difficult to write because it requires the author to contextualize the key results, draw conclusions about their meaning, and discuss how the results expand on the knowledge generated by earlier, related research. Crucially, then, this section is not simply a summary of the research. It is important for researchers to extend analysis through an evaluative and interpretive angle.

Before we delve into the goals and strategies for achieving the key aims of the D/C section, let us start by reflecting on what is already known about this section. Answer the following questions, and if possible, discuss them with a peer or a fellow researcher:

- Why are Discussion/Conclusion sections important?
- What kind of information do you expect to see when you read Discussion/Conclusions?
- What makes a Discussion/Conclusion section ineffective?

The Purpose

The purpose of D/C sections is to provide an extended analysis of the research results. A summary of the study is simply not enough to clarify what the research means for the advancement of the field. Expanding the meaning of the results outside of the reported study centralizes how the results relate and add to existing knowledge in the field (often by making connections to previous research introduced in the Introduction and/or Literature Review).

The D/C is also important for outlining the value of new findings. Explicitly sharing why and how findings may be of interest or valuable for future research and/or applications can set up a convincing culmination of the scientific argument. This culmination should lead to the **take-home messages** of the study. A take-home message is a core idea that readers should understand after reading a study. The idea or ideas should be connected to the main claims presented at the beginning of the manuscript. Think about how you started your manuscript in the Introduction section. When starting the scientific

argument, researchers should problematize the research territory (Review Chapter 2 for strategies to Indicate the Niche.) The take-home message in the D/C section should then demonstrate how the present study solves, or begins to solve, key problems, fills in gaps in knowledge, answers lingering questions, and/or provides evidence to address a hypothesis. The take-home message, therefore, may include two to four interrelated concepts that represent the essence of the study in a simple, straightforward idea or thought. While doing so, be sure to avoid peripheral topics that can distract the reader from this central focus of the study.

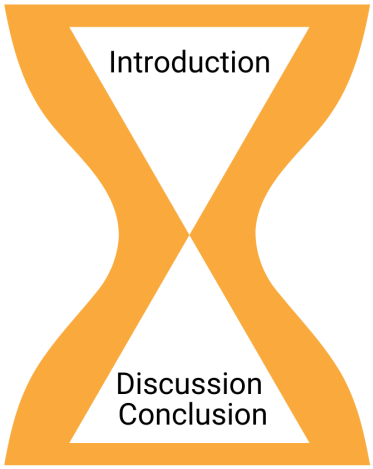
In the Results section, you may have commented on very specific findings to guide the reader through an understanding of your study contributions. In the D/C, you are expanding that discussion beyond individual results to a broader view of your study, placing your study within the context of previous work and discussing its potential impact.

The Format

Before discussing the overall format of the D/C section, choose a model article within your area of interest. A model article should represent strong research writing and ideally reflect a similar communicative intent to the manuscript you are writing. Note that your model article might have separate Discussion and Conclusion sections, or it might combine Results and Discussion and separate the Conclusion. These differences will be discussed throughout the remainder of this chapter. Once you have chosen a model D/C section, answer the following questions:

1. Where are the D/C sections typically located?
2. How are the D/C sections and subsections in your discipline named?
3. How are the D/C sections in your discipline organized
4. What is the average length of the D/C sections in your discipline?

It is best to extend this analysis to all the articles in your Choose a Model Article and Compile a Corpus activity from Chapter One. In this way, you can get a general idea of patterns in your field rather than relying on knowledge from a single article.



Format of Discussion/Conclusion Resembles a Mirror of the Introduction

Let's turn now to the hourglass metaphor discussed throughout the book. The top (Introduction) and bottom (Discussion/Conclusion) are like mirror images of each other. Instead of a general to specific progression of information as seen in the Introduction, the D/C section moves from specific to general information by transitioning from the narrow details of the study to a broader understanding of the discipline. Here's how:

1. The D/C section will often start with an interpretation of the study results, connecting that interpretation to principal findings and often to evidence from existing research.
2. The D/C section is likely to continue by broadening the discussion slightly and providing relatively detailed discussion demonstrating how the study supports or contradicts current thinking. This often involves specific reference to existing literature.
3. The D/C section commonly ends with indications of future directions for the field in light of the core strengths (and sometimes limitations) of the present study. The ending should add a final boost of confidence to the present study by highlighting the study's significance.

Overall, the format of the D/C section may vary across and within disciplines, so here is some general advice that you might consider for when you draft your D/C section:

1. **Reiterate the research problem**. Remind the reader of your central argument and the niche you defined in the Introduction section (see Chapter 2.4.2). By doing so, you can better frame the D/C and segue into your take-home messages.
2. **State the principal findings of the study**. The D/C section is not the place for restating all of your findings. Again, each study may have between two to four take-home messages. Determining which findings are central to those messages will enable you to prioritize the principal findings in your D/C section.
3. **Explain the meaning of the findings**. Discussion of principal findings can take on many shapes. In the next section, we will discuss the strategies for achieving an expanded analysis of the findings. In brief, you should consider what the results mean, why the results occurred, and how the results relate to your expectations.
4. **Relate the findings to those of similar studies**. All studies are grounded to some extent in previous literature. Showing how your study extends from existing knowledge will emphasize the value added to the field.
5. **Avoid over-interpretation and unwarranted speculation on the results**. Have you ever heard the expression based on Aristotelian notions, "Let the data speak for themselves"? This expression, used in various contexts, suggests that researchers need to make data-centric interpretations rather than forcing data into an interpretation that fits a targeted narrative.
6. **Reveal future direction of research**. Research should never start and stop with just one manuscript. There is always more research to be conducted. Oftentimes, the details of future direction are vaguely construed in the D/C section to motivate independent thought and

enable research teams to continue on their own paths forward while maintaining a collaborative spirit across research teams.

7. **State value and contributions explicitly**. Arguably the most important content in the D/C section is indication of the research value and contributions to the field. These statements should be made explicitly, using thoughtful word choices so that readers do not have to make their own inferences.

While this general advice is hopefully useful for gaining a bigger picture of what the D/C section should achieve, more specific advice will enable researchers to write these sections. Let's turn now to our writer's toolbox and the set of tools used to conclude the research argument.

GOALS, STRATEGIES, AND LANGUAGE USE IN DISCUSSION/CONCLUSIONS

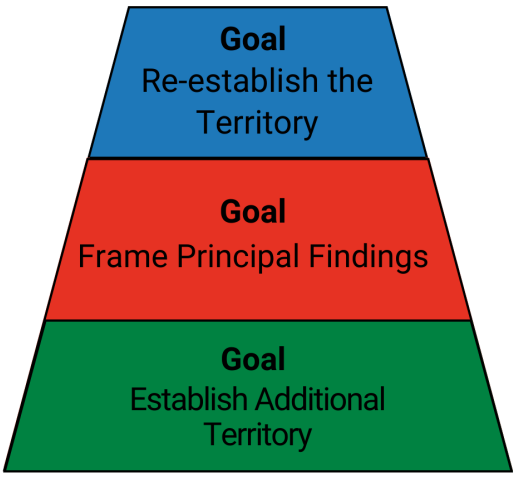
As a reminder, there are different tools for each section of the research article, and all these tools can be categorized into three sets: **Goals, Strategies,** and **Language Use**. *Goals* are used to communicate your overall argumentative intent. *Strategies* are used to achieve your goals, and *Language Use* connects the *Goals* and *Strategies* in meaningful ways to enable explicit and cohesive expression of ideas.

1. *There are **three** overarching Goals of a Discussion/Conclusion section. What do you think they are?*
2. *What common Language Use expressions (e.g., The study suggests that...) have you used in Discussion/Conclusion sections? What do those expressions intend to communicate?*

Communicative Goals in Discussion/Conclusions

Remember that Goals are used to communicate the overall argumentative intent of a section. In the D/C section, the intent is to deepen knowledge and contribute to the field. Researchers can achieve this intent by using **three** main Goals. The first Goal, **Re-establish the Territory**, helps to ground the research discussion by bringing in relevant background information from the Introduction, Methods, and/or Results that may be necessary to better contextualize the Discussion. The second Goal, **Frame Principal Findings**, is the heart of the D/C section, hence its figurative red color. Here, we discuss the results and establish their meaning based on existing knowledge in the field. This Goal is also devoted to the need for updating current literature by supporting or countering previous research using evidence from the present study. Finally, the last Goal

is to **Establish Additional Territory** by expanding the principal findings to broader contexts, applications, and other follow-up actions.



Three Communicative Goals in Discussion/Conclusions

Goal One: Re-establish the Territory

Discussion sections often begin by reintroducing relevant background information to *Re-establish the Territory*. This goal, represented by the color BLUE in our annotation framework, is used to contextualize the argumentation that follows. The information provided may or may not have been introduced earlier in the paper, but it is quite common to pull relevant information from the Introduction, Methods, or Results. Restating background information can help to emphasize the paper's central message(s) and provide a cohesive tie from the beginning to the end of the manuscript. This information can be theoretical and/or empirical and may also contain a recapitulation of study-specific details and statements of principal findings. In manuscripts where Conclusions are separate from Discussions, this goal is used to wrap up the paper by summarizing main points to provide background for conclusive remarks.

Goal Two: Frame Principal Findings

The second Goal of the D/C section is to *Frame Principal Findings*. The intent of this is similar to that of commenting in the Results section, if commenting exists at all in the Results. Commentary in the D/C section differs, however, in that it approaches the findings from a broader perspective that extends meaning beyond individual results. In the D/C section, the meaning of results is established based on existing knowledge in the field. The existing knowledge should help to determine logical reasoning, explanations, interpretations, and relevant deliberations that go beyond the "objective" results and/or beyond the framework of the study.

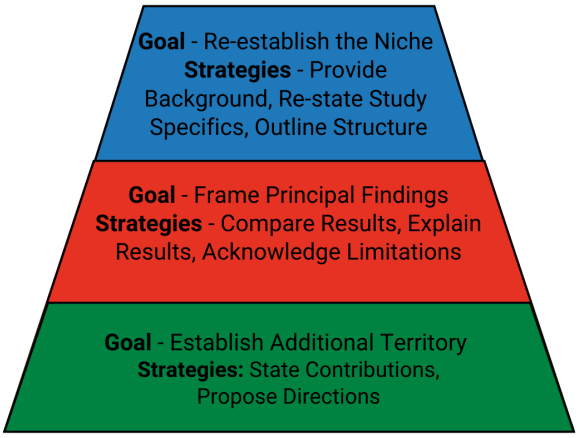
Goal Three: Establishing Additional Territory

The final Goal of the D/C section, and perhaps of the whole manuscript, is to *Establish Additional Territory*. Remember that our Goal in the Introduction section was to *Establish a Territory* to which our research seeks to contribute (see Chapter 2). The D/C section is an opportunity to show where the field is going by expanding this territory into new directions for the future. Thus, this goal is used to expand beyond the principal findings and/or beyond the study specifics to the broader context of the discipline. We may draw conclusions, evaluate the study, highlight the significance of the study, and/or recommend follow-up actions. For documents in which the conclusion is presented separately from discussion, the conclusion section tends to be used mostly for this goal of *Establishing Additional Territory*.

The metaphoric use of colors in the D/C section can help you visualize the argument structure of published models. Note that the BLUE in the D/C section resembles the blue sky, spanning all relevant information to foreground the section content. The RED is the heart of the D/C where the principal results are fully discussed in relation to existing knowledge in the field. The GREEN highlights current and future growth and development in the field and on the topic.

The next sections introduce the **eight** Strategies for achieving the three Goals of Discussion/ Conclusions. These Strategies will be useful for (1) analyzing model articles by visualizing how published authors achieve their communicative Goals and (2) facilitating your writing process by helping you utilize similar tools while maintaining your individual style and identity as a researcher. In this section, we will also provide examples of the Language Use for ensuring a cohesive connection between Goals and Strategies used to communicate your research with clarity.

Writing Strategies for Achieving Goals in Discussion/ Conclusions



Overview of Goals and Strategies for Discussion/Conclusions

WRITING STRATEGIES FOR RE-ESTABLISH THE TERRITORY

Re-establish the Territory is used to foreground the discussion by reiterating relevant information from the Introduction, Methods, and/or Results. Such information may include the study purpose, problem, and specifics related to the study Methods/Results. You may also use this Goal to preview the Discussion section as a way to orient readers to the content of the section. In essence, this Goal is about old information from earlier in the manuscript, and it helps to segue into the heart of the D/C section. To achieve this Goal, there are three main Strategies: **Provide Background**, **Re-state Study Specifics**, and **Outline Structure**.

Strategies for Achieving Goal - *Approach the Niche*

WRITING STRATEGY: PROVIDE BACKGROUND

Strategy: Provide Background

You might recognize this strategy from its various uses in the Introduction, Methods, and Results sections. In Discussion and Conclusion sections, *Provide Background* helps to set the stage for a broad reflection on the study. Providing background gives theoretical, empirical, or informational background about the study topic as a means of situating the study or the results more specifically in the broader context of the field. You can also use this Strategy to briefly reiterate the research problem(s), re-visiting key sources already cited in your Introduction or Literature Review sections. Importantly, the information here should not simply repeat or rearrange information from the Introduction. Where, in the Introduction, the intent was to argue for the study's relevance, in the D/C, the intent is to substantiate claims of the topic relevance by leading the reader to a better understanding of how the study moves the field forward. While serving slightly different functions in D/C sections, Language Use patterns for this Strategy are similar to patterns previously discussed for other sections, so we will move on to the next Strategy in D/C Sections.

WRITING STRATEGY: RESTATE STUDY SPECIFICS

Some specific details from the Methods and Results are directly applicable to your central argument or claims about the study's relevancy or contribution. These details should be restated to clarify important elements in the research story. *Restate Study Specifics* is thus used to clarify the connection between certain study details and succinct take-home messages. When take-home messages are related to methodological contributions, details about the methodology should be reiterated to lead into a discussion of how those methodological choices move the field forward. If the take-home messages are related to filling knowledge gaps, details about the noteworthy findings to attain the research objectives, questions, and/or hypotheses should be highlighted. And if the contribution is theoretical, revisiting the theoretical underpinnings that drive the current study may add clarity to the expected contributions. In essence, this Strategy is used to front any relevant information from earlier in the manuscript to help foreground the discussion to come after.

To use this Strategy for re-establishing the territory, it is important to write a direct, declarative, and succinct proclamation of the study details. Remember that at this point, your Methods and Results are old news; the readers need only reminders of which portions of the Methods or Results are the most important to the main contributions. New information should not be presented in the form of new data or new findings. Although you might occasionally include in this section new tables and figures to deepen discussion, these visuals must not contain new data, which should be confined to the Results section.

As a final point, when re-iterating your principal findings or key methodological decisions that were described earlier in the manuscript, consider using **past tense verbs** consistently. Here is an example of how summarize the study using the past tense:

- "**In summary, we did not detect** any changes in the language of trainees, at least not of the same kind as those persons studying for an extended period of time."

Here, the key words, "in summary" indicate a summative report of the findings. Take a look at a few Language Use examples for this Strategy and note how these additional examples are also summative rather than focused on discrete details of the study.

- In closing, we reiterate our key findings …
- This study found that, overall, the use of … is largely driven by …
- The results showed that the relationship between … and … held across all levels of …
- The analysis revealed that there are currently certain challenges in …

It is important to note that the most common error made in the D/C section is restating all of the results and not excluding the less important ones or ones that are peripheral to the central contributions. That is, this section is NOT solely a summary of findings. In many cases, your D/C section may start with a restatement of a key finding of the study (BLUE) followed by a discussion of what that finding means in a broader context (RED). We will learn more about the RED as we get into the Goal: Frame Principal Findings. For now, note that too much BLUE without any RED turns your D/C section into a summary text when it should be an evaluative text representing all three colors (BLUE, RED, and GREEN).

WRITING STRATEGY: OUTLINE STRUCTURE

Outline Structure is used to preview the content of the D/C section and orient the reader to noteworthy features of the text. Typically used in longer Discussion sections, this Strategy is especially helpful if writing a thesis or dissertation, enabling writers to lay out the organization of this section. As mentioned before, the D/C section typically moves from specific to general information about the research topic, but researchers may also consider keeping the same information flow across the Results, Methods, and Discussion sections. The general to specific structuring helps readers develop a rhythm as they read, and parallel information flow facilitates their comprehension. Either way, readers need to be able to follow the logic of organization. Take a look at the following excerpt, for example:

- "In this section, **we first provide an overview of key findings** from our study followed by a general discussion in response to previous literature. **We then focus on future directions** for our work and how our research can be used in broader contexts."

Here are some other Language Use patterns you may find:

- First we outline … and then we …
- Here, we first synthesize and discuss the main findings, and we subsequently reflect on …
- We outline below a number of recommendations and considerations which should be taken into account in future …

SUMMARY: RE-ESTABLISH THE TERRITORY

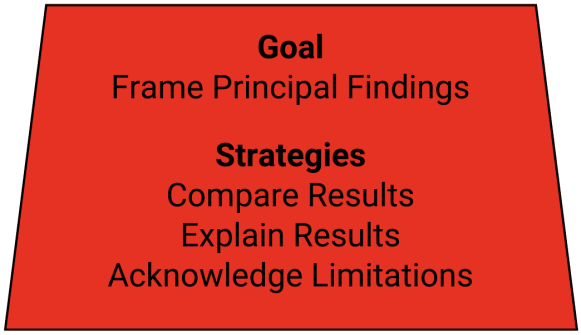
Now, let us recap the first Goal in D/C sections. *Re-establishing the Territory* brings in relevant background information that may be needed to "set the scene" or contextualize the discussion. This information quite commonly includes important details from the Introduction, Literature Review, Methods, or Results. By setting the scene, readers can better understand the interpretations of results that follow. To achieve this goal, there are three main Strategies: Provide Background, Restate Study-specifics, and Outline Structure.

1. *Provide Background* is used to present theoretical, empirical or informational background about the study topic. In a D/C section, this primes your reader for thinking about how the results of your study fit into your discipline at large.
2. *Restate Study-specifics* is used to reiterate, synthesize, or summarize key methods or findings of the study. Not all details are equally important, so emphasize information that is important for understanding the key take-home messages.
3. Finally, *Outline Structure* is used to indicate the structure or the content of the section. This Strategy is not common in short manuscripts but can be helpful when the discussion is extensive and involves multiple studies.

As stated before, you are not obligated to use all of these Strategies, but you will see which are frequently used by analyzing writing in your discipline.

WRITING STRATEGIES FOR FRAME PRINCIPLE FINDINGS

In this section, we preview the writing strategies for *Frame Principal Findings*. Represented by the color RED, this Goal is the heart of the Discussion/ Conclusion section. Here, the purpose is to present interpretations of your study so that your outcomes have meaning within the broader context of the field. The Strategies used here are the basis of the actual "discussion" and should thus be extensively used throughout the section. There are **three** Strategies that are often used to *Frame Principal Findings*: **Compare Results, Explain Results,** and **Acknowledge Limitations**.



Strategies for Achieving
Goal - *Frame Principal Findings*

WRITING STRATEGY: COMPARE RESULTS

Compare Results is a way of relating principal methods or findings from the present study to previously reported empirical findings, theoretical beliefs, assumptions, or predictions. This Strategy is especially helpful if previous studies raised questions that motivated your study, if findings of other studies support your findings, or if your study differs from similar studies in any way. Connections to previous works can **support** existing knowledge to build on what is known in the field or **counter** that knowledge to potentially identify additional gaps or problems worthy of future investigation. Supporting results of previous works can strengthen credibility of your findings and the findings of other researchers. By identifying similarities, more assumptions and generalizations about the field are possible, thus transcending mere speculation into productive interpretation that holds stronger meaning for the discipline at large. Countering claims in previous work may open new paths to future research, but it is important to avoid what some call **"The Bully Pulpit."** The Discussion section is not a place to criticize other studies, attacking investigators and their scholarly research. Although you should contrast your findings to other published studies, this should be done professionally by suggesting the limitations of previous work and demonstrating how your work expands or questions existing knowledge.

When **supporting study findings through evidence**, statements of similarity, agreement, concurrence, conformity are used frequently. As you may expect, the language of **countering with evidence** includes statements indicating difference, disagreement, contrast, and divergence. Here are some language patterns found in literature:

Support with Evidence	**Counter with Evidence**
• Compared with the method presented by Author (YEAR), …provide similar…	• …but the magnitudes of the main effects are different from the findings reported in Author (YEAR).
• similar findings were found in the reported references	• This is in contrast to Author (YEAR), who showed…
• Similar to previous observations	• …were higher than the ones obtained in a similar study.
• in agreement with those obtained under other conditions	• Author (YEAR), on the other hand, found that…
• this observation is consistent with other studies	• …but falls short of … reported by Author (YEAR).
• These results are in good agreement with previous results	• The results of the Author (YEAR) and this study were inconsistent…
	• This finding differs from much of the research…

WRITING STRATEGY: EXPLAIN RESULTS

Explain Results is a common Strategy used in most disciplines to ground the discussion in the D/C section by offering various interpretations of the study results. When utilizing this Strategy, it is important to **emphasize the positive**. One of the biggest errors scientific writers make in their Discussion is to exaggerate the findings. Speculation is fine as long as you acknowledge that you are speculating and you do not over-interpret your data. Otherwise, you may come across as sounding arrogant, condescending, or patronizing. So, avoid language that implies causality when your study can only make relational conclusions. Try to use language like "may" "could" "is likely" when there is a shadow of a doubt.

Additionally, you should **consider alternative explanations** of the findings. Despite efforts to remain objective, it is easy to consider only those explanations that fit your bias. It is important to remember that the purpose of research is to discover and not to prove. When writing the Discussion section, it is important to carefully consider all possible explanations for the study results, rather than just those that fit your hypotheses or biases.

Finally, **avoid over-interpretation and unwarranted speculation**. It is easy to inflate the interpretation of the results. Be careful that your interpretation of the results does not go beyond what is supported by the data. The data are the data: nothing more, nothing less. The Discussion should remain focused on your data and the participants and/or instruments in your study.

To thus utilize this Strategy effectively, you may consider a set of Sub-strategies to explain your results:

- **Account for Results** explains why the results occurred;
- **Explicate Results** explains what the results mean; and
- **Relate to Expectations** explains how the results were anticipated or unanticipated .

Let's consider a couple of examples that illustrate how commenting in Discussion sections is different from commenting in Results only sections. These first examples are used to *Account for Results*. Note that Account for Results is a Sub-strategy used to determine the nature of results (i.e., accounting for why the results occurred….). Which do you think is accounting in the Results section and which is accounting in the Discussion section?

1. *"**These findings may be because of** decreases in mental health **and may be explained by** those with lower intelligence not receiving accurate diagnosis."*
2. *"The statistically significant increase **is likely due to** students' initial level of motivation at the start of class."*

While both sentences have a chance of making their way into a Results section, Example 1 is more general, representing these findings or the findings as a whole. Example 2 is more specific to a single

result—*The statistically significant increase*. Thus, the first example is more common in Discussions and the second is more typically used in the Results.

Here are two more examples associated with *Explicate Results*, which is the Sub-strategy used to provide an interpretation of what the results mean. Which sentence is more likely to be found in the Results section and which is more likely to be found in the Discussion section?

1. *"Only 10% of students failed to submit a final manuscript for publication,* ***suggesting that*** *the course was successful in helping them publish faster."*
2. *"****The experimental results indicate*** *that practice* ***may be*** *essential for heightening language awareness."*

We see that in Example 1, the bolded parts are used to explain the meaning of the specific results highlighted at the beginning of the sentence, thus being better fit for the Results section. Example 2 is more general, referring to the experimental results as a whole.

The final Sub-strategy is *Relate to Expectations*. Expectations should be grounded in theoretical and/or empirical knowledge, and oftentimes these expectations are the foundation for research hypotheses. Results that match or contradict these expectations may be worthy of discussion or commentary on whether or not the results were anticipated. If appropriate, note any unusual or unanticipated patterns or trends that emerged from your results. In case you reach unexpected results or patterns, you should explain them and clarify their significance (or new avenues for future research) in connection to the research issue.

If you obtain unexpected results that change your study's value or contributions, you may need to revisit your entire research argument, starting in the Introduction section, and revise so that those new contributions are noted. Sometimes, unexpected results can drive new research agendas, so they will not require you to revise your argument. Instead, consider segueing into a discussion of future research.

The following examples illustrate this Sub-strategy—*Relate to Expectations*.

1. "**Not surprisingly,** secondary school children enjoyed more mobility licenses and were more independent in their school travel and weekend activities."
2. "**Unexpectedly,** test content (i.e., the competences measured in the tests) did not moderate the gender effect."
3. "In this respect, **our data support the hypothesis** that imprinting-like phenomena in human facial attraction may be built on associative experiences which affect preferences from childhood onwards."

Example 1 and 2 illustrate how a simple transition can indicate whether a result was expected (Example 1) or unexpected (Example 2). Example 3 related the findings to expectations laid out in the research hypothesis, which is usually disclosed early on in the manuscript.

Here are some additional Language Use features that will help in discovering additional patterns:

Account for Results	Explicate Results	Relate to Expectations
• This might be due to… • …is thought to be caused by… • this may be related to… • One explanation for … is… • A possible reason for this could be that… • is mainly attributed to…	• Such findings suggest/indicate that… • As indicated by… • Results are less clear… • This finding demonstrated that… • It is not easy to confirm if… • …appear to be…	• As expected, the effect of this treatment was… • Surprisingly/noteworthy • The results are not surprising. • This result is as expected, as this conclusion has been seen in previous research. • Interestingly, it is not expected to …

Remember that sophisticated argumentation combines multiple Goals and Strategies to achieve an overall aim for a section. Re-establish the Territory (BLUE) is therefore best integrated into your D/C section when coupled with Strategies in Frame Principle Findings (RED). For example, you might summarize a principal finding (Restate Study Specifics) and then discuss why the result occurred (Explain Results-Account for Results).

WRITING STRATEGY: ACKNOWLEDGE LIMITATIONS

Acknowledge Limitations is a Strategy used to point out the limitations of the study specifics and/or tone down their severity. It is important to remember that every study has limitations. Study limitations can exist due to constraints of research design or methodology, and these factors may impact the findings of your study. When limitations impact the findings, those limitations are particularly important to disclose in the Discussion section. Otherwise, they can be highlighted in previous sections, like the Methods or Results. Some researchers are reluctant to discuss the limitations of their study in their manuscripts, feeling that bringing up limitations may undermine the research value in the eyes of readers and reviewers. In spite of the impact limitations might have, you should clearly acknowledge any limitations in your research study in order to show readers—whether journal editors, other researchers, or the general public—that you are aware of these limitations and to explain how they impact the conclusions that can be drawn from the research. Acknowledging limitations is also ethical practice for rigorous and credible research.

Acknowledge Limitations is also a great way to transition into the final Goal in D/C sections where we *State Contribution* or *Propose Directions* (See next chapter). See the following sentences as examples of how to use language patterns to alleviate the severity of the limitations:

1. "**Even though** our results **do not show** that x = y, they nevertheless highlight that…"
2. "**Despite the fact that** … **was not able to predict** …., we believe our results are a major advance on the current state of the art."
3. "**The study contains several limitations** that could be addressed in future work."
4. "**Although our study is limited by** …., future work might fruitfully explore …."

In Examples 1 and 2, the introductory phrases are used to acknowledge limitations and then segue into a contribution. Examples 3 and 4 also utilize the introductory phrases to acknowledge limitations, but the segue proposes future directions.

In general, you can acknowledge limitations of your study by using language patterns that come at the beginning or end of the sentence. Limitations can also take the form of full sentences. Here are more Language Use patterns:

Acknowledge Limitations

- The major limitation for implementing the data is …
- … is a major concern.
- The error may still lead to a wrong conclusion that …
- A key/major/main/possible limitation is …

SUMMARY: FRAME PRINCIPLE FINDINGS

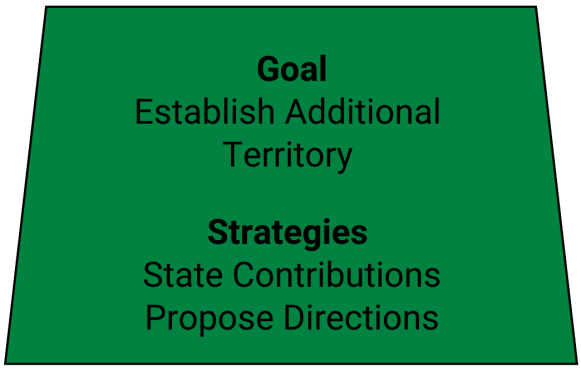
Let us review the strategies for *Frame Principal Findings*. This Goal is used to comment on and frame the results, and establish their meaning in the context of the study and possibly in relation to existing knowledge in the field. The results are discussed through comparisons, explanations, interpretations, and relevant deliberations that go just beyond the "objective" results. You may achieve this Goal using any of the following strategies:

- *Compare Results* with literature is used to relate the results with reported empirical findings, theoretical beliefs, and/or previously made assumptions or predictions.
- *Explain Results* alludes to why the results occur, what the results seem to mean, or how the results relate to expectations. The Sub-strategies are *Account for the Results, Explicate the Results,* and *Relate to Expectations*.
- *Acknowledge Limitations* notifies readers of any limitations or shortcomings that the study might have.

Taken together, it is important that results are not over-interpreted, meaning that the recommendations or meaning does not stretch beyond the data. Conclusions should not contradict the data presented in the Results. To avoid this, consider highlighting the principal findings that support conclusions prior to or while discussing the meaning of the findings within the field.

WRITING STRATEGIES FOR ESTABLISH ADDITIONAL TERRITORY

When concluding your research story, one of the final Goals you may decide to utilize is *Establish Additional Territory.* Represented by the color GREEN, this Goal is used to show new developments and growth in the field. Potentially, these final notes about the study represent your take-home messages for the reader. The Strategies to achieve this Goal may be part of a Discussion section, of a combined Discussion/Conclusion section, or of a separate Conclusion. They include **State Contributions** and **Propose Directions**.



Strategies for Achieving Goal - *Establish Additional Territory*

WRITING STRATEGY: STATE CONTRIBUTION(S)

When you *State Contributions*, you illustrate the noteworthiness of the study by demonstrating valuable findings or implications. This Strategy enables researchers to advocate for the importance of the results and/or of the study. There are three Sub-strategies for stating contributions:

- **Generalize Results**, or infer from results and to develop general claims and/or conclusions
- **Note Implications**, or present theoretical, empirical, practical, or methodological applications or recommendations
- **State General Value**, or situate the novelty of the study within general claims of importance or significance.

Generalizing Results means to infer from results and to develop general claims and/or conclusions, often by summarizing/synthesizing the results and/or making deductions. This Strategy further allows us to broaden the scope of specific results, to expand the meaning of the principal findings outside the framework of the study and to deliberate on the generalizability, transferability, reliability, or validity of the results. Of course, not all research is generalizable. This will be based on your research design and the strength of your overall findings. In general, you can describe how the outcomes of your research are connected to broader concepts or knowledge on a particular subject. Here is an example:

- *"**The study thus indicates that there is a** considerable heterogeneity **among** graduate student **populations**."*

The example takes the study as a whole and generalizes to other graduate student "populations" outside the study.

Noting Implications is another Sub-strategy of *State Contribution* that is used to inform the reader of potential implications of results. Thus, we can explain how the results could be applied more broadly to research, practice, theory, or methodology; show the larger impact of the results and/or of the study; and notify readers of possible consequences. Here's an example:

- *"Therefore, **these findings might be of particular importance for** interventions aimed at reducing self-conscious emotions when completing a high stakes research article."*

Notice that this sentence expresses some tentative language, "*might be of particular importance*," which is an example of **hedging**. When uncertainty may exist, researchers should acknowledge that others may disagree with your claims and choose tentative language accordingly. Other examples would include modal verbs, such as may, could, should, might.

Stating General Value is used to situate the novelty of the study within general claims of importance or significance. Statements of contribution should be explicit; do not leave your reader guessing what

the value and/or implications are. Besides, there would be a risk that readers may come to their own conclusion that no value or no implication exists at all. Let us look at an example of a value statement:

- *"Our study provides the **first ever empirical evidence of genre awareness** using the Dissemity platform."*

While this sentence may hold true, if you choose "*the first ever*," your understanding of the topic must be crystal clear. You will need to ascertain that your study is actually the first one that provides the mentioned empirical evidence. When there is a possibility that someone might disagree with you, you need to be careful of claiming something with a high degree of certainty.

In the following, you can see some language use patterns for the aforementioned Sub-strategies for *State Contribution*.

Generalize Results	**State Value**	**Note Implications**
• These conclusions can also be generalized to… • Overall, the data demonstrate/show that… • Taken together, these data demonstrate that… • In general, there is not a clear correlation between…	• This outcome points out … • These findings add value to existing research in a number of ways…	• This method can also be applied to… • Participation in …may also act as a springboard for … • …highlights the implications that … • The findings will therefore have serious implications for… • The results of this research can be applied.

WRITING STRATEGY: PROPOSE DIRECTIONS

Propose Directions can be used to make recommendations and/or suggest lines of future investigation. This Strategy can be further used to assert the need for future work that continues to address the targeted niche, to further contribute new knowledge to the field, and possibly to announce follow-up or on-going research by the same author/s. At this point, you might consider what new questions your study raises, what questions your study is unable to answer, and what avenues future research can take in your area of inquiry. *Future Directions* could also be discussed after presenting a general conclusion that emerged from the outcomes of your study. These recommendations for the future can be included in either the Discussion or Conclusion of your paper, but do not repeat your recommendations in both sections. Think about the overall narrative flow of your paper to determine where it is the best to locate this information. Here, you can see some Language Use patterns:

Propose Future Research

- Future research should examine…
- It would be fruitful to explore …
- More research regarding …is needed…
- Further research should pinpoint…
- In future implementations, …
- However, additional work is needed to …

SUMMARY: ESTABLISH ADDITIONAL TERRITORY

Let us recap the Goal of *Establish Additional Territory*. This Goal is used to expand beyond the principal findings and/or beyond the study specifics to discuss them within the broader context of the discipline. We may draw logical conclusions, evaluate the study, highlight the significance of the study, and/or recommend follow-up actions. There are two key Strategies that you may use to achieve this goal

- *State Contributions* is used to infer from results and to develop general claims and/or conclusions. Researchers can often do this by generalizing the results—by summarizing/synthesizing the results and/or making deductions that apply to a context outside of the present study. Contributions can also come in the form of implications which can inform the reader of potential applications or uses of the results, either theoretical, methodological, empirical, as well as practical. Stating the general value by demonstrating the noteworthiness of the study is also a way to show contributions.
- Finally, *Proposing Directions* is used to make recommendations and/or suggest lines of future investigations.

These final Strategies are arguably the most influential in expressing the overall relevance of the present study. Suggesting that the field has developed or grown because of the work conducted will help to solidify the importance of the study while bringing the manuscript full circle.

ACTIVITY: MODEL ARTICLE EXPLORATION

For each section of the research article, you will be completing a model article annotation task. This task can be done using results from your Choose a Model Article and Compile a Corpus. You can choose to complete the task using a web-based software called Dissemity that contains a set of tools and automated feedback for analyzing research and later writing your work. The steps below will take you through the completion of this task by using Dissemity, but this task can be completed using any annotation or highlighting tools.

The objective of this task is to:

- help you analyze your model article for Goals, Strategies, and Language Use,
- visualize the argument structure of a good example piece of writing,
- practice being a critical reader to inform your writing process, and
- identify Language Use patterns.

Here are the steps for completing this task:

Step 1. Go to https://dissemity.com/ and create an account to get started. Watch the video introduction for help.

Step 2. Upon login, go to the **ANALYZE** module.

Step 3. Paste your model article from your Choose a Model Article and Compile a Corpus activity. If you copy and paste from a PDF, the formatting will need to be cleaned up in Dissemity. Just make sure there are no line breaks in the middle of a sentence by editing the file after pasting.

Step 5. Click on the first sentence and then use the dropdown menu to determine what Goal and Strategy are utilized. Remember that one sentence may accomplish multiple Goals and/or Strategies, but you should choose the most prominent one. Alternatively, you can use highlights or a technology that allows you to highlight sentences (e.g., a PDF viewer) in different colors.

Step 6. Annotate the Introduction section based on what you have learned thus far. Your progress will save automatically in Dissemity. You can continue to annotate other articles in your corpus for additional practice and understanding of writing in your field. This is highly encouraged!

Step 7. Reflect on the following questions:

- Which Goals and Strategies seem to be most common in your field?
- Which Goals and Strategies seem to be least common, or nonexistent, in your field?
- What is the researcher trying to communicate through each Goal and Strategy?
- What have you learned from completing this task?

ACTIVITY: CORPUS EXPLORATION

For each section of the research article, you will be completing a corpus exploration task. Again, you can complete this task manually with your corpus of articles, or in Dissemity. You can submit Language Use patterns to Dissemity's **TOOLBOX** in the top right corner of Dissemity. You are going to focus on the **EXPLORE** module for this task, but the previous corpus annotation task may also be useful.

The objective of this task is to:

- discover how language helps to create meaning,
- explore explicit Language Use patterns that can make your communicative intent salient;
- help you form a language toolbox with patterns that can help you overcome writer's block.

Here are the steps for completing the task in Dissemity:

Step 1. Revisit the Model Article Annotation Activity and continue to explore your corpus of articles from the "Choose a Model Article and Compile a Corpus" activity. Search closely for Language Use patterns that help researchers communicate Goals and Strategies.

Step 2. Go to Dissemity and watch the Explore module tutorial for help.

Step 3. Go to the **EXPLORE** tab and search for some of the language patterns that you found in your model articles. For example, if you noticed the pattern heightened interest in your model to help *Claim Centrality*, you might search for "interest" in the **EXPLORE** module to see if additional patterns emerge.

Note: You should really shy away from using Language Use patterns from articles that you consider to be models because you want your writing to be distinct. You want to find your own voice and not mimic someone else's voice. Therefore, the next step is critical for discovering a range of language use patterns to help you express a similar communicative intent as the researchers in your model articles.

Step 4. Record your findings in Dissemity's TOOLBOX (found in the top right corner). You should find a minimum of three (3) templates per writing Strategy (e.g., three from *Claim Centrality*, three from *Provide Background*). If you cannot find any, that may be because your discipline does not use that strategy often. Just take note of this discipline-specific variation by adding a pattern that says "Not found in my discipline" rather than adding a language template.

Note: We are not looking for full sentences. We are looking for Language Use patterns that are not discipline specific and can be used across all disciplines. For example, we are looking for #1 below but not #2.

1. have been of increased **interest in** (YES)
2. These subcomponents of language performance have been of increased **interest in second language** development. (NO)

CHAPTER VI

CHAPTER SIX: WRITING THE RESEARCH ABSTRACT

The research Abstract is an indispensable part of any research article. An abstract is typically placed in the beginning pages of an article before the Introduction section, and you might wonder why we discuss it here as the final stage of your writing. The reason is simple; you would not be able to write a functional abstract without knowing your findings and their implications first. In this final chapter, we discuss the five important stages in the process of writing an Abstract. To do so, we first help you read and analyze abstracts from your own field to learn more about the conventions of your field by way of comparison. More specifically, we draw your attention to the word choice and grammatical features used in your field to write an Abstract as a way to help you implement your findings from the analysis stage in your own research Abstract. In what follows, we first introduce the purpose of the Abstract and its typical format, as well as the strategies used to write a succinct Abstract for your research. Before we proceed, here are some questions for you to consider:

- *Why are Abstracts important?*
- *What kind of information do you expect to see when you read an Abstract?*
- *What makes an Abstract ineffective?*

The Purpose

An Abstract performs several functions:

1. it provides a stand-alone synopsis of one's research that includes short accounts of study topic, methods and findings;
2. it helps researchers as a filtering and screening device for when they look for publications in their desired research areas to save their time;
3. it may be used as a tool to clarify the structure of the article and help interested readers to better navigate when read the entire article; and
4. it can be used as an indexing tool by journals and editors who publish the abstract, along with the associated research (Huscin, 2001; Swales & Feak, 2009).

In the context of publication, an Abstract helps reviewers by giving them a quick overview of your research (Swales & Feak, 2009). It is fair to say that Abstract is the very first section of an article that

leaves the first impression on your reader. Therefore, it would be important to familiarize yourself with common Abstract writing conventions in your fields so that you can achieve the desired impression on your audience.

Abstracts might be written in structured or traditional ways. Both ways are in fact structured, but they slightly differ in the way they are formatted. In this chapter, we mainly investigate traditional Abstracts. The traditional Abstract is varied in length as measured by word count. For example, most fields in science demand an abstract that ranges from 150 to 250 words. In humanities fields, such as in Applied Linguistics, the word count might exceed this range, and at times, we see abstracts that are 500 words long.

The Format

As mentioned above, the primary purpose of an Abstract is to provide a summary or a synopsis of your research. To be able to condense your research in a limited space and yet leave the desired impression on your reader, usually a set of communicative goals are achieved in a traditional Abstract. Irrespective of disciplinary differences, most traditional Abstracts briefly describe the current knowledge on the topic of the research, the importance of that topic, the specific focus of the current research, an account of how the research was carried out, the discoveries and meaning of those discoveries for the audience. You might wonder how all or majority of these communicative goals can be achieved in a limited space. Indeed, a source of struggle in writing Abstracts originates from the same space and structuring issue. All these goals mimic the formatting of an entire article, but in a very small space. In the continuation of this chapter, we provide you with the set of goals to be achieved in an Abstract and offer you strategies and language samples that can be used to communicate those goals. We also present a sample analysis of the Abstracts in your fields as the primary way to learn about what language to use and how to structure concise sentences.

GOALS, STRATEGIES AND LANGUAGE USE IN ABSTRACTS

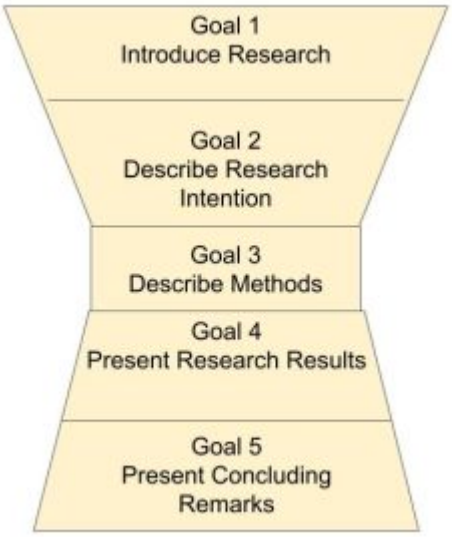
Sara Nezami Nav

In the previous section, we briefly discussed the overall goals that researchers try to achieve in an Abstract, such as presenting the current knowledge on the topic of research or presenting study discoveries. Here, we first delineate the **Goals** of Abstract writing, and next we will explore the **Strategies** that are used to achieve those goals. We will also show some sample **Language Use** in Abstracts to implement the strategies and realize the overall goals. To learn those strategies, we invite you to take a similar approach to other chapters in this book and start with a preliminary sample analysis and examination. As stated in the previous chapters of the book, the key to writing an academically plausible Abstract is to read published samples and analyze those to learn about what strategies their authors have used to hone and develop a scholarly Abstract. Once more, we remind you that a preliminary analysis and reading of scholarly samples of Abstracts prior to writing your own is a dual-purpose process whereby you not only gain information about the new research but learn the lexico-grammatical features and formatting conventions of Abstract writing in your fields. In what follows we will describe the overall goals and their formatting, the strategies and the lexico-grammatical features that can be found in Abstracts.

- *There are Five goals that an Abstract can achieve. What do you think they are?*
- *What common language expressions (e.g., recent research has investigated...) do you think can be found in each goal? Why are these expressions important? What verb tense do you think is used in an Abstract?*

Communicative Goals and Strategies in Abstracts

We have merged the discussion of goals and strategies that are used to fulfill goals here since they had been discussed under the various chapters of the book extensively. The traditional Abstract mirrors some of the important moves and strategies of the main sections of a research, albeit in a very condensed way. There are five goals that must be achieved for an effective Abstract. These goals include: **Introduce Research, Describe Research Intention, Describe Methods, Present Research Results,** and **Present Concluding Remarks**. In the next sections, we will go over each of these Goals and present the Strategies and Language Use in order to fulfill each Goal.



GOAL ONE: INTRODUCE RESEARCH

Sara Nezami Nav

This Goal in an Abstract is to introduce the general topic of the research. It usually starts with telling the reader what the general topic is and sets the **Background** for the research. To do so in a concise way, it is important to consolidate the Strategies **Introduce the General Research Area**, **Introduce the Problem** and **Introduce the Gap in Knowledge** in a few sentences. You do have the choice of what to mention in your Abstract and what to leave out. However, the most important points must be included to fulfill this goal, while also avoiding too many details. If you remember, a version of this goal was a part of the research Introduction section, and now is condensed to the very main points of the Introduction, communicated via a few sentences. Below, you can see an example of the opening sentences in an Abstract from the field of mechanical engineering and food service, where the researchers have fulfilled this first Goal:

> "The spontaneous formation of cracks in biscuits following baking, also known as checking, is an issue that manufacturers would like to be able to predict and avoid. Unfortunately, the mechanisms driving this phenomenon are not well understood" (example borrowed from Swales & Feak, 2009, p. 7).

- *After reading the example above, what strategies do you think the authors have utilized to introduce their research?*
- *What words did help you identify the strategies?*
- *What are the verb tenses used to introduce the research?*

GOAL TWO: DESCRIBE RESEARCH INTENTION

Sara Nezami Nav

Describing your Study Focus, Describing Study Purpose and **Describing Study Intentions** is a common component of an Abstract. Realizing this Goal will help the readers to have an immediate grasp of what the study is about and what the exact intentions of your study are. Depending on the space available for your Abstract, you can either have a separate sentence devoted to the study intention or merge the intention with study methods.

It would be helpful to clarify some points about the first two goals in the Abstracts here. The two goals are usually the opening sentences of an Abstract. Sometimes, authors start with the statement of purpose or adjective. However, if the purpose is to start with a brief background, then they might start with the description of real-world phenomenon or standard practice, researchers' actions such as in " We analyze corporate taxation returns...", and/or a problem or uncertainty in the area of research (Swales & Feak, 2009; p. 10). Ultimately, it depends on the conventions of your field and your topic of research which to choose.

As we stated above, it may be typical to start an Abstract with describing the research intention right away. For example, in the opening section of the Abstract below, you can see that the authors have started the sample with the purpose and objective statement:

"The object of this study was to evaluate postpartum IN women for psychiatric symptomatology including cognitive disturbances, anxiety, depression, and anger to better meet their needs for support and involve them in the care of their infants. We interviewed 52 postpartum mothers at the Bronx Lebanon Hospital Center within 5 days of delivery..." (example borrowed from Swales & Feak, 2009, p. 9).

- *What words did help you identify the purpose?*
- *What verb tense is used to state the purpose?*

GOAL THREE: DESCRIBE METHODS

Sara Nezami Nav

Describing Methods in an Abstract is one of the important goals to be achieved in writing a research Abstract. *Methods* in an Abstract can be a few sentences long, or can be short and merged with the previous goals like describe study intentions to save space. The same strategies that have been used for study Methods as a section of an article can be used to give a brief account of Methods in an Abstract. For example, you may choose to include Information about **Study Subjects, Materials, the Data Collection Procedures, the Analytical Procedures, the Design of the Research**, and so on. However, they are only briefly introduced, and should include only the main points. For example, you may choose to describe the number of participants, but leave out some details about demographic information. Ultimately, you have to decide which information is the most important information to be included. We suggest you compare the description of the Methods in an Abstract of a research article with the actual Methods section of the same research. This comparison will give you a clear idea of what to include and what not to include in your own Abstract. *Describing Methods* is a very important component of an Abstract and leaving it out will confuse the readers at best and leave a wrong first impression on them. This is why we consider *Describe Methods* to be an indispensable component of an effective Abstract. Please see the following versions of the same abstract (borrowed from Swales & Feak, 2009, pp.14-15):

Version A: *"The primary data used consist of approximately 300 memoranda (internal correspondence) and 150 fax messages (external correspondence) associated with four different Turkish companies selected to represent a range of sectors, sizes and management styles. Analysis of the primary data was supported by interviews with executives from these four companies."*

Version B: *"The primary data consist of internal and external correspondence (faxes) from four very different Turkish companies. Secondary data comes from interviews with selected executives."*

- *What details have been eliminated from the first version? Why do you think they have been eliminated?*
- *What verb tense is used to Describe the Methods?*

GOAL FOUR: PRESENT RESEARCH RESULTS

Sara Nezami Nav

When it comes to **Presenting Research Results**, one must represent the very main discoveries, findings and outcomes of their study. The *Present Research Findings* Goal is as important as *Describing Study Intentions* and *Describe Methods*, without which the Abstract will not draw the readers in. However, researchers always run the risk of presenting their findings in a detailed manner that takes away space from other components of an Abstract. To avoid this, it is important to know what the principal outcomes of your research are. The inclusion of the main findings must eventually persuade readers to read your article and know more. You must be cautious, however, that you do not bog readers down with unnecessary details while cutting out other important sections from your Abstract. In general, there are three important formatting and language use features that you may frequently find in presenting research results in Abstracts; the presentation of general findings and moving towards more specific findings using words such as *specifically*; the sequencing of the main findings using listing words such as f*irst, second, third, last* and so on; and/or describing the most important findings by using words such as *significantly* (Swales & Feak, 2009).

- *Compile several research Abstracts from your own field; Do you see any of the three strategies above used in them? What findings and how are presented in those samples?*
- *What verb tense is used to present the research findings?*

GOAL FIVE: PRESENT CONCLUDING REMARKS

Sara Nezami Nav

The very last goal of an Abstract is to **Present Concluding Remarks**. Although many people devote few sentences to this last goal, the fulfillment of this goal is not as necessary as the other goals in an Abstract. Depending on the nature of your research, you can wrap up your Abstract by a brief **Discussion of your Findings**, the main **Conclusions** of the study, the main **Implications** or **Applications of your Findings** and some **Recommendations**. Sometimes, *Present Concluding Remarks* can be only half a sentence long that is merged with *Present Research Results*.

The concluding section of an Abstract can be either descriptive or evaluative or a mixture of both. In other words, it is typical for the Abstracts that include a concluding section to briefly describe the meaning of findings, implication, applications as well as the recommendations drawn from the research. However, they might do so by merely describing those or assigning positive evaluations to those descriptions such as in "the findings strongly support the researchers' hypothesis regarding ....". Here, the word "strongly" adds an evaluative twist to the concluding statement. The positive evaluative tone here might leave a plausible impression on readers as was desired by their authors.

Now, let us do a mini analysis task. Please read the following sentence and determine if the concluding section is merely descriptive or evaluative?

1. We conclude that ecological niche modeling offers great potential for species delimitation. (Biology)
2. We provide assessment and treatment recommendations for care providers according to current clinical guidelines. (Psychology)
3. At the end, some pedagogical implications have been offered for EFL teachers and learners. (Applied Linguistics)
4. This paper also provides several remedial measures for improving the cold flow properties of biodiesel. (Engineering)
5. We show that detailed panel data are effectively unnecessary for estimating absolute mobility over the long run.

SUMMARY OF WRITING THE RESEARCH ABSTRACT

Sara Nezami Nav

Let's recap the chapter on Abstracts here:

1. Abstract typically include five goals of I*ntroduce Research, Describe Research Intention, Describe Methods, Present Research Results* and *Present Concluding Remarks*.
2. Depending on your field and discipline conventions, some of the goals such as *Introduce Research* and *Present Concluding Remarks* might be eliminated from the Abstract.
3. One major way to condense the Abstract is to condense each Goal and merge it with the Goals before and after.
4. The language used and the Strategies used to fulfill each of the five goals is similar to that used in the same sections of a research article.
5. The key to learning how to write an Abstract in your field is to do a model Abstract analysis. You will read more about this in the next section.

ACTIVITY: MODEL ABSTRACT ANNOTATION

The purpose of this annotation activity is to walk you through the sample analysis that is needed for learning the conventions of Abstract writing in your field and in your specific area of research within your field. We want you to:

1. Critically read sample Abstracts in your field and preferably close to your research interest.
2. Analyze the Abstracts with relation to the five goals discussed above.
3. Analyze the Abstracts with relation to the strategies used to fulfill the goals and the language use patterns.
4. Examine the strategies used to shorten and condense the goals in an Abstract.

To achieve the above purposes, you will need to do the following:

Step 1. Compile a corpus of at least seven scholarly research articles in your field and relevant to your area of interest in research if you have one.

Step 2. Tag and annotate the Abstract from sentence one by identifying the five goals discussed above. While doing so try to answer the following questions:

- What is the word limit required by journals for the Abstracts in your corpus?
- Do you see all the five goals in your abstracts? Which goals seem to be more common?
- Which goals are condense more than others and how?
- Do these goals appear with the same pattern that we introduced here? If not, what is the typical pattern?
- What language patterns or words can help you identify the goals and strategies used in each goal?
- Are the verb tenses the same in all the five goals?
- Are first person pronouns common in your Abstracts, or third person to express researcher's actions? Are any of the goals presented in passive form? What do you think is the reason?
- Do you see any transitional words (ex., however, therefore) and conjunctions (ex., and, as well as. But. albeit)? Have they helped with condensing the goals in an abstract? How?
- Are citations and acronyms or abbreviations common?

Step 3. Reflect back and see if the analysis above and the answers you have provided for each of the questions, have helped you gain a new understanding of the Abstract writing conventions in your field.

As was stated in previous chapters of the book, the purpose of such analysis is to learn the overall conventions of research writing in your discipline. However, you must be careful that you do not follow the language patterns and structural features of the sample articles blindly and in a robotic way. For example, it would be super important to find the possible synonyms that could be used for some of the words that you saw in your sample. You will need to critically gauge and see if you would like to choose passive or active in some of the sentences and why. You may follow the regulations such as inclusion of citations or abbreviations as well as inclusion of some goals in abstract as is typical in your field. However, when it comes to language use , you must learn how to come up with your own word choice and sentence structure in an abstract while staying within the conventions of your field. You will own your writing style after practicing with options and within the restrictions and conventions of your field.

ABOUT THE AUTHOR

Dr. Stephanie Link

Associate Professor and Graduate College Faculty Fellow, Dr. Stephanie Link, utilized her unique upbringing and academic preparation as motivating factors in her career success. Being a first-generation Asian-Cuban American and first-generation college student, Dr. Link used her life-long struggles with academic language to create opportunities for future generations. She found a way of making a messy writing process manageable by introducing students to tools for finding their researcher identity through writing.

Completing her PhD in Applied Linguistics and Technology at Iowa State University in May 2015, Dr. Link rolled right into a faculty position at OSU later that same year. Upon arrival, she noticed a gap between what was available to emerging scientific writers and what she had to offer based on her lived experiences and research interests. This sparked a great interest in creating unique opportunities that assist graduate students with writing for publication. By her second semester at OSU, Dr. Link had begun implementing these ideas in the form of workshops in collaboration with the Graduate College, Writing Center, and OSU Library.

ABOUT THE EDITORS

Dr. Sara Nezami Nav joined ELI at the University of Michigan as a Lecturer III in August 2022. She teaches academic writing and research writing courses to international graduate students and serves as a consultant for Graduate Writing and Speaking Clinics.

Sara believes that teaching and research go hand in hand. Her research interests revolve around discourse analysis of academic and occupational genres taking both ESP (English for Specific Purposes) and multimodal analysis approaches. She is particularly interested in the multimodal discourse analysis of the recently developed digital genres for the specific purpose of communicating science to a wider audience. Sara is passionate about advancing graduate students' knowledge of these new research disseminating genres as well as the use of popularization strategies in them to help these emerging scholars make their research findings more accessible especially in STEM fields

Mx. Hann Bingham Brunner, MA is a PhD candidate in Applied Linguistics and Rhetoric at Oklahoma State University with a focus in disability studies. They are an Assistant Director of the International Composition program, as well as an Assistant Director for First-Year Writing (Freshman Composition), and instructor for courses such as Critical Writing and Analysis II: Disability Justice and Accessibility. Their work focuses on disability and identity, and the ways that these intersect with chronic illness, neurodivergence, and chronic pain. They are the recipient of the Carol G. Preston Award for Social Justice Research (2022), the Gene Halleck award for Teaching Excellence (2021) and the EQuAl (Employee Queers and Allies) scholarship (2020).